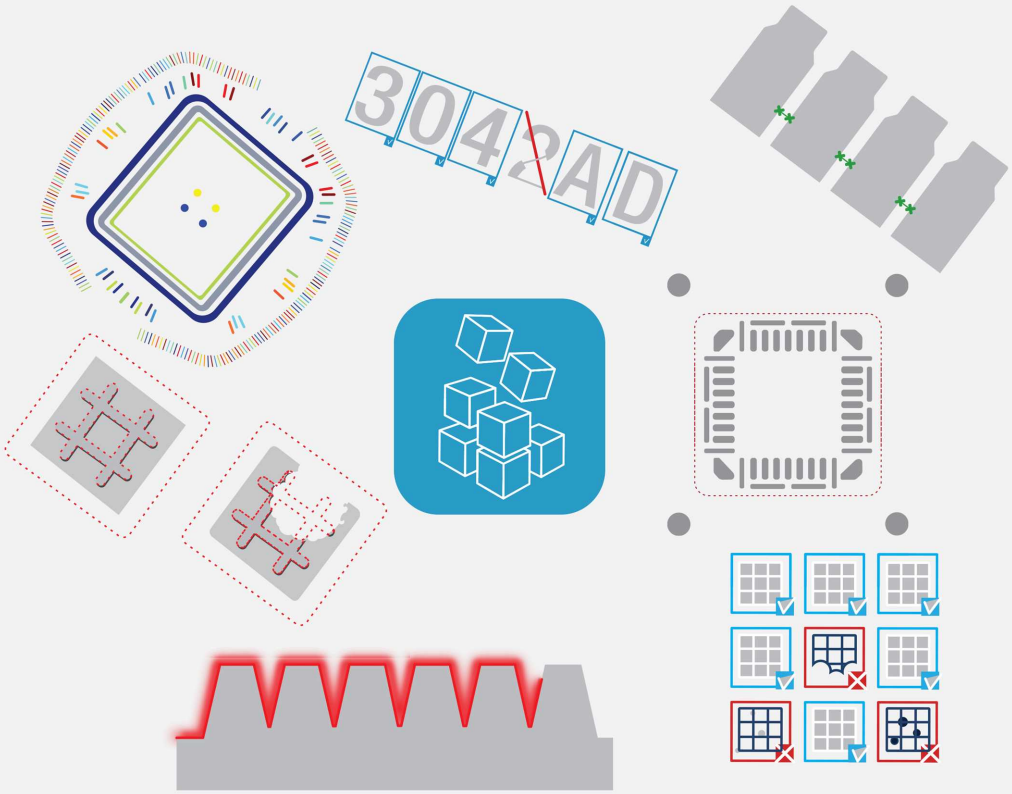
euresys
Empowering Computer Vision

REFERENCE MANUAL

Open eVision



This documentation is provided with **Open eVision 24.02.0** (doc build **1197**).
www.euresys.com

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-

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Methods

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SetPixel	-

EBW8PixelAccessor.EBW8PixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void EBW8PixelAccessor(
 Euresys.Open_eVision_1_2.EROIBW8 roi
 )
```

Parameters

roi

-

EBW8PixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
byte GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EBW8PixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void SetPixel(
 byte value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

1.2. EBW16PixelAccessor Class

-

Namespace: Euresys::Open_eVision_1_2

Methods

EBW16PixelAccessor	-
GetPixel	-
SetPixel	-

EBW16PixelAccessor.EBW16PixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

[C#]

```
void EBW16PixelAccessor(
   Euresys.Open_eVision_1_2.EROIBW16 roi
)
```

Parameters

roi

-

EBW16PixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

[C#]

```
ushort GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EBW16PixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

[C#]

```
void SetPixel(
 ushort value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

1.3. EBW32PixelAccessor Class

-

Namespace: Euresys::Open_eVision_1_2

Methods

EBW32PixelAccessor	-
GetPixel	-
SetPixel	-

EBW32PixelAccessor.EBW32PixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void EBW32PixelAccessor(
 Euresys.Open_eVision_1_2.EROIBW32 roi
 )
```

Parameters

roi

-

EBW32PixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
int GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EBW32PixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void SetPixel(
 int value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

1.4. EC15PixelAccessor Class

-

Namespace: Euresys::Open_eVision_1_2

Methods

EC15PixelAccessor	-
GetPixel	-
SetPixel	-

EC15PixelAccessor.EC15PixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void EC15PixelAccessor(
 Euresys.Open_eVision_1_2.EROIC15 roi
 )
```

Parameters

roi

-

EC15PixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
Euresys.Open_eVision_1_2.EC15 GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EC15PixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void SetPixel(
 Euresys.Open_eVision_1_2.EC15 value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

1.5. EC16PixelAccessor Class

-

Namespace: Euresys::Open_eVision_1_2

Methods

EC16PixelAccessor	-
GetPixel	-
SetPixel	-

EC16PixelAccessor.EC16PixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void EC16PixelAccessor(
 Euresys.Open_eVision_1_2.EROIC16 roi
 )
```

Parameters

roi

-

EC16PixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
Euresys.Open_eVision_1_2.EC16 GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EC16PixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void SetPixel(
 Euresys.Open_eVision_1_2.EC16 value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

1.6. EC24APixelAccessor Class

-

Namespace: Euresys::Open_eVision_1_2

Methods

EC24APixelAccessor	-
GetPixel	-
SetPixel	-

EC24APixelAccessor.EC24APixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void EC24APixelAccessor(
 Euresys.Open_eVision_1_2.EROIC24A roi
 )
```

Parameters

roi

-

EC24APixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
Euresys.Open_eVision_1_2.EC24A GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EC24APixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void SetPixel(
 Euresys.Open_eVision_1_2.EC24A value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

1.7. EC24PixelAccessor Class

-

Namespace: Euresys::Open_eVision_1_2

Methods

EC24PixelAccessor	-
GetPixel	-
SetPixel	-

EC24PixelAccessor.EC24PixelAccessor

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void EC24PixelAccessor(
 Euresys.Open_eVision_1_2.EROIC24 roi
 )
```

Parameters

roi

-

EC24PixelAccessor.GetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
Euresys.Open_eVision_1_2.EC24 GetPixel(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EC24PixelAccessor.SetPixel

-

Namespace: Euresys::Open_eVision_1_2

```
[C#]
void SetPixel(
 Euresys.Open_eVision_1_2.EC24 value,
 int x,
 int y
 )
```

Parameters

value

-

x

-

y

-

2. Common

2.1. Easy Class

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Image Classes

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4. Classes

4.1. E3DAligner Class

Aligns an EPointCloud or EZMap on a reference EMesh, EPointCloud or EZMap.

Derived Class(es):E3DMatcher
Namespace: Euresys.Open_eVision.Easy3D

Properties

ScanReprojectionPlane	Sets/Gets the plane on which the model lays. This is used to re-project the scans before trying to find the position of the object within them. The E3DPlane should lay slightly below/above (depending on the orientation of the normal) the real plane, so that all points of the real plane are reprojected in the new ZMap.

Methods

Align	Aligns an EZMap or EPointCloud on the reference model.
ClearReprojectionPlane	Clears re-projection plane set with E3DAligner::ScanReprojectionPlane or E3DAligner::SetFlatScan.
E3DAligner	Constructs a 3D Aligner.
IsReprojectionPlaneSet	Returns whether a re-projection plane was set with E3DAligner::ScanReprojectionPlane or E3DAligner::SetFlatScan or not.
Load	Loads the E3DAligner. The given ESerializer must have been created for reading.
operator=	Assignment operator.
RetrieveReferencePoses	Retrieves the reference poses of the E3DAligner in the form of a vector of E3DPlane. The corresponding reference patterns vector can be retrieved with E3DAligner::RetrieveReferencePosesProjections.
RetrieveReferencePosesProjections	Retrieves the reference patterns of the E3DAligner in the form of a vector of EZMap8. The corresponding reference poses vector can be retrieved with E3DAligner::RetrieveReferencePoses.
Save	Saves the E3DAligner. The given ESerializer must have been created for writing.
SetFlatScan	Uses a flat scan of the setup to compute the plane on which the object lays. This helps computing alignment when the sensor does not lay on top of the objects.
SetReference	Sets the 3D reference model that is used to create reference patterns. It may be a CAD of the object as an EMesh with reference plane(s) on which they must be projected to roughly correspond to the face visible in the scans. In that case, when a scan re-projection plane is set (E3DAligner::ScanReprojectionPlane, E3DAligner::SetFlatScan), the reference plane(s) set by this method should correspond to the scan's re-projection plane. It may also be a golden scan represented by an EZMap or an EPointCloud with reference plane indicating on which direction it must be projected.

E3DAligner.Align

Aligns an EZMap or EPointCloud on the reference model.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAlignment Align(
 Euresys.Open_eVision.Easy3D.EZMap zmap
 )
Euresys.Open_eVision.Easy3D.E3DAlignment Align(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.E3DPlane projectionPlane
 )
Euresys.Open_eVision.Easy3D.E3DAlignment Align(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 float azimuth,
 float elevation
 )
```

Parameters

zmap

The EZMap to align

cloud

The EPointCloud to align on the reference

projectionPlane

The E3DPlane on which the cloud is orthographically projected.

azimuth

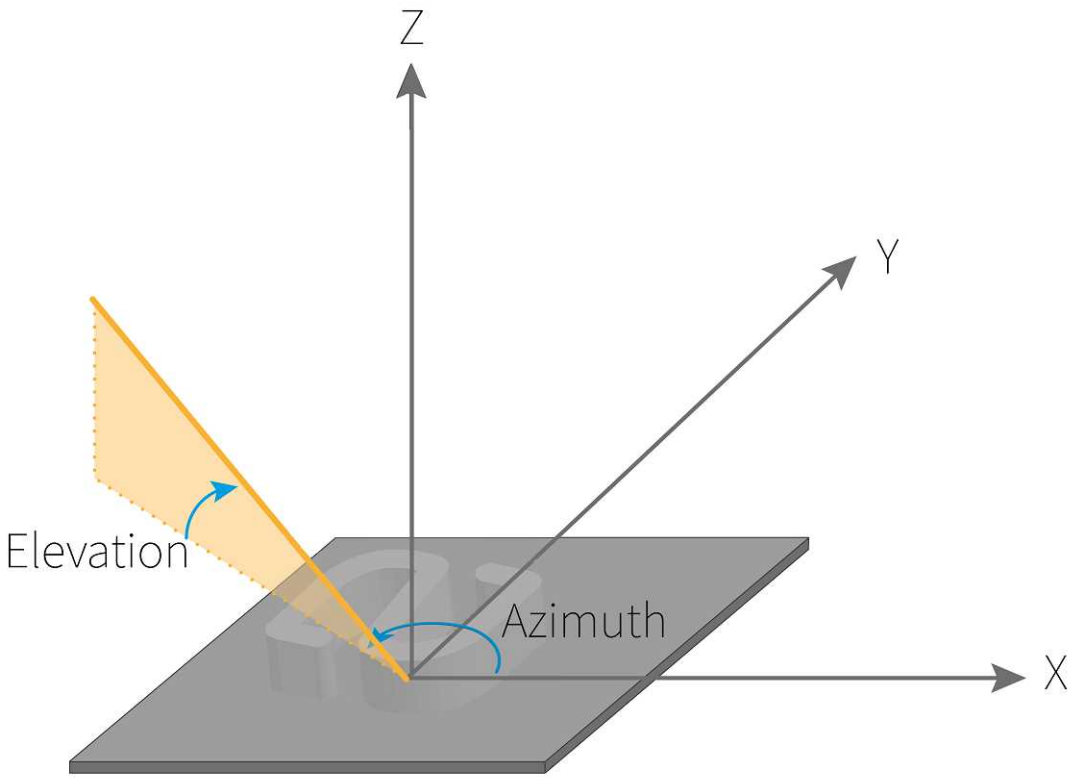
The azimuth angle of the normal of the projection plane in Easy::AngleUnit. Azimuth angles are oriented trigonometrically around the z axis. The x axis corresponds to an azimuth of 0 degrees.

elevation

The elevation angle of the normal of the projection plane in Easy::AngleUnit. Elevation angles represent how close the normal is to the z = 0 plane.

Remarks

When specifying azimuth and elevation, only the normal of the projection plane is specified. The distance from origin of the E3DPlane will be computed from the points cloud, so that all points of the cloud are visible. This might not be wanted if there are points in the cloud that are useless for the process (e.g. if we see other objects far below the model). This is also a bit slower as the plane's distance is recomputed on each scan.



E3DAligner.ClearReprojectionPlane

Clears re-projection plane set with E3DAligner::ScanReprojectionPlane or E3DAligner::SetFlatScan.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearReprojectionPlane(
 )
```

E3DAligner.E3DAligner

Constructs a 3D Aligner.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DAligner(
 )
void E3DAligner(
 Euresys.Open_eVision.Easy3D.E3DAligner other
 )
```

Parameters

other

Another E3DAligner object to be copied in the new E3DAligner object.

E3DAligner.IsReprojectionPlaneSet

Returns whether a re-projection plane was set with E3DAligner::ScanReprojectionPlane or E3DAligner::SetFlatScan or not.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsReprojectionPlaneSet(
 )
```

E3DAligner.Load

Loads the E3DAligner. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DAligner.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAligner operator=(
 Euresys.Open_eVision.Easy3D.E3DAligner other
 )
```

Parameters

other

The E3DAligner object that should be assigned.

E3DAligner.RetrieveReferencePoses

Retrieves the reference poses of the E3DAligner in the form of a vector of E3DPlane. The corresponding reference patterns vector can be retrieved with E3DAligner::RetrieveReferencePosesProjections.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void RetrieveReferencePoses(
 out Euresys.Open_eVision.Easy3D.E3DPlane[] referencePoses
 )
```

Parameters

referencePoses

The vector that will be filled with copies of the reference poses

E3DAligner.RetrieveReferencePosesProjections

Retrieves the reference patterns of the E3DAligner in the form of a vector of EZMap8. The corresponding reference poses vector can be retrieved with E3DAligner::RetrieveReferencePoses.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void RetrieveReferencePosesProjections(
 out Euresys.Open_eVision.Easy3D.EZMap8[] referencePosesProjections
 )
```

Parameters

referencePosesProjections

The vector that will be filled with copies of the reference poses projections

E3DAligner.Save

Saves the E3DAligner. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DAligner.ScanReprojectionPlane

Sets/Gets the plane on which the model lays. This is used to re-project the scans before trying to find the position of the object within them. The E3DPlane should lay slightly below/above (depending on the orientation of the normal) the real plane, so that all points of the real plane are reprojected in the new ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPlane ScanReprojectionPlane
  { get; set; }
```

Remarks

When the sensor is not directly on top of the object, setting the re-projection plane will improve results, you can also give a flat scan on which the normal of the plane is identified automatically, see E3DAligner::SetFlatScan. When the reference is a EMesh, the corresponding reference plane should match the re-projection plane.

E3DAligner.SetFlatScan

Uses a flat scan of the setup to compute the plane on which the object lays. This helps computing alignment when the sensor does not lay on top of the objects.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetFlatScan(
 Euresys.Open_eVision.Easy3D.EZMap scan
 )

void SetFlatScan(
 Euresys.Open_eVision.Easy3D.EZMap scan,
 bool objectAbovePlane
 )

void SetFlatScan(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud
 )

void SetFlatScan(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 bool objectAbovePlane
 )
```

Parameters

scan

The EZMap representing a scan of the setup when no object lays on it.

objectAbovePlane

Whether the object to align lays above or below the plane of the scan. To project the object, we must not only know the plane but also if we must project the points above or below it. The object is said to lay above the plane, if, for a given (x, y), z(object) > z (plane). Default: true

cloud

The EPointCloud representing a scan of the setup when no object lays on it.

Remarks

When the sensor is not directly on top of the object, setting the plane improves the results, you can also give the plane coordinates directly, see E3DAligner::ScanReprojectionPlane. When the reference is a EMesh, the corresponding reference plane should match the re-projection plane.

E3DAligner.SetReference

Sets the 3D reference model that is used to create reference patterns. It may be a CAD of the object as an EMesh with reference plane(s) on which they must be projected to roughly correspond to the face visible in the scans. In that case, when a scan re-projection plane is set (E3DAligner::ScanReprojectionPlane, E3DAligner::SetFlatScan), the reference plane(s) set by this method should correspond to the scan's re-projection plane. It may also be a golden scan represented by an EZMap or an EPointCloud with reference plane indicating on which direction it must be projected.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetReference(
 Euresys.Open_eVision.Easy3D.EMesh mesh,
 Euresys.Open_eVision.Easy3D.E3DPlane plane
 )

void SetReference(
 Euresys.Open_eVision.Easy3D.EMesh mesh,
 float azimuth,
 float elevation
 )

void SetReference(
 Euresys.Open_eVision.Easy3D.EMesh mesh,
 Euresys.Open_eVision.Easy3D.E3DPlane[] planes
 )

void SetReference(
 Euresys.Open_eVision.Easy3D.EMesh mesh,
 float[] azimuths,
 float[] elevations
 )

void SetReference(
 Euresys.Open_eVision.Easy3D.EZMap zmap
 )

void SetReference(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.E3DPlane plane
 )

void SetReference(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 float azimuth,
 float elevation
 )
```

Parameters

mesh

The EMesh object that represents the 3D reference model.

plane

The plane onto which the model is projected orthographically (all points below the plane are discarded).

azimuth

The azimuth angle of the normal of the reference plane in Easy::AngleUnit. Azimuth angles are oriented trigonometrically around the z axis. The x axis corresponds to an azimuth of 0 degrees.

elevation

The elevation angle of the normal of the reference plane in Easy::AngleUnit. Elevation angles represent how close the normal is to the z = 0 plane.

planes

vector of planes

azimuths

vector of azimuths

elevations

vector of elevations

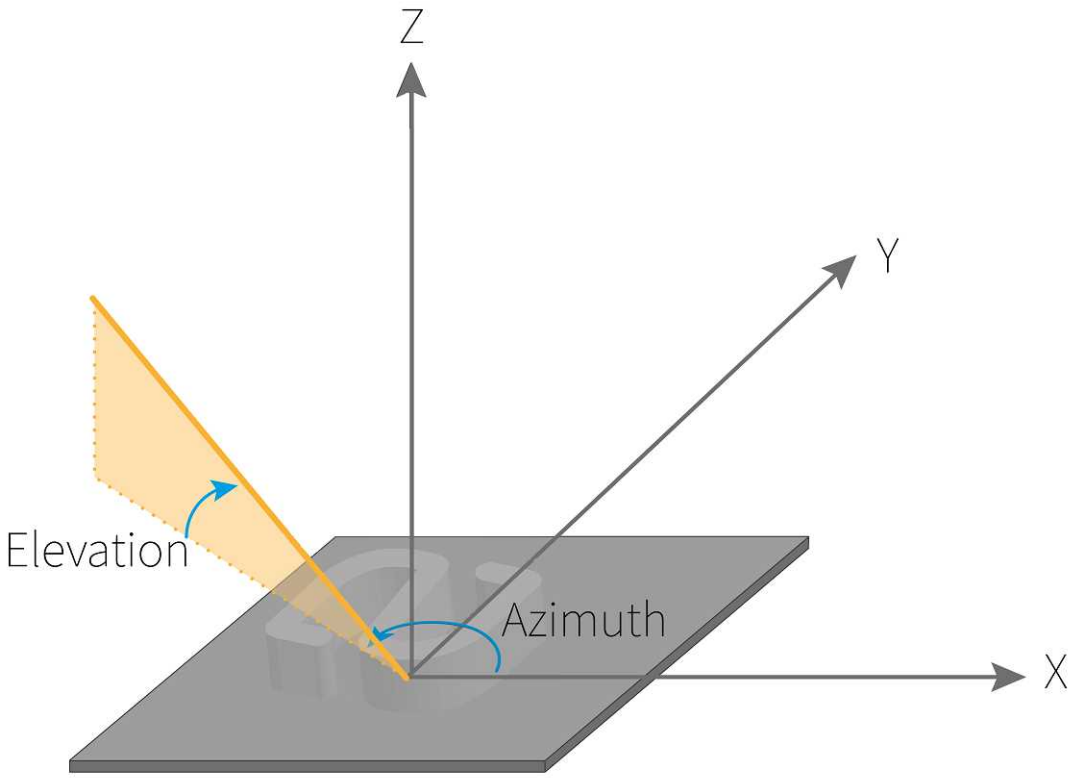
zmap

The EZMap object that represents a reference golden scan. The scan should only contain the object to align (the plane on which the points lay should be removed).

cloud

The EPointCloud object that represents a reference golden scan. The scan should only contain the object to align (the plane on which the points lay should be removed).

Remarks



4.2. E3DAlignment Class

Represents a 3D Alignment returned by E3DAligner.

Derived Class(es):E3DMatch

Namespace: Euresys.Open_eVision.Easy3D

Properties

Error	Gets the E3DAlignment error. The lower the error, the better the alignment. The error represents the average euclidean distance between the points of the reference and the scan without taking outliers into account.
Pose	Gets the pose of the E3DAlignment. The pose is an E3DTransformMatrix to apply to the scan to align it on the reference.
RefPoseMatchedIndex	Gets the reference pose index to which the scan was matched. These reference poses can be obtained by using E3DAligner::RetrieveReferencePosesProjections.

Methods

E3DAlignment	Constructs an E3DAlignment.
operator=	Assignment operator.

E3DAlignment.E3DAlignment

Constructs an E3DAlignment.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DAlignment(
 )
void E3DAlignment(
 Euresys.Open_eVision.Easy3D.E3DAlignment other
 )
```

Parameters

other

Another E3DAlignment object to be copied in the new E3DAlignment object.

E3DAlignment.Error

Gets the E3DAlignment error. The lower the error, the better the alignment. The error represents the average euclidean distance between the points of the reference and the scan without taking outliers into account.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Error
  { get; }
```

E3DAlignment.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAlignment operator=(
 Euresys.Open_eVision.Easy3D.E3DAlignment other
 )
```

Parameters

other

The E3DAlignment object that should be copied.

E3DAlignment.Pose

Gets the pose of the E3DAlignment. The pose is an E3DTransformMatrix to apply to the scan to align it on the reference.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Pose
  { get; }
```

E3DAlignment.RefPoseMatchedIndex

Gets the reference pose index to which the scan was matched. These reference poses can be obtained by using E3DAligner::RetrieveReferencePosesProjections.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int RefPoseMatchedIndex
  { get; }
```

4.3. E3DAnomaly Class

Represents a detected 3D anomaly.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Area	Gets the area of the E3DAnomaly.
BoundingBox	Gets the bounding box of the E3DAnomaly.
CenterOfGravity	Gets the center of gravity of the E3DAnomaly.
Cloud	Gets the EPointCloud containing the points belonging to the E3DAnomaly as well as their distance to the scan.

Methods

Create3DObject	Creates an E3DObject from the E3DAnomaly to render it in an E3DViewer. This method is deprecated, you can now retrieve the bounding box with E3DAnomaly::BoundingBox and display it directly in the E3DViewer.
E3DAnomaly	Constructs an E3DAnomaly.
operator=	Assignment operator.

E3DAnomaly.Area

Gets the area of the E3DAnomaly.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Area
  { get; }
```

E3DAnomaly.BoundingBox

Gets the bounding box of the E3DAnomaly.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DBox BoundingBox
  { get; }
```

E3DAnomaly.CenterOfGravity

Gets the center of gravity of the E3DAnomaly.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint CenterOfGravity
  { get; }
```

E3DAnomaly.Cloud

Gets the EPointCloud containing the points belonging to the E3DAnomaly as well as their distance to the scan.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPointCloud Cloud
  { get; }
```

E3DAnomaly.Create3DObject

This method is deprecated.

Creates an E3DObject from the E3DAnomaly to render it in an E3DViewer. This method is deprecated, you can now retrieve the bounding box with E3DAnomaly::BoundingBox and display it directly in the E3DViewer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DObject Create3DObject(
 )
```

E3DAnomaly.E3DAnomaly

Constructs an E3DAnomaly.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DAnomaly(
 )

void E3DAnomaly(
 Euresys.Open_eVision.Easy3D.E3DAnomaly other
 )
```

Parameters

other

Another E3DAnomaly object to be copied in the new E3DAnomaly object.

E3DAnomaly.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAnomaly operator=(
 Euresys.Open_eVision.Easy3D.E3DAnomaly other
 )
```

Parameters

other

The E3DAnomaly object that should be copied.

4.4. E3DAxisDisplay Class

Represents the axis and the grid to display in the E3DViewer.

Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisGraduationColor	Sets/Gets the axis graduation color.
AxisOrigin	Set and Get the axis origin mode.
AxisOriginUserDefined	Set and Get the axis origin.
AxisSize	Sets/Gets the size of each axis.
AxisXColor	Sets/Gets the color of the X axis.
AxisYColor	Sets/Gets the color of the Y axis.
AxisZColor	Sets/Gets the color of the Z axis.
GridColor	Sets/Gets the grid color.
RenderAxis	Enables or disables the display of the axis.
RenderGrid	Enables or disables the display of Grid.
RenderGridStep	Sets/Gets the grid step of each axis.

Methods

E3DAxisDisplay	Creates an E3DAxisDisplay object.
operator=	Assignment operator.
operator==	Comparison operator.

E3DAxisDisplay.AxisGraduationColor

Sets/Gets the axis graduation color.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.ERGBColor AxisGraduationColor
  { get; set; }
```

Remarks

The default color is white.

E3DAxisDisplay.AxisOrigin

Set and Get the axis origin mode.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EAxisOriginMode AxisOrigin
  { get; set; }
```

Remarks

The default mode is EAxisOriginMode.

E3DAxisDisplay.AxisOriginUserDefined

Set and Get the axis origin.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint AxisOriginUserDefined
  { get; set; }
```

Remarks

This function also sets the axis origin mode to EAxisOriginMode.

E3DAxisDisplay.AxisSize

Sets/Gets the size of each axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint AxisSize
  { get; set; }
```

Remarks

The unit is the same as the one from the EPointCloud. Default value is the size of EPointCloud rounded up.

E3DAxisDisplay.AxisXColor

Sets/Gets the color of the X axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERGBColor AxisXColor
  { get; set; }
```

Remarks

The default color is red.

E3DAxisDisplay.AxisYColor

Sets/Gets the color of the Y axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERGBColor AxisYColor
  { get; set; }
```

Remarks

The default color is green.

E3DAxisDisplay.AxisZColor

Sets/Gets the color of the Z axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERGBColor AxisZColor
  { get; set; }
```

Remarks

The default color is blue.

E3DAxisDisplay.E3DAxisDisplay

Creates an E3DAxisDisplay object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DAxisDisplay(
 )
void E3DAxisDisplay(
 Euresys.Open_eVision.Easy3D.E3DAxisDisplay other
 )
```

Parameters

other

Reference to the E3DAxisDisplay used for the initialization.

E3DAxisDisplay.GridColor

Sets/Gets the grid color.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERGBColor GridColor
  { get; set; }
```

Remarks

The default color is grey.

E3DAxisDisplay.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAxisDisplay operator=(
 Euresys.Open_eVision.Easy3D.E3DAxisDisplay other
 )
```

Parameters

other

The E3DAxisDisplay object that should be copied.

E3DAxisDisplay.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DAxisDisplay other
 )
```

Parameters

other

The E3DAxisDisplay object to compare with.

E3DAxisDisplay.RenderAxis

Enables or disables the display of the axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool RenderAxis
  { get; set; }
```

Remarks

The default state is true.

E3DAxisDisplay.RenderGrid

Enables or disables the display of Grid.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool RenderGrid
  { get; set; }
```

Remarks

Display Grid with true (true by default).

E3DAxisDisplay.RenderGridStep

Sets/Gets the grid step of each axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint RenderGridStep
  { get; set; }
```

Remarks

The unit of the grid step value is the same as the one from the EPointCloud. If value is equal to 0, then the step is auto computed and if the value is smaller than 0, then there is no step on the axis. Default value is the size of the EPointCloud rounded up and divided by ten.

4.5. E3DAxisSystem Class

Represent a 3D base axis system.

Derived Class(es):E3DOrthonormalAxisSystemE3DRightOrthonormalAxisSystem

Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisX	Gets the X axis.
AxisY	Gets the Y axis.
AxisZ	Gets the Z axis.
NormX	Gets the norm of the X axis.
NormY	Gets the norm of the Y axis.
NormZ	Gets the norm of the Z axis.
Origin	Gets the origin.

Methods

CheckIsNormal	check if axis system is Normed
CheckIsOrthogonal	check if axis system is Orthogonal
CheckIsRightHanded	check if axis system is Right
E3DAxisSystem	Constructs an E3DAxisSystem.
IsNormal	return true if this base axis system is Normed
IsOrthogonal	return true if this base axis system is Orthogonal
IsRightHanded	return true if this base axis system is Right Handed
Load	Load the E3DAxisSystem configuration. The given ESerializer must have been created for reading.
operator!=	-
operator=	Assignment operator.
operator==	operator comparison

Save	Save the E3DAxisSystem configuration. The given ESerializer must have been created for writing.

E3DAxisSystem.AxisX

Gets the X axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint AxisX
  { get; }
```

E3DAxisSystem.AxisY

Gets the Y axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint AxisY
  { get; }
```

E3DAxisSystem.AxisZ

Gets the Z axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint AxisZ
  { get; }
```

E3DAxisSystem.CheckIsNormal

check if axis system is Normed

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool CheckIsNormal(
 Euresys.Open_eVision.Easy3D.E3DPoint axisX,
 Euresys.Open_eVision.Easy3D.E3DPoint axisY,
 Euresys.Open_eVision.Easy3D.E3DPoint axisZ
 )
```

Parameters

axisX

-

axisY

-

axisZ

-

E3DAxisSystem.CheckIsOrthogonal

check if axis system is Orthogonal

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool CheckIsOrthogonal(
 Euresys.Open_eVision.Easy3D.E3DPoint axisX,
 Euresys.Open_eVision.Easy3D.E3DPoint axisY,
 Euresys.Open_eVision.Easy3D.E3DPoint axisZ
 )
```

Parameters

axisX

-

axisY

-

axisZ

-

E3DAxisSystem.CheckIsRightHanded

check if axis system is Right

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool CheckIsRightHanded(
 Euresys.Open_eVision.Easy3D.E3DPoint axisX,
 Euresys.Open_eVision.Easy3D.E3DPoint axisY,
 Euresys.Open_eVision.Easy3D.E3DPoint axisZ
 )
```

Parameters

axisX

-

axisY

-

axisZ

-

E3DAxisSystem.E3DAxisSystem

Constructs an E3DAxisSystem.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void E3DAxisSystem(
 )
void E3DAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DPoint Origin,
 Euresys.Open_eVision.Easy3D.E3DPoint axisX,
 Euresys.Open_eVision.Easy3D.E3DPoint axisY,
 Euresys.Open_eVision.Easy3D.E3DPoint axisZ
 )
void E3DAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DAxisSystem other
 )
```

Parameters

Origin

The origin of the axis system

axisX

The X axis

axisY

The Y axis

axisZ

The Z axis

other

Reference to another E3DAxisSystem used for the initialization.

E3DAxisSystem.IsNormal

return true if this base axis system is Normed

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsNormal(
 )
```

E3DAxisSystem.IsOrthogonal

return true if this base axis system is Orthogonal

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsOrthogonal(
 )
```

E3DAxisSystem.IsRightHanded

return true if this base axis system is Right Handed

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsRightHanded(
 )
```

E3DAxisSystem.Load

Load the E3DAxisSystem configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

E3DAxisSystem.NormX

Gets the norm of the X axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float NormX
  { get; }
```

E3DAxisSystem.NormY

Gets the norm of the Y axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float NormY
  { get; }
```

E3DAxisSystem.NormZ

Gets the norm of the Z axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float NormZ
  { get; }
```

E3DAxisSystem.operator!=

-

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator!=(
 Euresys.Open_eVision.Easy3D.E3DAxisSystem other
 )
```

Parameters

other

-

E3DAxisSystem.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAxisSystem operator=(
 Euresys.Open_eVision.Easy3D.E3DAxisSystem other
 )
```

Parameters

other

The source E3DAxisSystem.

E3DAxisSystem.operator==

operator comparison

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DAxisSystem other
 )
```

Parameters

other

-

E3DAxisSystem.Origin

Gets the origin.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint Origin
  { get; }
```

E3DAxisSystem.Save

Save the E3DAxisSystem configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

4.6. E3DBox Class

A 3D box, used as bounding volume for E3DObject class. A box is defined by a center, 3 axis and 3 extent for the 3 axis. A 3D point (x,y,z) is inside the E3DBox if ... By default a E3DBox is an axis aligned unit cube, centered on the origin.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Axes	3D orthonormal axis system of the box.
Center	3D box center.
XAxis	X axis of the box.
XSize	Size of the 3D box along its X axis .
XYQuadrangle	2D quadrangle of the E3DBox in the XY plane
YAxis	Y axis of the box.
YSize	Size of the 3D box along its Y axis.

ZAxis	Z axis of the box.
ZSize	Size of the 3D box along its Z axis.

Methods

E3DBox	Constructs an E3DBox. By default a E3DBox is an axis aligned unit cube, centered on the origin.
Load	Loads the E3DBox. The given ESerializer must have been created for reading.
operator!=	Checks if two E3DBox are different
operator=	Assignment operator for the E3DBox.
operator==	Checks if two E3DBox are strictly equal
Save	Saves the E3DBox. The given ESerializer must have been created for writing.
Transform	Transforms the 3D box with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only).

E3DBox.Axes

3D orthonormal axis system of the box.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DOrthonormalAxisSystem Axes
  { get; set; }
```

E3DBox.Center

3D box center.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint Center
  { get; }
```

E3DBox.E3DBox

Constructs an E3DBox. By default a E3DBox is an axis aligned unit cube, centered on the origin.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void E3DBox(
 )

void E3DBox(
 float xSize,
 float ySize,
 float zSize
 )

void E3DBox(
 Euresys.Open_eVision.Easy3D.E3DOrthonormalAxisSystem axes,
 float xSize,
 float ySize,
 float zSize
 )

void E3DBox(
 Euresys.Open_eVision.Easy3D.E3DBox other
 )

void E3DBox(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float xSize,
 float ySize,
 float zSize
 )

void E3DBox(
 Euresys.Open_eVision.EFloatRange xBounds,
 Euresys.Open_eVision.EFloatRange yBounds,
 Euresys.Open_eVision.EFloatRange zBounds
 )

void E3DBox(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float roll,
 float pitch,
 float yaw,
 float xSize,
 float ySize,
 float zSize
 )
```

Parameters

xSize
The full size of the box along the X axis.
ySize
The full size of the box along the Y axis.
zSize
The full size of the box along the Z axis.
axes
Axis system.
other
Reference to another E3DBox used for the initialization.
center
The 3D coordinate of the box center.
xBounds
The bounds of box along the X axis.
yBounds
The bounds of box along the Y axis.
zBounds
The bounds of box along the Z axis.
roll
Roll (rotation along the X axis) of the box.
pitch
Pitch (rotation along the Y axis) of the box.
yaw
Yaw (rotation along the Z axis) of the box.

Remarks

By convention, roll is applied first and yaw last.

E3DBox.Load

Loads the E3DBox. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

E3DBox.operator!=

Checks if two E3DBox are different

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator!=(
 Euresys.Open_eVision.Easy3D.E3DBox other
 )
```

Parameters

other
-

E3DBox.operator=

Assignment operator for the E3DBox.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DBox operator=(
 Euresys.Open_eVision.Easy3D.E3DBox other
 )
```

Parameters

other
-

E3DBox.operator==

Checks if two E3DBox are strictly equal

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DBox other
 )
```

Parameters

other

-

E3DBox.Save

Saves the E3DBox. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DBox.Transform

Transforms the 3D box with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DBox Transform(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

The 3D transformation matrix.

E3DBox.XAxis

X axis of the box.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint XAxis
  { get; }
```

E3DBox.XSize

Size of the 3D box along its X axis .

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float XSize
  { get; set; }
```

E3DBox.XYQuadrangle

2D quadrangle of the E3DBox in the XY plane

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EQuadrangle XYQuadrangle
  { get; }
```

E3DBox.YAxis

Y axis of the box.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint YAxis
  { get; }
```

E3DBox.YSize

Size of the 3D box along its Y axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float YSize
```

```
{ get; set; }
```

E3DBox.ZAxis

Z axis of the box.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint ZAxis
  { get; }
```

E3DBox.ZSize

Size of the 3D box along its Z axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float ZSize
  { get; set; }
```

4.7. E3DComparer Class

Represents a 3D comparison context.

Namespace: Euresys.Open_eVision.Easy3D

Properties

AutomaticCropFactor	Sets/Gets the automatic cropping factor. The factor multiplies the anomaly distance threshold (E3DComparer::SetAnomalyThresholds) to obtain the margin for the cropping. If the value is smaller than 0, then no crop is performed before computing the distance. Default: 1
ComparisonDistanceMode	Sets/Gets the distance mode for the 3D comparison. All values of the enum are not allowed for E3DComparer. Default: Euclidean.
DontCare	Sets/Gets a vector of E3DBox that defines the regions that should not be compared. By default, no point of the reference is ignored.
EnableAutomaticDecimation	If True, the given reference is automatically decimated with a resolution depending on the distance threshold to speed-up processing. If False, all the points of the given reference are used to compute the distance. Default: True

EnableAutomaticEdgeCropping	If True, edges in the reference will be cropped automatically. This is useful to avoid false positives that could occur near the edges of the object, in particular when using normals (see E3DComparer and EComparisonDistanceMode). To modify the parameters of the cropping, see E3DComparer::SetEdgeCroppingParameters. Default: False
MeshReference	Sets the 3D reference model. See also E3DComparer::PointCloudReference.
NoExtraMaterial	Sets/Gets a vector of E3DBox that defines the regions where there should not be points in the scan far from the reference. By default, the points far from the reference are not considered as anomalies (if there also are some other points closer to the reference).
PointCloudReference	Sets the 3D reference model. See also E3DComparer::MeshReference.
ROI	Sets/Gets a vector of E3DBox that defines the regions that should be compared. By default, the entire reference is considered.

Methods

Compare	Compares the reference patterns against a scan.
ComputesAnomalies	Computes the anomalies and returns them as a vector of E3DAnomaly.
E3DComparer	Constructs a 3D matching context.
GetAnomalyHysteresis	Gets the hysteresis related to the anomalies detection.
GetAnomalyThresholds	Gets the thresholds related to the anomalies detection.
GetComparisonPointCloud	Gets the EPointCloud that is used for the comparison.
GetEdgeCroppingParameters	Gets the parameters driving the edge cropping.
Load	Loads the E3DComparer. The given ESerializer must have been created for reading.
operator=	Assignment operator.
PrepareReference	Prepare the reference internal structures. By default, this is done on the first call to E3DComparer::Compare.
Save	Saves the E3DComparer. The given ESerializer must have been created for writing.
SetAnomalyHysteresis	Sets the hysteresis related to the anomalies detection.
SetAnomalyThresholds	Sets the thresholds related to the anomalies detection.
SetEdgeCroppingParameters	Sets the parameters driving the edge cropping.

E3DComparer.AutomaticCropFactor

Sets/Gets the automatic cropping factor. The factor multiplies the anomaly distance threshold (E3DComparer::SetAnomalyThresholds) to obtain the margin for the cropping. If the value is smaller than 0, then no crop is performed before computing the distance.
Default: 1

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float AutomaticCropFactor
  { get; set; }
```

Remarks

Note that if the cropping margin is too small, the E3DPoint of the anomalies will not be visible (with the function E3DComparer::GetComparisonPointCloud and the parameter pointFromReference = False). Moreover, if the E3DComparer is set to False, the anomalies will not be detected.

E3DComparer.Compare

Compares the reference patterns against a scan.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Compare(
 Euresys.Open_eVision.Easy3D.EPointCloud scan
 )
```

Parameters

scan

An EPointCloud that represents the scan to compare to the reference.

E3DComparer.ComparisonDistanceMode

Sets/Gets the distance mode for the 3D comparison. All values of the enum are not allowed for E3DComparer. Default: Euclidean.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EComparisonDistanceMode ComparisonDistanceMode
  { get; set; }
```

E3DComparer.ComputesAnomalies

Computes the anomalies and returns them as a vector of E3DAnomaly.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAnomaly[] ComputesAnomalies(
 )
```

E3DComparer.DontCare

Sets/Gets a vector of E3DBox that defines the regions that should not be compared. By default, no point of the reference is ignored.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DBox[] DontCare
  { get; set; }
```

E3DComparer.E3DComparer

Constructs a 3D matching context.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DComparer(
 )
void E3DComparer(
 Euresys.Open_eVision.Easy3D.E3DComparer other
 )
```

Parameters

other

Another E3DComparer object to be copied in the new E3DComparer object.

E3DComparer.EnableAutomaticDecimation

If True, the given reference is automatically decimated with a resolution depending on the distance threshold to speed-up processing. If False, all the points of the given reference are used to compute the distance.
Default: True

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableAutomaticDecimation
  { get; set; }
```

E3DComparer.EnableAutomaticEdgeCropping

If True, edges in the reference will be cropped automatically. This is useful to avoid false positives that could occur near the edges of the object, in particular when using normals (see E3DComparer and EComparisonDistanceMode). To modify the parameters of the cropping, see E3DComparer::SetEdgeCroppingParameters. Default: False

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableAutomaticEdgeCropping
  { get; set; }
```

E3DComparer.GetAnomalyHysteresis

Gets the hysteresis related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetAnomalyHysteresis(
 out float distanceHysteresisFactor,
 out float areaHysteresisFactor
 )
```

Parameters

distanceHysteresisFactor

The distance hysteresis factor. Must be greater than or equal to 1. Default: 1

areaHysteresisFactor

The area hysteresis factor. Must be smaller than or equal to 1. Default: 1.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See E3DComparer::SetAnomalyThresholds. In addition, an hysteresis can be specified, such that the cluster will also have to contain a subset of points whose distance is greater than distanceHysteresisFactor * distanceThreshold and area greater than areaHysteresisFactor * areaThreshold. See also E3DComparer::SetAnomalyThresholds.

E3DComparer.GetAnomalyThresholds

Gets the thresholds related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetAnomalyThresholds(
 out float distanceThreshold,
 out float areaThreshold
 )
```

Parameters

distanceThreshold

The distance threshold.

areaThreshold

The area threshold.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See also E3DComparer::SetAnomalyHysteresis to more advanced anomaly detection.

E3DComparer.GetComparisonPointCloud

Gets the EPointCloud that is used for the comparison.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetComparisonPointCloud(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut,
 bool storeDistances,
 bool storeColors,
 bool fullModel
 )
```

Parameters

cloudOut

Where to store the EPointCloud.

storeDistances

If set to True, the distances computed will be stored in the EPointCloud the functions EPointCloud::GetAttribute and EPointCloud::GetAttributeBuffer can be used with Distance to retrieve the distances.
Default: True

storeColors

If set to True, the colors related to the distances computed will be stored in the EPointCloud the functions EPointCloud::GetAttribute and EPointCloud::GetAttributeBuffer can be used with Color to retrieve the distances. The colors can also be used in the E3DViewer.
Default: True

fullModel

If set to True, the points that are not inside the ROI (see E3DComparer::ROI) will also be in the EPointCloud. Default: False

E3DComparer.GetEdgeCroppingParameters

Gets the parameters driving the edge cropping.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetEdgeCroppingParameters(
 out uint numberNeighbors,
 out float curvatureThreshold
 )
```

Parameters

numberNeighbors

The number of neighbors that we will use to compute the local curvature. The bigger this parameter, the thicker the cropping will be. This number must be bigger than 10. Default: 100

curvatureThreshold

The curvature value above which a point is cropped (must be between 0 and 1). Default: 0.15

Remarks

Edge cropping is disabled by default, enable it using E3DComparer::EnableAutomaticEdgeCropping.

E3DComparer.Load

Loads the E3DComparer. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DComparer.MeshReference

Sets the 3D reference model. See also E3DComparer::PointCloudReference.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EMesh MeshReference
  { get; set; }
```

E3DComparer.NoExtraMaterial

Sets/Gets a vector of E3DBox that defines the regions where there should not be points in the scan far from the reference. By default, the points far from the reference are not considered as anomalies (if there also are some other points closer to the reference).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DBox[] NoExtraMaterial
  { get; set; }
```

E3DComparer.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DComparer operator=(
 Euresys.Open_eVision.Easy3D.E3DComparer other
 )
```

Parameters

other

The E3DComparer object that should be copied.

E3DComparer.PointCloudReference

Sets the 3D reference model. See also E3DComparer::MeshReference.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloud PointCloudReference
  { get; set; }
```

E3DComparer.PrepareReference

Prepare the reference internal structures. By default, this is done on the first call to E3DComparer::Compare.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void PrepareReference(
 )
```

E3DComparer.ROI

Sets/Gets a vector of E3DBox that defines the regions that should be compared. By default, the entire reference is considered.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DBox[] ROI
  { get; set; }
```

E3DComparer.Save

Saves the E3DComparer. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DComparer.SetAnomalyHysteresis

Sets the hysteresis related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetAnomalyHysteresis(
 float distanceHysteresisFactor,
 float areaHysteresisFactor
 )
```

Parameters

distanceHysteresisFactor

The distance hysteresis factor. Must be greater than or equal to 1. Default: 1

areaHysteresisFactor

The area hysteresis factor. Must be smaller than or equal to 1. Default: 1.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See E3DComparer::SetAnomalyThresholds. In addition, an hysteresis can be specified, such that the cluster will also have to contain a subset of points whose distance is greater than distanceHysteresisFactor * distanceThreshold and area greater than areaHysteresisFactor * areaThreshold. See also E3DComparer::SetAnomalyThresholds.

E3DComparer.SetAnomalyThresholds

Sets the thresholds related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetAnomalyThresholds(
 float distanceThreshold,
 float areaThreshold
 )
```

Parameters

distanceThreshold

The distance threshold.

areaThreshold

The area threshold.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See also E3DComparer::SetAnomalyHysteresis to more advanced anomaly detection.

E3DComparer.SetEdgeCroppingParameters

Sets the parameters driving the edge cropping.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetEdgeCroppingParameters(
 uint numberNeighbors,
 float curvatureThreshold
 )
```

Parameters

numberNeighbors

The number of neighbors that we will use to compute the local curvature. The bigger this parameter, the thicker the cropping will be. This number must be bigger than 10. Default: 100

curvatureThreshold

The curvature value above which a point is cropped (must be between 0 and 1). Default: 0.15

Remarks

Edge cropping is disabled by default, enable it using E3DComparer::EnableAutomaticEdgeCropping.

4.8. E3DLine Class

Represents a 3D line.

Namespace: Euresys.Open_eVision.Easy3D

Properties

FirstPoint	Gets the first point of the line.
SecondPoint	Gets the second point of the line.

Methods

Define	(re)Defines the line parameters: It is possible to use the first and the second points of the line.
E3DLine	Creates an E3DLine object. It is possible to initialize it by specifying its two points.
Load	Loads a E3DLine. The given ESerializer must have been created for reading.
operator!=	Operator "!=": tests if two E3DLine objects are different.
operator=	Assignment operator
operator==	Operator "==": tests if two E3DLine objects are identical
Save	Saves a E3DLine. The given ESerializer must have been created for writing.

E3DLine.Define

(re)Defines the line parameters:
It is possible to use the first and the second points of the line.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Define(
 Euresys.Open_eVision.Easy3D.E3DPoint p1,
 Euresys.Open_eVision.Easy3D.E3DPoint p2
 )
```

Parameters

p1

-

p2

-

E3DLine.E3DLine

Creates an E3DLine object.
It is possible to initialize it by specifying its two points.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DLine(
 )
void E3DLine(
 Euresys.Open_eVision.Easy3D.E3DPoint p1,
 Euresys.Open_eVision.Easy3D.E3DPoint p2
 )
void E3DLine(
 Euresys.Open_eVision.Easy3D.E3DLine other
 )
```

Parameters

p1

The first point of the line.

p2

The second point of the line.

other

-

E3DLine.FirstPoint

Gets the first point of the line.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint FirstPoint
  { get; }
```

E3DLine.Load

Loads a E3DLine. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is read from.

E3DLine.operator!=

Operator "!=": tests if two E3DLine objects are different.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator!=(
 Euresys.Open_eVision.Easy3D.E3DLine other
 )
```

Parameters

other

-

E3DLine.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DLine operator=(
 Euresys.Open_eVision.Easy3D.E3DLine other
 )
```

Parameters

other

The E3DLine object that should be copied.

E3DLine.operator==

Operator "==": tests if two E3DLine objects are identical

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DLine other
 )
```

Parameters

other

-

E3DLine.Save

Saves a E3DLine. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

E3DLine.SecondPoint

Gets the second point of the line.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint SecondPoint
  { get; }
```

4.9. E3DMatch Class

Represents a 3D match returned by E3DMatcher.

Base Class:E3DAlignment

Namespace: Euresys.Open_eVision.Easy3D

Properties

Anomalies	Gets the list of E3DAnomaly of the E3DMatch. The anomalies represent zones where there are important discrepancies between the sample and the reference.

Methods

E3DMatch	Constructs an E3DMatch.
operator=	Assignment operator.

E3DMatch.Anomalies

Gets the list of E3DAnomaly of the E3DMatch. The anomalies represent zones where there are important discrepancies between the sample and the reference.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DAnomaly[] Anomalies
  { get; }
```

E3DMatch.E3DMatch

Constructs an E3DMatch.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void E3DMatch(
 )
void E3DMatch(
 Euresys.Open_eVision.Easy3D.E3DMatch other
 )
void E3DMatch(
 Euresys.Open_eVision.Easy3D.E3DAlignment other
 )
```

Parameters

other

Another E3DMatch object to be copied in the new E3DMatch object.

E3DMatch.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DMatch operator=(
 Euresys.Open_eVision.Easy3D.E3DMatch other
 )
```

Parameters

other

The E3DMatch object that should be copied.

4.10. E3DMatcher Class

Aligns an EPointCloud or EZMap on and compares it with a reference EMesh, EPointCloud or EZMap.

Base Class:E3DAligner

Namespace: Euresys.Open_eVision.Easy3D

Properties

AllComparisonNoExtraMaterial	Sets/Gets the ERegion that should not have extra material in the scan. A pointer to ERegion per reference pose is needed and they should be given in the corresponding order and should be of the same size than their corresponding reference poses projection. See E3DAligner::RetrieveReferencePosesProjections. By default, the points in the scan far from the reference are not considered as anomalies (except if there are missing points in the scan nearby).
AllComparisonROI	Sets/Gets the ERegion that should be compared for all of the references. A pointer to ERegion per reference pose is needed and they should be given in the corresponding order and should be of the same size than their corresponding reference poses projections. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.
AutomaticCropFactor	Sets/Gets the automatic cropping factor. The factor multiplies the anomaly distance threshold (E3DMatcher::SetAnomalyThresholds) to obtain the margin for the cropping. If the value is smaller than 0, then no crop is performed before computing the distance. Default: 1

ComparisonDistanceMode	Sets/Gets the distance mode for the 3D comparison. Default: Euclidean.
EnableAutomaticDecimation	If True, the given cloud or ZMap is automatically decimated with a resolution depending on the distance threshold to speed-up processing. If False, all the points of the given cloud or ZMap are used to compute the distance. Default: True
EnableAutomaticEdgeCropping	If True, edges in the reference will be cropped automatically. This is useful to avoid false positives that could occur near the edges of the object, in particular when using normals (see E3DMatcher::ComparisonDistanceMode and EComparisonDistanceMode). To modify the parameters of the cropping, see E3DMatcher::SetEdgeCroppingParameters. Default: False
EnableMissingPointAsAnomaly	If True, the points that are not present in the scan (but are present in the reference), are considered as anomalies. If False, only points that are present in the scan can be considered as anomalies. Default: True

Methods

ClearComparisonNoExtraMaterial	Clears the ERegion that should not have extra material in the scan. See also E3DMatcher::AllComparisonNoExtraMaterial and E3DMatcher::SetComparisonNoExtraMaterial.
ClearComparisonROI	Clears the ERegion that should be compared for all of the references. See also E3DMatcher::AllComparisonROI and E3DMatcher::SetComparisonROI.
E3DMatcher	Constructs a 3D matching context.
GetAnomalyHysteresis	Gets the hysteresis related to the anomalies detection.
GetAnomalyThresholds	Gets the thresholds related to the anomalies detection.
GetComparisonNoExtraMaterial	Sets/Gets the ERegion that should not have extra material in the scan. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.
GetComparisonPointCloud	Gets the EPointCloud on which anomalies are detected.
GetComparisonROI	Sets/Gets the ERegion of the reference that should be compared. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.
GetEdgeCroppingParameters	Gets the parameters driving the edge cropping.
Load	Loads the E3DMatcher. The given ESerializer must have been created for reading.
Match	Matches the reference patterns against an EZMap or an EPointCloud.
operator=	Assignment operator.

PrepareReference	Prepare the reference internal structures. By default, this is done on the first call to E3DMatcher::Match.
Save	Saves the E3DMatcher. The given ESerializer must have been created for writing.
SetAnomalyHysteresis	Sets the hysteresis related to the anomalies detection.
SetAnomalyThresholds	Sets the thresholds related to the anomalies detection.
SetComparisonNoExtraMaterial	Sets/Gets the ERegion that should not have extra material in the scan. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.
SetComparisonROI	Sets/Gets the ERegion of the reference that should be compared. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.
SetEdgeCroppingParameters	Sets the parameters driving the edge cropping.

E3DMatcher.AllComparisonNoExtraMaterial

Sets/Gets the ERegion that should not have extra material in the scan. A pointer to ERegion per reference pose is needed and they should be given in the corresponding order and should be of the same size than their corresponding reference poses projection. See E3DAligner::RetrieveReferencePosesProjections. By default, the points in the scan far from the reference are not considered as anomalies (except if there are missing points in the scan nearby).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.ERegion[] AllComparisonNoExtraMaterial
  { get; set; }
```

E3DMatcher.AllComparisonROI

Sets/Gets the ERegion that should be compared for all of the references. A pointer to ERegion per reference pose is needed and they should be given in the corresponding order and should be of the same size than their corresponding reference poses projections. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.ERegion[] AllComparisonROI
  { get; set; }
```

E3DMatcher.AutomaticCropFactor

Sets/Gets the automatic cropping factor. The factor multiplies the anomaly distance threshold (E3DMatcher::SetAnomalyThresholds) to obtain the margin for the cropping. If the value is smaller than 0, then no crop is performed before computing the distance.
Default: 1

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float AutomaticCropFactor
  { get; set; }
```

Remarks

Note that if the cropping margin is too small, the E3DPoint of the anomalies will not be visible (with the function E3DMatcher::GetComparisonPointCloud and the parameter pointFromReference = False). Moreover, if the E3DMatcher::EnableMissingPointAsAnomaly is set to False, the anomalies will not be detected.

E3DMatcher.ClearComparisonNoExtraMaterial

Clears the ERegion that should not have extra material in the scan. See also E3DMatcher::AllComparisonNoExtraMaterial and E3DMatcher::SetComparisonNoExtraMaterial.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearComparisonNoExtraMaterial(
 )
```

E3DMatcher.ClearComparisonROI

Clears the ERegion that should be compared for all of the references. See also E3DMatcher::AllComparisonROI and E3DMatcher::SetComparisonROI.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearComparisonROI(
 )
```

E3DMatcher.ComparisonDistanceMode

Sets/Gets the distance mode for the 3D comparison. Default: Euclidean.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EComparisonDistanceMode ComparisonDistanceMode
  { get; set; }
```

E3DMatcher.E3DMatcher

Constructs a 3D matching context.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void E3DMatcher(
 )
void E3DMatcher(
 Euresys.Open_eVision.Easy3D.E3DMatcher other
 )
```

Parameters

other

Another E3DMatcher object to be copied in the new E3DMatcher object.

E3DMatcher.EnableAutomaticDecimation

If True, the given cloud or ZMap is automatically decimated with a resolution depending on the distance threshold to speed-up processing. If False, all the points of the given cloud or ZMap are used to compute the distance.
Default: True

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableAutomaticDecimation
  { get; set; }
```

E3DMatcher.EnableAutomaticEdgeCropping

If True, edges in the reference will be cropped automatically. This is useful to avoid false positives that could occur near the edges of the object, in particular when using normals (see E3DMatcher::ComparisonDistanceMode and EComparisonDistanceMode).
To modify the parameters of the cropping, see E3DMatcher::SetEdgeCroppingParameters.
Default: False

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableAutomaticEdgeCropping
  { get; set; }
```

E3DMatcher.EnableMissingPointAsAnomaly

If True, the points that are not present in the scan (but are present in the reference), are considered as anomalies. If False, only points that are present in the scan can be considered as anomalies.
Default: True

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableMissingPointAsAnomaly
  { get; set; }
```

Remarks

Setting the value to False can be interesting when for example there are different shadow effects on the reference and on the scan or if there are illumination issues in the scan.

E3DMatcher.GetAnomalyHysteresis

Gets the hysteresis related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetAnomalyHysteresis(
 out float distanceHysteresisFactor,
 out float areaHysteresisFactor
 )
```

Parameters

distanceHysteresisFactor

The distance hysteresis factor. Must be greater than or equal to 1. Default: 1

areaHysteresisFactor

The area hysteresis factor. Must be smaller than or equal to 1. Default: 1.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See E3DMatcher::SetAnomalyThresholds. In addition, an hysteresis can be specified, such that the cluster will also have to contain a subset of points whose distance is greater than distanceHysteresisFactor * distanceThreshold and area greater than areaHysteresisFactor * areaThreshold. See also E3DMatcher::SetAnomalyThresholds.

E3DMatcher.GetAnomalyThresholds

Gets the thresholds related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetAnomalyThresholds(
 out float distanceThreshold,
 out float areaThreshold
 )
```

Parameters

distanceThreshold

The distance threshold.

areaThreshold

The area threshold.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See also E3DMatcher::SetAnomalyHysteresis to more advanced anomaly detection.

E3DMatcher.GetComparisonNoExtraMaterial

Sets/Gets the ERegion that should not have extra material in the scan. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERegion GetComparisonNoExtraMaterial(
 int offset
 )
```

Parameters

offset

offset of the ERegion to get back.

Remarks

This method is a shortcut of E3DMatcher when you only want to set/get one reference pose.

E3DMatcher.GetComparisonPointCloud

Gets the EPointCloud on which anomalies are detected.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetComparisonPointCloud(
 Euresys.Open_eVision.Easy3D.EPointCloud comparisonCloud,
 bool storeDistances,
 bool storeColors,
 bool pointFromReference,
 bool fullModel
 )
```

Parameters

comparisonCloud

The EPointCloud in which to copy the data.

storeDistances

If set to True, the distances computed will be stored in the EPointCloud.
Default: True

storeColors

If set to True, the colors related to the distances computed will be stored in the EPointCloud.
Default: True

pointFromReference

If set to True, the points from the reference will be stored in comparisonCloud. Otherwise, it will be the points from the scan.
If E3DMatcher::ComparisonDistanceMode is set to Normals_Advanced, result always contains points from the scan.
Default: False

fullModel

If set to True, the points that are not inside the ROI (see E3DMatcher) will also be in the EPointCloud.
Default: False

E3DMatcher.GetComparisonROI

Sets/Gets the ERegion of the reference that should be compared. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.ERegion GetComparisonROI(
 int offset
 )
```

Parameters

offset

offset of the ERegion to get back.

Remarks

This method is a shortcut of E3DMatcher when you only want to set/get one reference pose.

E3DMatcher.GetEdgeCroppingParameters

Gets the parameters driving the edge cropping.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetEdgeCroppingParameters(
 out uint numberNeighbors,
 out float curvatureThreshold
 )
```

Parameters

numberNeighbors

The number of neighbors that we will use to compute the local curvature. The bigger this parameter, the thicker the cropping will be. This number must be bigger than 10. Default: 100

curvatureThreshold

The curvature value above which a point is cropped (must be between 0 and 1). Default: 0.15

Remarks

Edge cropping is disabled by default, enable it using E3DMatcher::EnableAutomaticEdgeCropping.

E3DMatcher.Load

Loads the E3DMatcher. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DMatcher.Match

Matches the reference patterns against an EZMap or an EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DMatch Match(
 Euresys.Open_eVision.Easy3D.EZMap zmap
 )
Euresys.Open_eVision.Easy3D.E3DMatch Match(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.E3DPlane projectionPlane
 )
Euresys.Open_eVision.Easy3D.E3DMatch Match(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 float azimuth,
 float elevation
 )
```

Parameters

zmap

The EZMap that will be aligned and compared with the reference.

cloud

The EPointCloud that will be aligned and compared with the reference.

projectionPlane

The plane on which the cloud is orthographically projected for alignment.

azimuth

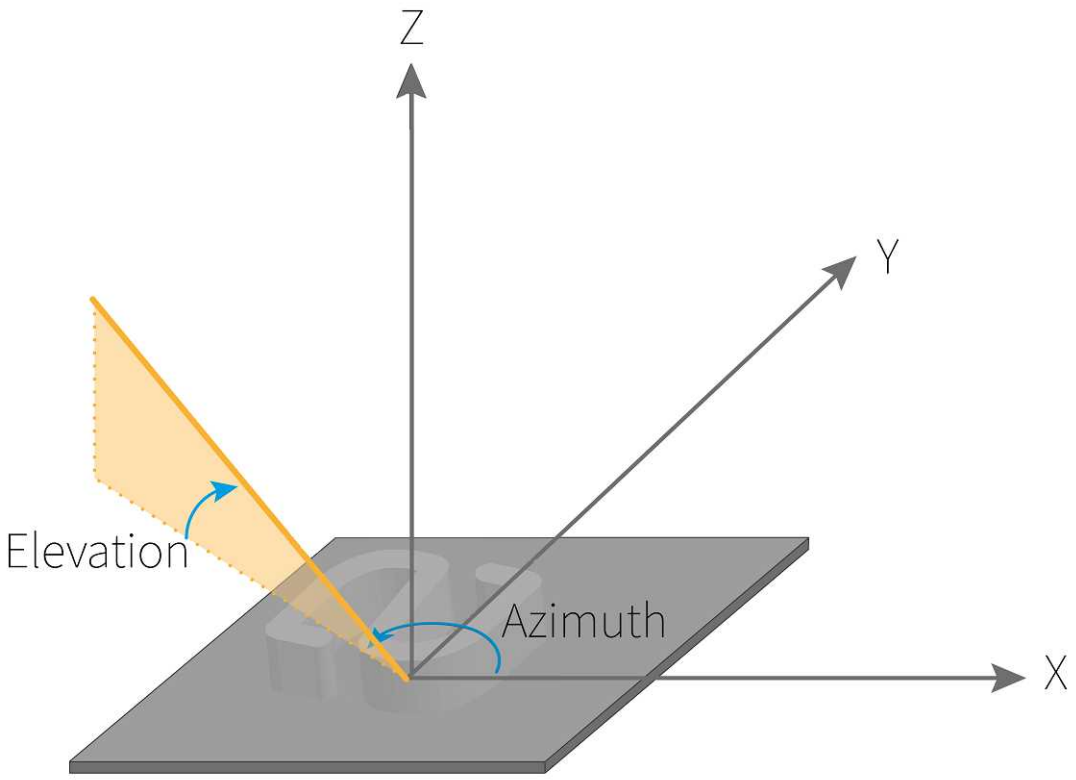
The azimuth angle of the normal of the projection plane in Easy::AngleUnit. Azimuth angles are oriented trigonometrically around the z axis. The x axis corresponds to an azimuth of 0 degrees.

elevation

The elevation angle of the normal of the projection plane in Easy::AngleUnit. Elevation angles represent how close the normal is to the z = 0 plane.

Remarks

When specifying azimuth and elevation, only the normal of the projection plane is specified. The distance from origin of the E3DPlane will be computed from the points cloud, so that all points of the cloud are visible. This might not be wanted if there are points in the cloud that are useless for the process (e.g. if we see other objects far below the model). This is also a bit slower as the plane's distance is recomputed on each scan.



E3DMatcher.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DMatcher operator=(
 Euresys.Open_eVision.Easy3D.E3DMatcher other
 )
```

Parameters

other

The E3DMatcher object that should be copied.

E3DMatcher.PrepareReference

Prepare the reference internal structures. By default, this is done on the first call to E3DMatcher::Match.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void PrepareReference(
 )
```

E3DMatcher.Save

Saves the E3DMatcher. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

E3DMatcher.SetAnomalyHysteresis

Sets the hysteresis related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetAnomalyHysteresis(
 float distanceHysteresisFactor,
 float areaHysteresisFactor
 )
```

Parameters

distanceHysteresisFactor

The distance hysteresis factor. Must be greater than or equal to 1. Default: 1

areaHysteresisFactor

The area hysteresis factor. Must be smaller than or equal to 1. Default: 1.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See E3DMatcher::SetAnomalyThresholds. In addition, an hysteresis can be specified, such that the cluster will also have to contain a subset of points whose distance is greater than distanceHysteresisFactor * distanceThreshold and area greater than areaHysteresisFactor * areaThreshold. See also E3DMatcher::SetAnomalyThresholds.

E3DMatcher.SetAnomalyThresholds

Sets the thresholds related to the anomalies detection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetAnomalyThresholds(
 float distanceThreshold,
 float areaThreshold
 )
```

Parameters

distanceThreshold

The distance threshold.

areaThreshold

The area threshold.

Remarks

To be considered as an anomaly, a cluster of points with a distance greater than distanceThreshold must have an area greater than areaThreshold. See also E3DMatcher::SetAnomalyHysteresis to more advanced anomaly detection.

E3DMatcher.SetComparisonNoExtraMaterial

Sets/Gets the ERegion that should not have extra material in the scan. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetComparisonNoExtraMaterial(
 Euresys.Open_eVision.ERegion noExtraMaterial
 )
```

Parameters

noExtraMaterial

A pointer to ERegion defining the area on which we will check no data is missing in the scan. This param is a shortcut to avoid building a vector of size 1.

Remarks

This method is a shortcut of E3DMatcher when you only want to set/get one reference pose.

E3DMatcher.SetComparisonROI

Sets/Gets the ERegion of the reference that should be compared. See E3DAligner::RetrieveReferencePosesProjections. By default, all the points of the reference are used for the comparison.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetComparisonROI(
 Euresys.Open_eVision.ERegion regionOfInterest
 )
```

Parameters

regionOfInterest

A pointer to ERegion defining the area that will be used for comparison with the reference pose. This param is a shortcut to avoid building a vector of size 1.

Remarks

This method is a shortcut of E3DMatcher when you only want to set/get one reference pose.

E3DMatcher.SetEdgeCroppingParameters

Sets the parameters driving the edge cropping.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetEdgeCroppingParameters(
 uint numberNeighbors,
 float curvatureThreshold
 )
```

Parameters

numberNeighbors

The number of neighbors that we will use to compute the local curvature. The bigger this parameter, the thicker the cropping will be. This number must be bigger than 10. Default: 100

curvatureThreshold

The curvature value above which a point is cropped (must be between 0 and 1). Default: 0.15

Remarks

Edge cropping is disabled by default, enable it using E3DMatcher::EnableAutomaticEdgeCropping.

4.11. E3DObject Class

A E3DObject is a geometric description of a set of 3D points, produced by E3DObjectExtractor. Several 3D features are available. All 3D features are expressed in the ZMap metric coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Area	Object area in metric units.
AspectRatio	Aspect ratio of the object. The aspect ratio is the smallest dimension divided by the largest dimension, its value is always between 0 and 1. The smaller the ratio, the more elongated the object is. A value of 1 means a perfectly square object (length=width).
AveragePosition	3D average position of the object.
BasePlane	Base plane. The base plane is calculated using points surrounding the object.
BaseTilt	Angle between the base plane and the vertical (Z) axis.
BoundingBox	The E3DBox (3D oriented bounding box) of the object. The bounding box is oriented in the XY plane of the ZMap space (rotation over the ZMap Z axis). The bounding box X and Y sizes are the object length and width (see E3DObject and E3DObject). The bounding box Z size is always in the ZMap Z axis direction.
Length	Length of the object in metric units. The length is the largest dimension of the object on the XY plane of the ZMap space.
LocalHeight	Local height of the object in metric units. The local height of the object is relative to the surroundings. The base plane is used as the reference for the calculation of the local height. If it is not possible to evaluate a base plane, the local height has the same value as the reference height (E3DObject)
LocalTilt	Angle between the object plane and the base plane.

LocalTopPosition	3D highest position of the object relatively to the object base plane. If it is not possible to evaluate a base plane, the local top position is the reference top position (E3DObject)
NumPixels	Number of ZMap pixels composing the object.
Orientation	Orientation of the object. The orientation is the angle between the object major (longest) axis and the ZMap X axis.
Plane	Plane fitted to the object 3D positions.
RectangleRegion	ERectangleRegion enclosing the object ZMap pixels.
ReferenceHeight	Reference height of the object in metric units. The reference height of the object is relative to the ZMap origin (also known as the reference plane).
ReferenceTilt	Angle between the object plane and the vertical (Z) axis.
ReferenceTopPosition	3D top position relative to the ZMap origin (this is the position with the highest Z coordinate)
Region	ERegion composed of the object ZMap pixels.
Sphere	Sphere fitted to the object
Volume	Object volume in metric units.
Width	Width of the object in metric units. The width is the smallest dimension of the object on the XY plane of the ZMap space.

Methods

Draw	Draws the specified feature of the object in the given graphic context
E3DObject	Constructs an E3DObject with default (invalid) values
GetIsFeatureComputed	returns true or false depending if the feature was computed for this object
Load	Loads the E3DObject. The given ESerializer must have been created for reading.
operator=	Assignment operator
operator==	Comparison operator
Save	Saves the E3DObject. The given ESerializer must have been created for writing.
Transform	Transforms the 3D object with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only). Image based attributes of the 3D object are unchanged.

E3DObject.Area

Object area in metric units.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Area
  { get; }
```

E3DObject.AspectRatio

Aspect ratio of the object. The aspect ratio is the smallest dimension divided by the largest dimension, its value is always between 0 and 1. The smaller the ratio, the more elongated the object is. A value of 1 means a perfectly square object (length=width).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float AspectRatio
  { get; }
```

E3DObject.AveragePosition

3D average position of the object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint AveragePosition
  { get; }
```

E3DObject.BasePlane

Base plane. The base plane is calculated using points surrounding the object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane BasePlane
  { get; }
```

E3DObject.BaseTilt

Angle between the base plane and the vertical (Z) axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float BaseTilt
  { get; }
```

E3DObject.BoundingBox

The E3DBox (3D oriented bounding box) of the object. The bounding box is oriented in the XY plane of the ZMap space (rotation over the ZMap Z axis). The bounding box X and Y sizes are the object length and width (see E3DObject and E3DObject). The bounding box Z size is always in the ZMap Z axis direction.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DBox BoundingBox
  { get; }
```

E3DObject.Draw

Draws the specified feature of the object in the given graphic context

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

feature

The feature to draw.

color

The color in which to draw the feature (optional).

zoomX

-

zoomY

-

panX

-

panY

-

graphicContext

Graphic context on which to draw.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

E3DObject.E3DObject

Constructs an E3DObject with default (invalid) values

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DObject(
 )
void E3DObject(
 Euresys.Open_eVision.Easy3D.E3DObject other
 )
```

Parameters

other

-

E3DObject.GetIsFeatureComputed

returns true or false depending if the feature was computed for this object

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool GetIsFeatureComputed(
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

feature

-

E3DObject.Length

Length of the object in metric units. The length is the largest dimension of the object on the XY plane of the ZMap space.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Length
  { get; }
```

E3DObject.Load

Loads the E3DObject. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DObject.LocalHeight

Local height of the object in metric units. The local height of the object is relative to the surroundings. The base plane is used as the reference for the calculation of the local height. If it is not possible to evaluate a base plane, the local height has the same value as the reference height (E3DObject)

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float LocalHeight
  { get; }
```

E3DObject.LocalTilt

Angle between the object plane and the base plane.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float LocalTilt
  { get; }
```

E3DObject.LocalTopPosition

3D highest position of the object relatively to the object base plane. If it is not possible to evaluate a base plane, the local top position is the reference top position (E3DObject)

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint LocalTopPosition
  { get; }
```

E3DObject.NumPixels

Number of ZMap pixels composing the object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumPixels
  { get; }
```

E3DObject.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DObject operator=(
 Euresys.Open_eVision.Easy3D.E3DObject other
 )
```

Parameters

other

-

E3DObject.operator==

Comparison operator

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DObject other
 )
```

Parameters

other

The other E3DObject.

E3DObject.Orientation

Orientation of the object. The orientation is the angle between the object major (longest) axis and the ZMap X axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Orientation
  { get; }
```

E3DObject.Plane

Plane fitted to the object 3D positions.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane Plane
  { get; }
```

E3DObject.RectangleRegion

ERectangleRegion enclosing the object ZMap pixels.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERectangleRegion RectangleRegion
  { get; }
```

E3DObject.ReferenceHeight

Reference height of the object in metric units. The reference height of the object is relative to the ZMap origin (also known as the reference plane).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float ReferenceHeight
  { get; }
```

E3DObject.ReferenceTilt

Angle between the object plane and the vertical (Z) axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float ReferenceTilt
  { get; }
```

E3DObject.ReferenceTopPosition

3D top position relative to the ZMap origin (this is the position with the highest Z coordinate)

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint ReferenceTopPosition
  { get; }
```

E3DObject.Region

ERegion composed of the object ZMap pixels.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.ERegion Region
  { get; }
```

E3DObject.Save

Saves the E3DObject. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

E3DObject.Sphere

Sphere fitted to the object

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DSphere Sphere
  { get; }
```

E3DObject.Transform

Transforms the 3D object with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only). Image based attributes of the 3D object are unchanged.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DObject Transform(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

The 3D transformation matrix.

E3DObject.Volume

Object volume in metric units.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Volume
  { get; }
```

E3DObject.Width

Width of the object in metric units. The width is the smallest dimension of the object on the XY plane of the ZMap space.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Width
  { get; }
```

4.12. E3DObjectExtractor Class

E3DObjectExtractor is used to extract 3D objects from a ZMap.

Namespace: Euresys.Open_eVision.Easy3D

Properties

AreaRange	The allowed area range for the objects. Area is expressed in the metric coordinate system. E.g, if the ZMap space is in mm, the area is in mm2.
AspectRatioRange	The extraction 2D aspect ratio range. The aspect ratio is the smallest dimension divided by the largest dimension, its value is always between 0 and 1. The smaller the ratio, the more elongated the object is. A value of 1 means a perfectly square object (length=width).
BackgroundMask	Gets the ERegion composed of background ZMap pixels (where there is not object).
ContourReinforce	When contour reinforcement is enable, a filter is applied to the input image to detect and enhance the frontiers between objects. That option is interesting when objects to extract are in contact. The default state is false (OFF).
ExtractionSensitivity	Set or Get the extraction sensitivity. The sensitivity ranges from 0 (minimum sensitivity) to 1 (maximum sensitivity). With high sensitivity, the library tries to extract object that are mixed with their surrounding. Low sensitivity values tend to ignore faint objects. The default sensitivity value is 0.6.
LengthRange	The extraction object length range in metric units. Length is the largest dimension of the object, expressed the ZMap coordinate system.
LocalHeightRange	The extraction object local height range in metric units. Local height is the dimension of the object along the normal of the base plane. For a height based on the ZMap origin, use E3DObjectExtractor.
LocalTiltRange	The allowed angle range of the object local tilt. This is the angle between the base plane and the object plane. A value of 0 means that the object top surface is parallel to its base. Valid values are between 0 and +90 degrees (or 0 and Pi if angle unit is radians).
Objects	Returns the list of extracted objects. The objects are sorted from smallest area to largest area.
ObjectsMask	Gets the ERegion composed of all the objects ZMap pixels.
OrientationRange	The allowed angle range of the oriented 2D rectangle region. This is the angle of the longest axis (the length of the object), in counter clockwise direction, from the horizontal axis. Valid values are between -90 and +90 degrees (or -Pi/2 and Pi/2 if angle unit is radians).
OverlappedAreaRatio	Set or Get the object area ratio applicable when the overlapped mode is enabled. The area ratio defines the minimum area difference between 2 extracted objects that overlap. E.g with a value of 4, the top object must have an area at least 4 times smaller than the bottom object (or the bottom object must have an area at least 4 times bigger than the top object).
OverlappedHeightDifference	Set or Get the object height difference applicable when the overlapped mode is enabled. That value defines the minimum height difference between 2 overlapped objects.
OverlappedObject	Enable or disable the extraction of overlapped objects.

ReferenceHeightRange	The extraction object reference height range in metric units. Reference height is the dimension of the object along the ZMap Z axis from ZMap origin. For a height based on the object base plane, use E3DObjectExtractor.
ReferenceTiltRange	The allowed angle range of the object reference tilt. This is the angle between the object plane and the ZMap Z Axis. A value of 0 means that the object top surface is parallel to the ZMap XY plane. Valid values are between 0 and +90 degrees (or 0 and Pi if angle unit is radians).
VolumeRange	The allowed volume range for the objects. Volume is expressed in the metric coordinate system. E.g, if the ZMap space is in mm, the volume is in mm3.
WidthRange	The extraction object width range in metric units. Width is the smallest dimension of the object, expressed the ZMap coordinate system.

Methods

AddToMesh	For all extracted objects, adds a 3D representation (in the form of a list of triangles) of the given feature to the given mesh. If the feature is not defined for the E3DObject, this method has no effect.
Draw	Draws the specified feature of all extracted objects in the given graphic context. If the feature is not defined for the E3DObject, this method has no effect.
E3DObjectExtractor	Constructs an E3DObjectExtractor with default (invalid) values
Extract	Processes the ZMap and extracts a list of 3D objects matching the criteria. Returns the number of extracted objects.
GetComputeFeature	Returns true or false depending if the feature should be computed by the extractor.
Load	Load the E3DObjectExtractor. The given ESerializer must have been created for reading.
operator=	Assignment operator
operator==	Comparison operator
Save	Save the E3DObjectExtractor. The given ESerializer must have been created for writing.
SetAllComputeFeatures	Enables all features to be computed by the extractor.
SetComputeFeature	Sets true if the feature should computed by the extractor, false otherwise.
UnsetAllComputeFeatures	Disables all features to be computed by the extractor.

E3DObjectExtractor.AddToMesh

For all extracted objects, adds a 3D representation (in the form of a list of triangles) of the given feature to the given mesh. If the feature is not defined for the E3DObject, this method has no effect.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddToMesh(
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature,
 Euresys.Open_eVision.Easy3D.EMesh mesh
 )
```

Parameters

feature

The feature to draw, only 3D features are supported.

mesh

The mesh to add the graphics for.

E3DObjectExtractor.AreaRange

The allowed area range for the objects. Area is expressed in the metric coordinate system. E.g, if the ZMap space is in mm, the area is in mm2.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EFloatRange AreaRange
  { get; set; }
```

E3DObjectExtractor.AspectRatioRange

The extraction 2D aspect ratio range. The aspect ratio is the smallest dimension divided by the largest dimension, its value is always between 0 and 1. The smaller the ratio, the more elongated the object is. A value of 1 means a perfectly square object (length=width).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EFloatRange AspectRatioRange
  { get; set; }
```

E3DObjectExtractor.BackgroundMask

Gets the ERegion composed of background ZMap pixels (where there is not object).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERegion BackgroundMask
```

```
    { get; }
```

E3DObjectExtractor.ContourReinforce

When contour reinforcement is enable, a filter is applied to the input image to detect and enhance the frontiers between objects. That option is interesting when objects to extract are in contact. The default state is false (OFF).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ContourReinforce
    { get; set; }
```

E3DObjectExtractor.Draw

Draws the specified feature of all extracted objects in the given graphic context. If the feature is not defined for the E3DObject, this method has no effect.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext
Graphic context on which to draw.

feature
The feature to draw.

color
The color in which to draw the feature (optional).

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY
Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

E3DObjectExtractor.E3DObjectExtractor

Constructs an E3DObjectExtractor with default (invalid) values

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void E3DObjectExtractor(
 )
void E3DObjectExtractor(
 Euresys.Open_eVision.Easy3D.E3DObjectExtractor other
 )
```

Parameters

other
-

E3DObjectExtractor.Extract

Processes the ZMap and extracts a list of 3D objects matching the criteria. Returns the number of extracted objects.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap8 zMap
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap8 zMap,
 Euresys.Open_eVision.ERegion region
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap16 zMap
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap16 zMap,
 Euresys.Open_eVision.ERegion region
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap32f zMap
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap32f zMap,
 Euresys.Open_eVision.ERegion region
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap zMap
 )
int Extract(
 Euresys.Open_eVision.Easy3D.EZMap zMap,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

zMap

The source ZMap.

region

The region of interest, only pixels inside the given region are considered for object extraction.

E3DObjectExtractor.ExtractionSensitivity

Set or Get the extraction sensitivity. The sensitivity ranges from 0 (minimum sensitivity) to 1 (maximum sensitivity). With high sensitivity, the library tries to extract object that are mixed with their surrounding. Low sensitivity values tend to ignore faint objects. The default sensitivity value is 0.6.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float ExtractionSensitivity
  { get; set; }
```

E3DObjectExtractor.GetComputeFeature

Returns true or false depending if the feature should be computed by the extractor.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool GetComputeFeature(
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

feature

-

E3DObjectExtractor.LengthRange

The extraction object length range in metric units. Length is the largest dimension of the object, expressed the ZMap coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange LengthRange
  { get; set; }
```

E3DObjectExtractor.Load

Load the E3DObjectExtractor. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

E3DObjectExtractor.LocalHeightRange

The extraction object local height range in metric units. Local height is the dimension of the object along the normal of the base plane. For a height based on the ZMap origin, use E3DObjectExtractor.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange LocalHeightRange
  { get; set; }
```

E3DObjectExtractor.LocalTiltRange

The allowed angle range of the object local tilt. This is the angle between the base plane and the object plane. A value of 0 means that the object top surface is parallel to its base. Valid values are between 0 and +90 degrees (or 0 and Pi if angle unit is radians).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange LocalTiltRange
  { get; set; }
```

E3DObjectExtractor.Objects

Returns the list of extracted objects. The objects are sorted from smallest area to largest area.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DObject[] Objects
  { get; }
```

E3DObjectExtractor.ObjectsMask

Gets the ERegion composed of all the objects ZMap pixels.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.ERegion ObjectsMask
  { get; }
```

E3DObjectExtractor.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DObjectExtractor operator=(
 Euresys.Open_eVision.Easy3D.E3DObjectExtractor other
 )
```

Parameters

other

-

E3DObjectExtractor.operator==

Comparison operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DObjectExtractor other
 )
```

Parameters

other

The other object.

E3DObjectExtractor.OrientationRange

The allowed angle range of the oriented 2D rectangle region. This is the angle of the longest axis (the length of the object), in counter clockwise direction, from the horizontal axis. Valid values are between -90 and +90 degrees (or -Pi/2 and Pi/2 if angle unit is radians).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange OrientationRange
```

```
{ get; set; }
```

E3DObjectExtractor.OverlappedAreaRatio

Set or Get the object area ratio applicable when the overlapped mode is enabled. The area ratio defines the minimum area difference between 2 extracted objects that overlap. E.g with a value of 4, the top object must have an area at least 4 times smaller than the bottom object (or the bottom object must have an area at least 4 times bigger than the top object).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float OverlappedAreaRatio
  { get; set; }
```

Remarks

See E3DObjectExtractor::OverlappedObject

E3DObjectExtractor.OverlappedHeightDifference

Set or Get the object height difference applicable when the overlapped mode is enabled. That value defines the minimum height difference between 2 overlapped objects.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float OverlappedHeightDifference
  { get; set; }
```

Remarks

See E3DObjectExtractor::OverlappedObject

E3DObjectExtractor.OverlappedObject

Enable or disable the extraction of overlapped objects.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool OverlappedObject
  { get; set; }
```

Remarks

See E3DObjectExtractor::OverlappedAreaRatio and E3DObjectExtractor::OverlappedHeightDifference

E3DObjectExtractor.ReferenceHeightRange

The extraction object reference height range in metric units. Reference height is the dimension of the object along the ZMap Z axis from ZMap origin. For a height based on the object base plane, use E3DObjectExtractor.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange ReferenceHeightRange
  { get; set; }
```

E3DObjectExtractor.ReferenceTiltRange

The allowed angle range of the object reference tilt. This is the angle between the object plane and the ZMap Z Axis. A value of 0 means that the object top surface is parallel to the ZMap XY plane. Valid values are between 0 and +90 degrees (or 0 and Pi if angle unit is radians).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange ReferenceTiltRange
  { get; set; }
```

E3DObjectExtractor.Save

Save the E3DObjectExtractor. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

E3DObjectExtractor.SetAllComputeFeatures

Enables all features to be computed by the extractor.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetAllComputeFeatures(
 )
```

E3DObjectExtractor.SetComputeFeature

Sets true if the feature should computed by the extractor, false otherwise.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetComputeFeature(
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature,
 bool enable
 )
```

Parameters

feature

A feature from E3DObjectFeature.

enable

A bool to choose whether to enable or disable a feature.

E3DObjectExtractor.UnsetAllComputeFeatures

Disables all features to be computed by the extractor.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetAllComputeFeatures(
 )
```

E3DObjectExtractor.VolumeRange

The allowed volume range for the objects. Volume is expressed in the metric coordinate system. E.g, if the ZMap space is in mm, the volume is in mm3.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange VolumeRange
  { get; set; }
```

E3DObjectExtractor.WidthRange

The extraction object width range in metric units. Width is the smallest dimension of the object, expressed the ZMap coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange WidthRange
  { get; set; }
```

4.13. E3DOrthonormalAxisSystem Class

E3DOrthonormalAxisSystem is a subassembly of E3DAxisSystem with properties Orthogonal and Normed

Base Class:E3DAxisSystem

Namespace: Euresys.Open_eVision.Easy3D

Methods

E3DOrthonormalAxisSystem	Constructs an E3DOrthonormalAxisSystem.
operator=	Assignment operator.

E3DOrthonormalAxisSystem.E3DOrthonormalAxisSystem

Constructs an E3DOrthonormalAxisSystem.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void E3DOrthonormalAxisSystem(
 )
void E3DOrthonormalAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DAxisSystem other
 )
```

```
void E3DOrthonormalAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DOrthonormalAxisSystem other
 )
void E3DOrthonormalAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DPoint Origin,
 Euresys.Open_eVision.Easy3D.E3DPoint axisX,
 Euresys.Open_eVision.Easy3D.E3DPoint axisY,
 Euresys.Open_eVision.Easy3D.E3DPoint axisZ
 )
```

Parameters

other
Reference to another E3DOrthonormalAxisSystem used for the initialization.

Origin
The origin of the axis system

axisX
The X axis

axisY
The Y axis

axisZ
The Z axis

Remarks

throws an exception if the axis are not orthogonal and normed

E3DOrthonormalAxisSystem.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DOrthonormalAxisSystem operator=(
 Euresys.Open_eVision.Easy3D.E3DOrthonormalAxisSystem other
 )
```

Parameters

other
The source E3DOrthonormalAxisSystem.

4.14. E3DPlane Class

Represents a 3D plane.
The equation of the plane is "n_vect . (x,y,z) = signedDistance" where "n_vect" is the normal vector and "signedDistance" is the signed distance from the origin to the plane.
The signed distance is positive when the vector binding the origin to the closest point on the plane has the same direction as "n_vect" and is negative when this vector has the opposite direction as "n_vect".

Namespace: Euresys.Open_eVision.Easy3D

Properties

Normal	Gets/Sets the normal vector of the plane.
SignedDistanceFromOrigin	Gets/Sets the signed distance between the origin and the plane.

Methods

AngleWithPlane	Returns the angle (in the first quadrant) between the normals of this plane and the one passed in argument.
Define	(re)Defines the plane parameters: It is possible to use the normal and the signed distance of the plane. In that case, it exits with an exception if the normal vector is the null vector. It is also possible to use 3 points of the plane. In that case, it exits with an exception if the 3 points are aligned.
DistanceTo	Returns the signed distance between the plane and a given point. A positive distance means that the vector connecting the plane to the point has the same direction as the normal while a negative distance means that it has the opposite direction.
E3DPlane	Creates an E3DPlane object. It is possible to initialize it by specifying its normal and signed distance from the origin. In that case, it exits with an exception if the norm of the normal is null. It is also possible to initialize it by specifying 3 points of the plane. In that case, it exits with an exception if the 3 points are aligned.
GetTransformationTo	Return the transformation that moves the plane to the given destination plane.
IntersectionWithTwoPlanes	Compute the intersection between this plane and the two given as argument. If the intersection exists, true is returned and intersection is filled with the intersection.
Load	Loads a E3DPlane. The given ESerializer must have been created for reading.
operator-	Operator "-": returns a new E3DPlane translated in the inverse of the direction of the normal to the plane.

operator+	Operator "+": returns a new E3DPlane translated in the direction of the normal to the plane.
operator=	Assignment operator
ProjectPoint	Returns the position of the given point projected on the plane.
Save	Saves a E3DPlane. The given ESerializer must have been created for writing.
Transform	Transforms the 3D plane with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only).
XPlane	The X=0 plane.
YPlane	The Y=0 plane.
ZPlane	The Z=0 plane.

E3DPlane.AngleWithPlane

Returns the angle (in the first quadrant) between the normals of this plane and the one passed in argument.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float AngleWithPlane(
 Euresys.Open_eVision.Easy3D.E3DPlane other
 )
```

Parameters

other

The plane with respect to which we compute our angle

Remarks

This function does not take the orientation of the normals into account, i.e. (0, 0, 1) and (0, 0, -1) will give the same angle

E3DPlane.Define

(re)Defines the plane parameters:
It is possible to use the normal and the signed distance of the plane.
In that case, it exits with an exception if the normal vector is the null vector.
It is also possible to use 3 points of the plane.
In that case, it exits with an exception if the 3 points are aligned.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Define(
 Euresys.Open_eVision.Easy3D.E3DPoint normal,
 float signedDistance
 )
void Define(
 Euresys.Open_eVision.Easy3D.E3DPoint point1,
 Euresys.Open_eVision.Easy3D.E3DPoint point2,
 Euresys.Open_eVision.Easy3D.E3DPoint point3
 )
```

Parameters

normal

The normal vector, represented by an E3DPoint.

signedDistance

The signed distance between the origin and the plane.

point1

First point.

point2

Second point.

point3

Third point.

Remarks

When we define a plane by specifying 3 points, the normal vector always points toward the positive Z.

E3DPlane.DistanceTo

Returns the signed distance between the plane and a given point.
A positive distance means that the vector connecting the plane to the point has the same direction as the normal while a negative distance means that it has the opposite direction.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float DistanceTo(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The 3D point to measure the distance to.

E3DPlane.E3DPlane

Creates an E3DPlane object.
It is possible to initialize it by specifying its normal and signed distance from the origin.
In that case, it exits with an exception if the norm of the normal is null.
It is also possible to initialize it by specifying 3 points of the plane.
In that case, it exits with an exception if the 3 points are aligned.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DPlane(
 )
void E3DPlane(
 Euresys.Open_eVision.Easy3D.E3DPoint normal,
 float signedDistance
 )
void E3DPlane(
 Euresys.Open_eVision.Easy3D.E3DPoint point1,
 Euresys.Open_eVision.Easy3D.E3DPoint point2,
 Euresys.Open_eVision.Easy3D.E3DPoint point3
 )
void E3DPlane(
 Euresys.Open_eVision.Easy3D.E3DPlane other
 )
```

Parameters

normal
The normal vector. May not be null.

signedDistance
The signed distance from the origin to the plane.

point1
First point

point2
Second point

point3
Third point

other
Reference to the plane used for the initialization.

Remarks

When we define a plane by specifying 3 points, the normal vector always points toward the positive Z.

E3DPlane.GetTransformationTo

Return the transformation that moves the plane to the given destination plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix GetTransformationTo(
 Euresys.Open_eVision.Easy3D.E3DPlane destination
 )
```

Parameters

destination

The destination plane.

E3DPlane.IntersectionWithTwoPlanes

Compute the intersection between this plane and the two given as argument. If the intersection exists, true is returned and intersection is filled with the intersection.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IntersectionWithTwoPlanes(
 Euresys.Open_eVision.Easy3D.E3DPlane plane1,
 Euresys.Open_eVision.Easy3D.E3DPlane plane2,
 out Euresys.Open_eVision.Easy3D.E3DPoint intersection
 )
```

Parameters

plane1

The first plane with which we compute the intersection.

plane2

The second plane with which we compute the intersection.

intersection

The point that will contain the intersection between the three planes.

E3DPlane.Load

Loads a E3DPlane. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DPlane.Normal

Gets/Sets the normal vector of the plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint Normal
  { get; set; }
```

Remarks

Normal values will be stored normalized.

E3DPlane.operator-

Operator "-": returns a new E3DPlane translated in the inverse of the direction of the normal to the plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane operator-(
 float offset
 )
```

Parameters

offset

offset value

E3DPlane.operator+

Operator "+": returns a new E3DPlane translated in the direction of the normal to the plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane operator+(
 float offset
 )
```

Parameters

offset

offset value

E3DPlane.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane operator=(
 Euresys.Open_eVision.Easy3D.E3DPlane other
 )
```

Parameters

other

The E3DPlane object that should be copied.

E3DPlane.ProjectPoint

Returns the position of the given point projected on the plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint ProjectPoint(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The 3D point to project on plane.

E3DPlane.Save

Saves a E3DPlane. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

E3DPlane.SignedDistanceFromOrigin

Gets/Sets the signed distance between the origin and the plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float SignedDistanceFromOrigin
  { get; set; }
```

E3DPlane.Transform

Transforms the 3D plane with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane Transform(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

The 3D transformation matrix.

E3DPlane.XPlane

The X=0 plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane XPlane(
 )
```

E3DPlane.YPlane

The Y=0 plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane YPlane(
 )
```

E3DPlane.ZPlane

The Z=0 plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane ZPlane(
 )
```

4.15. E3DRightOrthonormalAxisSystem Class

E3DRightOrthonormalAxisSystem is a subassembly of E3DAxisSystem with properties Orthogonal and Normed and Right

Base Class:E3DAxisSystem

Namespace: Euresys.Open_eVision.Easy3D

Methods

E3DRightOrthonormalAxisSystem	Constructs an E3DRightOrthonormalAxisSystem.
operator=	Assignment operator.

E3DRightOrthonormalAxisSystem.E3DRightOrthonormalAxisSystem

Constructs an E3DRightOrthonormalAxisSystem.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DRightOrthonormalAxisSystem(
 )
void E3DRightOrthonormalAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DAxisSystem other
 )
void E3DRightOrthonormalAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DRightOrthonormalAxisSystem other
 )
void E3DRightOrthonormalAxisSystem(
 Euresys.Open_eVision.Easy3D.E3DPoint Origin,
 Euresys.Open_eVision.Easy3D.E3DPoint axisX,
 Euresys.Open_eVision.Easy3D.E3DPoint axisY,
 Euresys.Open_eVision.Easy3D.E3DPoint axisZ
 )
```

Parameters

other
Reference to another E3DRightOrthonormalAxisSystem used for the initialization.

Origin
The origin of the axis system

axisX
The X axis

axisY
The Y axis

axisZ
The Z axis

Remarks

throws an exception if the axis are not orthogonal and normed and right

E3DRightOrthonormalAxisSystem.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DRightOrthonormalAxisSystem operator=(
 Euresys.Open_eVision.Easy3D.E3DRightOrthonormalAxisSystem other
 )
```

Parameters

other

The source E3DRightOrthonormalAxisSystem.

4.16. E3DSphere Class

Represents a 3D sphere.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Center	Gets the center point of the sphere.
Radius	Gets the radius of the sphere.

Methods

Define	(re)Defines the sphere parameters: It is possible to use the center and the radius of the sphere.
DistanceTo	Computes the distance between a E3DPoint and the sphere, defined as the distance to the nearest point of the sphere.
E3DSphere	Creates an E3DSphere object. It is possible to initialize it by specifying its center and radius.
GenerateMesh	-
Load	Loads a E3DSphere. The given ESerializer must have been created for reading.
operator=	Assignment operator
Save	Saves a E3DSphere. The given ESerializer must have been created for writing.
Transform	Transforms the 3D sphere with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only).

E3DSphere.Center

Gets the center point of the sphere.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint Center
  { get; }
```

E3DSphere.Define

(re)Defines the sphere parameters:
It is possible to use the center and the radius of the sphere.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Define(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float radius
 )
```

Parameters

center

The center of the sphere.

radius

The radius of the sphere.

E3DSphere.DistanceTo

Computes the distance between a E3DPoint and the sphere, defined as the distance to the nearest point of the sphere.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float DistanceTo(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The 3D point to measure the distance to.

E3DSphere.E3DSphere

Creates an E3DSphere object.
It is possible to initialize it by specifying its center and radius.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DSphere(
 )
```

```
void E3DSphere(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float radius
 )
void E3DSphere(
 Euresys.Open_eVision.Easy3D.E3DSphere other
 )
```

Parameters

center

The center of the sphere.

radius

The radius of the sphere.

other

-

E3DSphere.GenerateMesh

-

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EMesh GenerateMesh(
 int subdivision,
 ref float distanceToSphere
 )
```

Parameters

subdivision

-

distanceToSphere

-

E3DSphere.Load

Loads a E3DSphere. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
```

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

E3DSphere.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DSphere operator=(
 Euresys.Open_eVision.Easy3D.E3DSphere other
 )
```

Parameters

other
The E3DSphere object that should be copied.

E3DSphere.Radius

Gets the radius of the sphere.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Radius
  { get; }
```

E3DSphere.Save

Saves a E3DSphere. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

E3DSphere.Transform

Transforms the 3D sphere with the given transformation matrix. The transformation matrix must contain a rigid transformation (translation and rotation only).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DSphere Transform(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

The 3D transformation matrix.

4.17. E3DTransformMatrix Class

Represents a 3D transformation [4x4] matrix.

Namespace: Euresys.Open_eVision.Easy3D

Properties

EulerAngles	Gets the Euler angles for the rotation represented by this transformation. The returned value is a 3D point with Euler angles around X, Y and Z axis. The E3DTransformMatrix must be rigid (translation and rotation only).

Methods

CreateAnisotropicScalingMatrix	Creates an anisotropic scaling E3DTransformMatrix.
CreateIdentityMatrix	Creates an identity (neutral) E3DTransformMatrix.

CreateIsotropicScalingMatrix	Creates an isotropic scaling E3DTransformMatrix.
CreateOrthoBasis	Creates a orthonormal E3DTransformMatrix basis (corresponds to a rigid transformation). The vector e1, e2, e3 should form a right-handed orthogonal basis.
CreateOrthographicProjectionMatrix	Creates an orthographic projection E3DTransformMatrix.
CreatePerspectiveProjectionMatrix	Creates a perspective projection E3DTransformMatrix.
CreateRotationMatrix	Creates a rotation E3DTransformMatrix around the given axis for the given angle.
CreateRotationXMatrix	Creates a rotation E3DTransformMatrix around the X axis matrix.
CreateRotationYMatrix	Creates a rotation E3DTransformMatrix around the Y axis matrix.
CreateRotationZMatrix	Creates a rotation E3DTransformMatrix around the Z axis matrix.
CreateTranslationMatrix	Creates a translation E3DTransformMatrix.
E3DTransformMatrix	Creates an E3DTransformMatrix object.
GetAzimuthElevationAngles	Gets the azimuth and elevation angles for the Z axis of the coordinate system represented by the transformation matrix. Azimuth angle is oriented trigonometrically around the z axis. The x axis corresponds to an azimuth of 0 degrees. Elevation angle represents the height of the normal w.r.t. the z = 0 plane. The E3DTransformMatrix must be rigid (translation and rotation only).
GetOrthoBasis	Gets the orthogonal basis represented by this transformation or throws an exception if it is not a rigid transformation.
GetValue	Gets a value from the E3DTransformMatrix object.
Inverse	Returns the inverted E3DTransformMatrix. An exception will be thrown if the determinant of the matrix is 0.
IsRigid	Checks that the transformation is a rigid transformation (keep the distances and angles).
Load	Loads the E3DTransformMatrix object. The given ESerializer must have been created for reading.
operator-	E3DTransformMatrix difference. Subtract the current and the given matrix, returns the result.
operator!=	Checks if two E3DTransformMatrix objects are strictly different (binary level).
operator*	E3DTransformMatrix product. Combines the transformations of the two matrices.
operator+	E3DTransformMatrix sum. Sums the current and the given matrix, returns the result.
operator=	Assignment operator.

operator==	Checks if two E3DTransformMatrix objects are strictly equals (binary level).
Save	Saves the E3DTransformMatrix object. The given ESerializer must have been created for writing.
SetValue	Sets a value in the E3DTransformMatrix object.
Transpose	Returns the transposed E3DTransformMatrix. If the matrix is orthogonal (rotation only transformation), the transposed matrix is the inverse transformation.

E3DTransformMatrix.CreateAnisotropicScalingMatrix

Creates an anisotropic scaling E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateAnisotropicScalingMatrix(
 float scaleX,
 float scaleY,
 float scaleZ
 )
```

Parameters

scaleX
Scaling factor along the X axis.

scaleY
Scaling factor along the Y axis.

scaleZ
Scaling factor along the Z axis.

E3DTransformMatrix.CreateIdentityMatrix

Creates an identity (neutral) E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateIdentityMatrix(
 )
```

E3DTransformMatrix.CreateIsotropicScalingMatrix

Creates an isotropic scaling E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateIsotropicScalingMatrix(
 float scale
 )
```

Parameters

scale

Scaling factor.

E3DTransformMatrix.CreateOrthoBasis

Creates a orthonormal E3DTransformMatrix basis (corresponds to a rigid transformation). The vector e1, e2, e3 should form a right-handed orthogonal basis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateOrthoBasis(
 Euresys.Open_eVision.Easy3D.E3DPoint e1,
 Euresys.Open_eVision.Easy3D.E3DPoint e2,
 Euresys.Open_eVision.Easy3D.E3DPoint e3,
 Euresys.Open_eVision.Easy3D.E3DPoint t
 )
```

Parameters

e1

Vector 1.

e2

Vector 2.

e3

Vector 3.

t

Translation.

E3DTransformMatrix.CreateOrthographicProjectionMatrix

Creates an orthographic projection E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateOrthographicProjectionMatrix(
 float width,
 float height
 )
```

Parameters

width
Width of the viewport.

height
Height of the viewport.

E3DTransformMatrix.CreatePerspectiveProjectionMatrix

Creates a perspective projection E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreatePerspectiveProjectionMatrix(
 float distance,
 float width,
 float height
 )
```

Parameters

distance
Distance of the viewport to the origin.

width
Width of the viewport.

height
Height of the viewport.

E3DTransformMatrix.CreateRotationMatrix

Creates a rotation E3DTransformMatrix around the given axis for the given angle.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationMatrix(
 Euresys.Open_eVision.Easy3D.E3DPoint axis,
 float angle
 )
```

Parameters

axis
Rotation axis.

angle
Rotation angle.

E3DTransformMatrix.CreateRotationXMatrix

Creates a rotation E3DTransformMatrix around the X axis matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationXMatrix(
 float angle
 )
```

Parameters

angle

Rotation angle.

E3DTransformMatrix.CreateRotationYMatrix

Creates a rotation E3DTransformMatrix around the Y axis matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationYMatrix(
 float angle
 )
```

Parameters

angle

Rotation angle.

E3DTransformMatrix.CreateRotationZMatrix

Creates a rotation E3DTransformMatrix around the Z axis matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationZMatrix(
 float angle
 )
```

Parameters

angle

Rotation angle.

E3DTransformMatrix.CreateTranslationMatrix

Creates a translation E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateTranslationMatrix(
 float dX,
 float dY,
 float dZ
 )
```

Parameters

dX

Translation along the X axis.

dY

Translation along the Y axis.

dZ

Translation along the Z axis.

E3DTransformMatrix.E3DTransformMatrix

Creates an E3DTransformMatrix object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DTransformMatrix(
 )
void E3DTransformMatrix(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix other
 )
```

```
void E3DTransformMatrix(
 double m00,
 double m10,
 double m20,
 double m30,
 double m01,
 double m11,
 double m21,
 double m31,
 double m02,
 double m12,
 double m22,
 double m32,
 double m03,
 double m13,
 double m23,
 double m33
 )
```

Parameters

other
Another E3DTransformMatrix used for the initialization.

m00
Matrix value line 0 column 0.

m10
Matrix value line 0 column 1.

m20
Matrix value line 0 column 2.

m30
Matrix value line 0 column 3.

m01
Matrix value line 1 column 0.

m11
Matrix value line 1 column 1.

m21
Matrix value line 1 column 2.

m31
Matrix value line 1 column 3.

m02
Matrix value line 2 column 0.

m12
Matrix value line 2 column 1.

m22
Matrix value line 2 column 2.

m32
Matrix value line 2 column 3.

m03
Matrix value line 3 column 0.
m13
Matrix value line 3 column 1.
m23
Matrix value line 3 column 2.
m33
Matrix value line 3 column 3.

Remarks

The matrix is initialized with the given values.
By default, the matrix is initialized as an identity (neutral) matrix.
The value indices are m(column, row).

E3DTransformMatrix.EulerAngles

Gets the Euler angles for the rotation represented by this transformation. The returned value is a 3D point with Euler angles around X, Y and Z axis. The E3DTransformMatrix must be rigid (translation and rotation only).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint EulerAngles
  { get; }
```

E3DTransformMatrix.GetAzimuthElevationAngles

Gets the azimuth and elevation angles for the Z axis of the coordinate system represented by the transformation matrix.
Azimuth angle is oriented trigonometrically around the z axis. The x axis corresponds to an azimuth of 0 degrees.
Elevation angle represents the height of the normal w.r.t. the z = 0 plane.
The E3DTransformMatrix must be rigid (translation and rotation only).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetAzimuthElevationAngles(
 out float azimuth,
 out float elevation
 )
```

Parameters

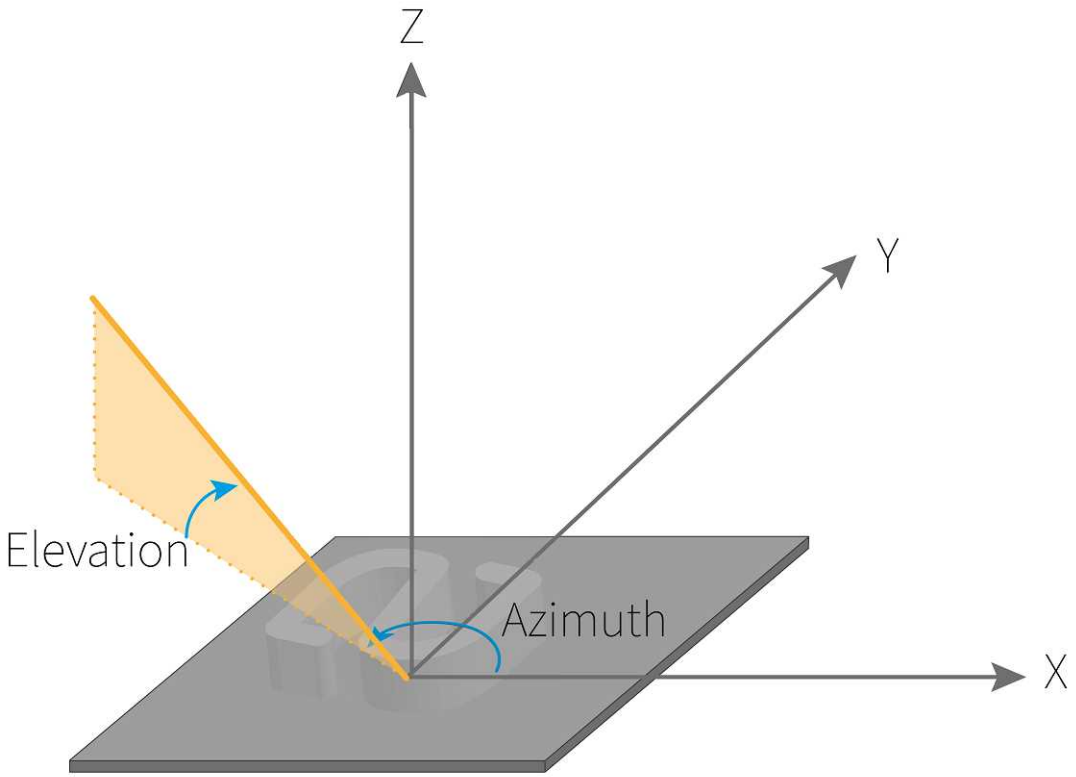
azimuth

The returned azimuth angle.

elevation

The returned elevation angle.

Remarks



E3DTransformMatrix.GetOrthoBasis

Gets the orthogonal basis represented by this transformation or throws an exception if it is not a rigid transformation.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetOrthoBasis(
 out Euresys.Open_eVision.Easy3D.E3DPoint e1,
 out Euresys.Open_eVision.Easy3D.E3DPoint e2,
 out Euresys.Open_eVision.Easy3D.E3DPoint e3,
 out Euresys.Open_eVision.Easy3D.E3DPoint t
 )
```

Parameters

e1
Vector 1.

e2
Vector 2.

e3
Vector 3.

t
Translation.

E3DTransformMatrix.GetValue

Gets a value from the E3DTransformMatrix object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float GetValue(
 uint column,
 uint row
 )
```

Parameters

column
Column of the value to get, from 0 to 3.

row
Row of the value to get, from 0 to 3.

E3DTransformMatrix.Inverse

Returns the inverted E3DTransformMatrix.
An exception will be thrown if the determinant of the matrix is 0.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Inverse(
 )
```

E3DTransformMatrix.IsRigid

Checks that the transformation is a rigid transformation (keep the distances and angles).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsRigid(
 )
```

E3DTransformMatrix.Load

Loads the E3DTransformMatrix object. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

E3DTransformMatrix.operator-

E3DTransformMatrix difference. Subtract the current and the given matrix, returns the result.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix operator-(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

Matrix to subtract from the current matrix.

E3DTransformMatrix.operator!=

Checks if two E3DTransformMatrix objects are strictly different (binary level).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator!=(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix other
 )
```

Parameters

other

The other matrix.

E3DTransformMatrix.operator*

E3DTransformMatrix product. Combines the transformations of the two matrices.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix operator*(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
Euresys.Open_eVision.Easy3D.E3DPoint operator*(
 Euresys.Open_eVision.Easy3D.E3DPoint P
 )
```

Parameters

matrix

Matrix to combine with the current matrix.

P

Point to transform with the current matrix.

E3DTransformMatrix.operator+

E3DTransformMatrix sum. Sums the current and the given matrix, returns the result.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix operator+(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

Matrix to add with the current matrix.

E3DTransformMatrix.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix operator=(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix other
 )
```

Parameters

other

An other E3DTransformMatrix.

E3DTransformMatrix.operator==

Checks if two E3DTransformMatrix objects are strictly equals (binary level).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix other
 )
```

Parameters

other

The other matrix.

E3DTransformMatrix.Save

Saves the E3DTransformMatrix object. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

E3DTransformMatrix.SetValue

Sets a value in the E3DTransformMatrix object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetValue(
 uint column,
 uint row,
 float value
 )
```

Parameters

column
Column of the value to set, from 0 to 3.

row
Row of the value to set, from 0 to 3.

value
Value to set.

E3DTransformMatrix.Transpose

Returns the transposed E3DTransformMatrix.
If the matrix is orthogonal (rotation only transformation), the transposed matrix is the inverse transformation.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Transpose(
 )
```

4.18. E3DViewer Class

Manages a viewer window for EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisOrigin	Sets and Gets the axis origin mode.
BackgroundColor	Sets/Gets the 3D viewer background color.
ColorRampGraduationColor	Sets/Gets the graduation color.
ColorRampMode	Set/Gets the current color ramp mode.
EDLShadingFactor	Gets/Sets how strong Eye-Dome-Lighting shading is. In this mode, every pixel is shaded by how much closer its neighbor pixels are to the camera.
EnableEDLShading	Gets/Sets if Eye-Dome-Lighting shading mode is enabled. In this mode, every pixel is shaded by how much closer its neighbor pixels are to the camera.
EnableFixColorRampBounds	Gets the state of the fix color ramp bounds.
EnableSmartColorRamp	Sets/Gets the state of the smart generation of color. If the smart generation of color is active, then the outliers inside the pointcloud will not be taken into account in the color ramp.
FieldOfView	Sets/Gets the field of view.
FontPath	Configure the TrueType font used to display text on the 3D Viewer
LastPickedPoint	Returns the last picked E3DPoint if there is one. Otherwise, it throws an EException.
NumRenderSources	Returns the number of render sources.
PickingDisplay	Enables or disables the display of the picked point.
PickingDistanceThreshold	Sets or gets the distance threshold for the picking.
PickingLabelColor	Sets or gets the color of the picked point label.
PickingLabelFixed	Sets or gets the state to fix or not the label.
PickingLabelSize	Sets or gets the size of the picked point label.
PointSize	Displays size of the points, in pixels.
ProjectionType	Sets/Gets the projection type.
RenderAxis	Enables or disables the display of the axis.
RenderAxisConfiguration	Sets/Gets the axis configuration.
RenderDecimationLevel	Sets or Gets the point cloud decimation level used during the rendering.
RenderGrid	Enables or disables the display of Grid.
RenderGridStep	Sets/Gets the same grid step for each axis.
ViewDistance	Sets/Gets view distance.
WireframeMode	Enables or disables the display of wireframe triangles.

Methods

AddRenderSource	Adds a new Render Source. The given render source (point cloud, mesh, ZMap, sphere, box, plane or line) is added to the current display.
AddTextLabel	Adds a text label linked to an E3DPoint.
ClearRenderSource	Clears the 3D data, nothing will be displayed.
ClearTextLabels	Removes all text labels.
ConfigureRenderSource	Sets a unique 3D source to be rendered. It replaces the current object.
DecPointSize	Decreases the displayed point size.
DisableFixColorRampBounds	Disables the fix color ramp bounds.
E3DViewer	Creates an E3DViewer object.
EditTextLabel	Edits a text label.
GenerateColors	Choose the current color ramp mode. Colors are calculated from point coordinates or attributes, several mappings are exposed in EColorRampMode.
GetAutoRotate	Gets the auto rotate speeds.
GetColorRampLocation	Gets the location of the color ramp.
GetFeatureStyleFor3DObject	Gets how the E3DObjectFeature of the registered E3DObject at the specified location idx should be rendered.
GetFixColorRampBounds	Gets the bounds of the color ramp.
GetRenderSourceColorMode	Gets the Source Color Mode. The Source Color Mode defines how the colors of the point cloud or mesh are chosen. See ESourceColorMode.
GetRenderSourceConstantColor	Gets the constant color used to display a point cloud or a mesh, when ESourceColorMode is set to Constant.
GetRenderSourceName	Returns the name of the ith render source.
GetRenderSourceOpacity	Gets the opacity used to display the render source. Only compatible with Constant.
GetRenderSourcePointSize	Gets the point size used to display the point clouds.
GetRenderSourceWireFrame	Gets the wireframe mode used to render a mesh.
GetRenderSourceWireFrameColor	Gets the wireframe color.
GetRotationMatrix	Gets the view rotation matrix.
GetTextLabel	Gets the text label information.
GetViewAngle	Gets view angles.
GetViewTarget	Gets view target position (by default, the camera position is 'look at center of the point cloud').

Has3DObjects	Return true if at least one 3D object is registered
HasRenderSource	Is the given render source name exists ?
HideColorRampLegend	Disables the display of a color ramp legend.
HideFeatureFor3DObject	Sets the E3DObjectFeature of the registered E3DObject at the specified location idx to be not rendered.
HideFeatureForAll3DObjects	Sets the E3DObjectFeature of all the registered E3DObject to be not rendered.
HideRenderSource	Hides the given render source.
IncPointSize	Increases the displayed point size.
InitRendering	Initializes the rendering state, must be called one time before the first E3DViewer::Show.
IsAutoRotate	Returns true if the auto rotation is active.
IsColorRampLegendVisible	Whether the color ramp legend is visible or not.
IsEDLShadingSupported	Indicates whether Eye-Dome-Lighting shading mode is supported.
IsFeatureVisibleFor3DObject	Whether the E3DObjectFeature of the registered E3DObject si rendered or not.
IsRenderSourceVisible	Returns true if the render source is currently visible.
LockRotationFinalPosition	Finalizes a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is released.
LockRotationInitialPosition	Starts a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is pressed.
LockTranslationFinalPosition	Finalizes a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is released.
LockTranslationInitialPosition	Starts a translation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is pressed.
Pick3DPoint	Returns and displays the picked E3DPoint in the EPointCloud.
Register3DObjects	Sets the list of E3DObject from which their features can be rendered.
RemoveAllRenderSources	Removes all render sources. The E3DViewer display will be empty.
RemoveCurrent3DObjects	Removes all E3DObject currently registered.
RemoveRenderSource	Removes the given render source.
RemoveTextLabel	Removes a text label.
ResetPicking	Resets the last picked point and disable the coordinate display.
ResetView	Resets the view point to a view that frame the object.

Resize	Update the size of the 3D viewer window.
SetAutoRotate	Enables and configures the auto rotate display.
SetColorRampLocation	Sets the location of the color ramp.
SetFeatureStyleFor3DObject	Sets how the E3DObjectFeature of the registered E3DObject at the specified location idx should be rendered.
SetFeatureStyleForAll3DObjects	Sets how the E3DObjectFeature of all the registered E3DObject should be rendered.
SetFixColorRampBounds	Sets the bounds of the color ramp.
SetFocus	The viewer window takes the focus.
SetPickedPointCallBack	Sets a callback function that will be called when a new E3DPoint is picked.
SetPosition	Sets the position of the 3D viewer window.
SetRenderSource	Changes the content of a render source with a new point cloud, mesh or ZMap.
SetRenderSourceColorMode	Sets the Source Color Mode. The Source Color Mode defines how the colors of the point cloud or mesh are chosen. See ESourceColorMode.
SetRenderSourceConstantColor	Sets the constant color used to display a point cloud or a mesh, when ESourceColorMode is set to Constant.
SetRenderSourceOpacity	Sets the opacity used to display the render source. Only compatible with Constant.
SetRenderSourcePointSize	Sets the point size used to display the point clouds.
SetRenderSourceWireFrame	Sets the wireframe mode used to render a mesh.
SetRenderSourceWireFrameColor	Sets the wireframe color.
SetRotationMatrix	Sets the view rotation matrix.
SetViewAngle	Sets view angles.
SetViewTarget	Sets view target position (by default, the camera position is 'look at center of the point cloud').
Show	Shows the viewer window, refresh the display.
ShowColorRampLegend	Enables the display of a color ramp legend.
ShowFeatureFor3DObject	Sets the E3DObjectFeature of the registered E3DObject at the specified location idx to be rendered.
ShowFeatureForAll3DObjects	Sets the E3DObjectFeature of all the registered E3DObject to be rendered.
ShowRenderSource	Shows the given render source.
StopAutoRotate	Stops the display automatic rotation
ToggleRenderAxis	Toggles the display of the axis.

ToggleWireframeMode	Toggles the display of wireframe triangles.
UpdateRotationPosition	Updates a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when the mouse moves.
UpdateTranslationPosition	Updates a translation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is pressed.
UpdateViewDistance	Applies a delta factor to the view distance. Usually this control is mapped on the mouse wheel.

E3DViewer.AddRenderSource

Adds a new Render Source. The given render source (point cloud, mesh, ZMap, sphere, box, plane or line) is added to the current display.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.EPointCloud source
 )

void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.EMesh source
 )

void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.EZMap source
 )

void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DSphere sphere,
 Euresys.Open_eVision.EC24 color,
 byte opacity
 )

void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DBox box,
 Euresys.Open_eVision.EC24 color,
 byte opacity
 )

void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DLine line,
 Euresys.Open_eVision.EC24 color
 )
```

```
void AddRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DPlane plane,
 Euresys.Open_eVision.EC24 color,
 byte opacity
 )
```

Parameters

name
A name for the render source, to be used to access and configure the render source.

source
An EPointCloud, EMesh or EZMap to be added as render source.

sphere
An E3DSphere to be added as render source.

color
The color of the E3DSphere, E3DBox, E3DLine or E3DPlane.

opacity
The opacity of the E3DSphere, E3DBox or E3DPlane.

box
An E3DBox to be added as render source.

line
An E3DLine to be added as render source.

plane
An E3DPlane to be added as render source.

E3DViewer.AddTextLabel

Adds a text label linked to an E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int AddTextLabel(
 Euresys.Open_eVision.Easy3D.TextLabel label
 )

int AddTextLabel(
 Euresys.Open_eVision.Easy3D.E3DPoint anchor,
 float posX,
 float posY,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 bool showAnchor,
 Euresys.Open_eVision.EC24A backgroundcolor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
```

```
int AddTextLabel(
 Euresys.Open_eVision.Easy3D.E3DPoint anchor,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 bool fixLabelPosition,
 bool showAnchor,
 Euresys.Open_eVision.EC24A backgroundcolor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
int AddTextLabel(
 float posX,
 float posY,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 Euresys.Open_eVision.EC24A backgroundcolor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
```

Parameters

label
The label to add.

anchor
The E3DPoint linked to the text label.

posX
The x coordinate of the text box. Value between -1 (left) and 1 (right).

posY
The y coordinate of the text box. Value between -1 (bottom) and 1 (top).

color
The color of the text label.

size
The size of the text font. Value between 0 et 1.

text
The text of the text label.

showAnchor
If set to true, a line is drawn between the anchor and the label (default: true).

backgroundcolor
If specified, the background of the label is set to this color (default: black).

alignment
-

fixLabelPosition
If set to true, the label stays fixed when the view changes (default: false).

Remarks

See also E3DViewer::EditTextLabel. and E3DViewer::GetTextLabel.

Deprecation notice: The overloads taking multiple arguments are deprecated.

E3DViewer.AxisOrigin

Sets and Gets the axis origin mode.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EAxisOriginMode AxisOrigin
  { get; set; }
```

Remarks

The default mode is EAxisOriginMode.

E3DViewer.BackgroundColor

Sets/Gets the 3D viewer background color.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERGBColor BackgroundColor
  { get; set; }
```

E3DViewer.ClearRenderSource

Clears the 3D data, nothing will be displayed.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ClearRenderSource(
 )
```

Remarks

See also E3DViewer::ConfigureRenderSource

E3DViewer.ClearTextLabels

Removes all text labels.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ClearTextLabels(
 )
```

E3DViewer.ColorRampGraduationColor

Sets/Gets the graduation color.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.ERGBColor ColorRampGraduationColor
   { get; set; }
```

Remarks

The default color is white.

E3DViewer.ColorRampMode

Set/Gets the current color ramp mode.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EColorRampMode ColorRampMode
   { get; set; }
```

E3DViewer.ConfigureRenderSource

Sets a unique 3D source to be rendered. It replaces the current object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ConfigureRenderSource(
 Euresys.Open_eVision.Easy3D.EZMap sourceObject,
 bool keepCurrentView
 )
void ConfigureRenderSource(
 Euresys.Open_eVision.Easy3D.EPointCloud sourceObject,
 bool keepCurrentView
 )
```

```
void ConfigureRenderSource(
 Euresys.Open_eVision.Easy3D.EMesh sourceObject,
 bool keepCurrentView
 )
void ConfigureRenderSource(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceObject,
 bool keepCurrentView
 )
void ConfigureRenderSource(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceObject,
 bool keepCurrentView
 )
void ConfigureRenderSource(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceObject,
 bool keepCurrentView
 )
```

Parameters

sourceObject

A 3D source (EPointCloud, EMesh, EZMap) to render.

keepCurrentView

An optional boolean, use true to keep the current view or false to reset the view and center the new object.
The default value resets the view.

Remarks

For display performance purposes, the object geometry is copied into the viewer.
Subsequent modifications on the object will thus not be visible until a new call to E3DViewer::ConfigureRenderSource has been made.
The initial viewing position looks at the object center.

E3DViewer.DecPointSize

Decreases the displayed point size.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DecPointSize(
 )
```

E3DViewer.DisableFixColorRampBounds

Disables the fix color ramp bounds.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DisableFixColorRampBounds(
 )
```

Remarks

See also E3DViewer

E3DViewer.E3DViewer

Creates an E3DViewer object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DViewer(
 int orgX,
 int orgY,
 int width,
 int height,
 IntPtr parent
 )

void E3DViewer(
 Euresys.Open_eVision.Easy3D.EUIAPI uiApi,
 int orgX,
 int orgY,
 int width,
 int height,
 IntPtr parent
 )

void E3DViewer(
 Euresys.Open_eVision.Easy3D.EUIAPI uiApi
 )
```

Parameters

orgX

X coordinate of the top left corner of the viewer window (only if uiApi is EUIAPI_Win32).

orgY

Y coordinate of the top left corner of the viewer window (only if uiApi is EUIAPI_Win32).

width

Width of the viewer window (only if uiApi is EUIAPI_Win32).

height

Height of the viewer window (only if uiApi is EUIAPI_Win32).

parent

Handle of the parent window of the viewer. If NULL, the viewer is built as a independent floating window (only if uiApi is EUIAPI_Win32).

uiApi

The User Interface API used by the parent application. See EUIAPI.

Remarks

The origin point (orgX, orgY) defines the offset of the top left corner of the viewer from the top left corner of its parent window client area.
If the window has no parent, it defines the offset from the top left corner of the screen.
If the parent window is too small to contain the viewer, the viewer will be cropped accordingly.

When the parent application that use E3DViewer is a Qt application, call the constructor with EUIAPI_Qt.

E3DViewer.EditTextLabel

Edits a text label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EditTextLabel(
 int id,
 Euresys.Open_eVision.Easy3D.TextLabel label
 )
void EditTextLabel(
 int id,
 float posX,
 float posY,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 bool showAnchor,
 Euresys.Open_eVision.EC24 backgroundcolor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
void EditTextLabel(
 int id,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 bool fixLabelPosition,
 bool showAnchor,
 Euresys.Open_eVision.EC24 backgroundcolor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
```

Parameters

id
The id of the text label to edit.
label
-
posX
The x coordinate of the text box. Value between -1 (left) and 1 (right).
posY
The y coordinate of the text box. Value between -1 (bottom) and 1 (top).
color
The color of the text label.
size
The size of the text font. Value between 0 et 1.
text
The text of the text label.
showAnchor
If set to true, a line is drawn between the anchor and the label (default: true).
backgroundcolor
If specified, the background of the label is set to this color (default: black).
alignment
-
fixLabelPosition
If set to true, the label stays fixed when the view changes (default: false).

Remarks

See also E3DViewer::AddTextLabel and E3DViewer::GetTextLabel.

Deprecation notice: The overloads taking more than two arguments are deprecated.

E3DViewer.EDLShadingFactor

Gets/Sets how strong Eye-Dome-Lighting shading is. In this mode, every pixel is shaded by how much closer its neighbor pixels are to the camera.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float EDLShadingFactor
  { get; set; }
```

Remarks

Factor value ranges between 0 and 1. 0 means no shading, 1 means the strongest shading.

E3DViewer.EnableEDLShading

Gets/Sets if Eye-Dome-Lighting shading mode is enabled. In this mode, every pixel is shaded by how much closer its neighbor pixels are to the camera.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableEDLShading
  { get; set; }
```

E3DViewer.EnableFixColorRampBounds

Gets the state of the fix color ramp bounds.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableFixColorRampBounds
  { get; }
```

Remarks

To enable fix color ramp bounds, use E3DViewer::SetFixColorRampBounds.

E3DViewer.EnableSmartColorRamp

Sets/Gets the state of the smart generation of color. If the smart generation of color is active, then the outliers inside the pointcloud will not be taken into account in the color ramp.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableSmartColorRamp
  { get; set; }
```

Remarks

Default: true. When set to true, fix color ramp bounds are disabled (see also E3DViewer::DisableFixColorRampBounds).

E3DViewer.FieldOfView

Sets/Gets the field of view.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float FieldOfView
  { get; set; }
```

Remarks

If the projection type is EProjectionType_Orthographic, the field of view is not taken into account. See also E3DViewer::ProjectionType. For the angle unit see Easy::AngleUnit.

E3DViewer.FontPath

Configure the TrueType font used to display text on the 3D Viewer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string FontPath
  { get; set; }
```

Remarks

Setup a font file must be done before the E3DViewer::InitRendering method is called.
By default, the TTF file is:
- on Windows: C:\\Windows\\Fonts\\Arial.ttf
- on Linux: /usr/share/fonts/liberation-sans/LiberationSans-Regular.ttf or
- /usr/share/fonts/truetype/liberation/LiberationSans-Regular.ttf" or
- /usr/share/fonts/truetype/noto/NotoMono-Regular.ttf"

E3DViewer.GenerateColors

This method is deprecated.

Choose the current color ramp mode. Colors are calculated from point coordinates or attributes, several mappings are exposed in EColorRampMode.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GenerateColors(
 Euresys.Open_eVision.Easy3D.EColorRampMode mode
 )
```

Parameters

mode

The color ramp mode from EColorRampMode.

Remarks

This method is deprecated in favor of E3DViewer.

E3DViewer.GetAutoRotate

Gets the auto rotate speeds.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetAutoRotate(
 out float vx,
 out float vy,
 out float vz
 )
```

Parameters

vx
Rotation speed around axis X.

vy
Rotation speed around axis Y.

vz
Rotation speed around axis Z.

E3DViewer.GetColorRampLocation

Gets the location of the color ramp.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetColorRampLocation(
 out float xmin,
 out float xmax,
 out float ymin,
 out float ymax
 )
```

Parameters

xmin
The left most coordinate of the color ramp.

xmax
The right most coordinate of the color ramp.

ymin
The bottom most coordinate of the color ramp.

ymax
The top most coordinate of the color ramp.

E3DViewer.GetFeatureStyleFor3DObject

Gets how the E3DObjectFeature of the registered E3DObject at the specified location idx should be rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ERenderStyle GetFeatureStyleFor3DObject(
 int idx,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

idx

the position in the list of registered E3DObject

feature

the feature

E3DViewer.GetFixColorRampBounds

Gets the bounds of the color ramp.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetFixColorRampBounds(
 out float min,
 out float max
 )
```

Parameters

min

Where the lowest value of the color ramp will be stored.

max

Where the highest value of the color ramp will be stored.

Remarks

See also E3DViewer::DisableFixColorRampBounds

E3DViewer.GetRenderSourceColorMode

Gets the Source Color Mode. The Source Color Mode defines how the colors of the point cloud or mesh are chosen. See ESourceColorMode.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ESourceColorMode GetRenderSourceColorMode(
 string name
 )
```

Parameters

name

The name of the render source to be considered.

Remarks

See also E3DViewer::GetRenderSourceConstantColor and E3DViewer::GenerateColors.

E3DViewer.GetRenderSourceConstantColor

Gets the constant color used to display a point cloud or a mesh, when ESourceColorMode is set to Constant.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EC24 GetRenderSourceConstantColor(
 string name
 )
```

Parameters

name

The name of the render source to be considered.

Remarks

See also E3DViewer::GetRenderSourceColorMode.

E3DViewer.GetRenderSourceName

Returns the name of the ith render source.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
string GetRenderSourceName(
 int index
 )
```

Parameters

index

The index of the render source to consider.

Remarks

The number of render sources is given by E3DViewer.

E3DViewer.GetRenderSourceOpacity

Gets the opacity used to display the render source. Only compatible with Constant.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
byte GetRenderSourceOpacity(
 string name
 )
```

Parameters

name

The name of the render source to be considered.

E3DViewer.GetRenderSourcePointSize

Gets the point size used to display the point clouds.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
int GetRenderSourcePointSize(
 string name
 )
```

Parameters

name

The name of the render source to be considered.

E3DViewer.GetRenderSourceWireFrame

Gets the wireframe mode used to render a mesh.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool GetRenderSourceWireFrame(
 string name
 )
```

Parameters

name

The name of the render source to be considered.

E3DViewer.GetRenderSourceWireFrameColor

Gets the wireframe color.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EC24 GetRenderSourceWireFrameColor(
 string name
 )
```

Parameters

name

The name of the render source to be considered.

E3DViewer.GetRotationMatrix

Gets the view rotation matrix.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetRotationMatrix(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

A matrix representing the view orientation.

E3DViewer.GetTextLabel

Gets the text label information.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.TextLabel GetTextLabel(
 int id
 )
void GetTextLabel(
 int id,
 out Euresys.Open_eVision.Easy3D.E3DPoint anchor,
 out float posX,
 out float posY,
 out Euresys.Open_eVision.EC24 color,
 out float size,
 out string text,
 out bool fixLabelPosition,
 out bool showAnchor,
 ref Euresys.Open_eVision.EC24A backgroundcolor
 )
void GetTextLabel(
 int id,
 out Euresys.Open_eVision.Easy3D.E3DPoint anchor,
 out float posX,
 out float posY,
 out Euresys.Open_eVision.EC24 color,
 out float size,
 out string text,
 out bool fixLabelPosition,
 out bool showAnchor
 )
```

Parameters

id
The id of the text label.

anchor
The E3DPoint linked to the text label.

posX
The x coordinate of the text box. Value between -1 (left) and 1 (right).

posY
The y coordinate of the text box. Value between -1 (bottom) and 1 (top).

color
The color of the text label.

size
The size of the text font. Value between 0 et 1.

text
The text of the text label.

fixLabelPosition
If set to true, the label stays fixed when the view changes (default: false).

showAnchor
If set to true, a line is drawn between the anchor and the label.

backgroundcolor

The background color of the label.

Remarks

See also E3DViewer::AddTextLabel and E3DViewer::EditTextLabel.

Deprecation notice: The overloads taking multiple arguments are deprecated.

E3DViewer.GetViewAngle

Gets view angles.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetViewAngle(
 out float angleX,
 out float angleY,
 out float angleZ
 )
```

Parameters

angleX

Rotation around the X axis.

angleY

Rotation around the Y axis.

angleZ

Rotation around the Z axis.

E3DViewer.GetViewTarget

Gets view target position (by default, the camera position is 'look at center of the point cloud').

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetViewTarget(
 out float targetX,
 out float targetY,
 out float targetZ
 )
```

Parameters

targetX
X axis target position.
targetY
Y axis target position.
targetZ
Z axis target position.

E3DViewer.Has3DObjects

Return true if at least one 3D object is registered

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool Has3DObjects(
 )
```

Remarks

See also E3DViewer::Register3DObjects.

E3DViewer.HasRenderSource

Is the given render source name exists ?

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool HasRenderSource(
 string name
 )
```

Parameters

name
The name of the render source to be checked.

E3DViewer.HideColorRampLegend

Disables the display of a color ramp legend.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void HideColorRampLegend(
 )
```

Remarks

See also E3DViewer::ShowColorRampLegend.

E3DViewer.HideFeatureFor3DObject

Sets the E3DObjectFeature of the registered E3DObject at the specified location idx to be not rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void HideFeatureFor3DObject(
 int idx,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

idx

the position in the list of registered E3DObject

feature

the feature

E3DViewer.HideFeatureForAll3DObjects

Sets the E3DObjectFeature of all the registered E3DObject to be not rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void HideFeatureForAll3DObjects(
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

feature

the feature

E3DViewer.HideRenderSource

Hides the given render source.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void HideRenderSource(
 string name
 )
```

Parameters

name

The name of the render source.

Remarks

See also E3DViewer::ShowRenderSource.

E3DViewer.IncPointSize

Increases the displayed point size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void IncPointSize(
 )
```

E3DViewer.InitRendering

Initializes the rendering state, must be called one time before the first E3DViewer::Show.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void InitRendering(
 )
```

E3DViewer.IsAutoRotate

Returns true if the auto rotation is active.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsAutoRotate(
 )
```

E3DViewer.IsColorRampLegendVisible

Whether the color ramp legend is visible or not.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsColorRampLegendVisible(
 )
```

Remarks

See also E3DViewer::ShowColorRampLegend and E3DViewer::HideColorRampLegend.

E3DViewer.IsEDLShadingSupported

Indicates whether Eye-Dome-Lighting shading mode is supported.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsEDLShadingSupported(
 )
```

Remarks

Support of Eye-Dome-Lighting shading is detected when E3DViewer::InitRendering is called. Before, this method will always return false.

E3DViewer.IsFeatureVisibleFor3DObject

Whether the E3DObjectFeature of the registered E3DObject si rendered or not.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsFeatureVisibleFor3DObject(
 int idx,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

idx

the position in the list of registered E3DObject

feature

the feature

E3DViewer.IsRenderSourceVisible

Returns true if the render source is currently visible.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsRenderSourceVisible(
 string name
 )
```

Parameters

name

The name of the render source to be queried.

Remarks

See also E3DViewer::ShowRenderSource and E3DViewer::HideRenderSource.

E3DViewer.LastPickedPoint

Returns the last picked E3DPoint if there is one. Otherwise, it throws an EException.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint LastPickedPoint
  { get; }
```

E3DViewer.LockRotationFinalPosition

Finalizes a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is released.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LockRotationFinalPosition(
 int x,
 int y
 )
```

Parameters

x

X coordinate.

y

Y coordinate.

Remarks

See also E3DViewer::LockRotationInitialPosition and E3DViewer::UpdateRotationPosition.

E3DViewer.LockRotationInitialPosition

Starts a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is pressed.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LockRotationInitialPosition(
 int x,
 int y
 )
```

Parameters

x

X coordinate.

y

Y coordinate.

Remarks

See also E3DViewer::UpdateRotationPosition and E3DViewer::LockRotationFinalPosition.

E3DViewer.LockTranslationFinalPosition

Finalizes a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is released.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LockTranslationFinalPosition(
 int x,
 int y
 )
```

Parameters

x

X coordinate.

y

Y coordinate.

Remarks

See also E3DViewer::LockTranslationInitialPosition and E3DViewer::UpdateTranslationPosition.

E3DViewer.LockTranslationInitialPosition

Starts a translation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is pressed.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void LockTranslationInitialPosition(
 int x,
 int y
 )
```

Parameters

x

X coordinate.

y

Y coordinate.

Remarks

See also E3DViewer::UpdateTranslationPosition and E3DViewer::LockTranslationFinalPosition.

E3DViewer.NumRenderSources

Returns the number of render sources.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumRenderSources
  { get; }
```

Remarks

See also E3DViewer::GetRenderSourceName.

E3DViewer.Pick3DPoint

Returns and displays the picked E3DPoint in the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint Pick3DPoint(
 int x,
 int y
 )
```

Parameters

x

The X pixel coordinate in the 3DViewer windows

y

The Y pixel coordinate in the 3DViewer windows

Remarks

If there is no point close enough to the picking ray, an EException is thrown (see also E3DViewer::PickingDistanceThreshold). If a callback function is configured (see E3DViewer::SetPickedPointCallBack), then no EException is thrown when there is no point found.

E3DViewer.PickingDisplay

Enables or disables the display of the picked point.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool PickingDisplay
  { get; set; }
```

Remarks

See also E3DViewer::PickingLabelSize, E3DViewer::PickingLabelFixed and E3DViewer::PickingLabelColor.

E3DViewer.PickingDistanceThreshold

Sets or gets the distance threshold for the picking.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float PickingDistanceThreshold
```

```
{ get; set; }
```

Remarks

See also E3DViewer::Pick3DPoint.

E3DViewer.PickingLabelColor

Sets or gets the color of the picked point label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EC24 PickingLabelColor
{ get; set; }
```

Remarks

See also E3DViewer::PickingDisplay, E3DViewer::PickingLabelFixed and E3DViewer::PickingLabelSize.

E3DViewer.PickingLabelFixed

Sets or gets the state to fix or not the label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool PickingLabelFixed
{ get; set; }
```

Remarks

Default state is false. See also E3DViewer::PickingDisplay, E3DViewer::PickingLabelSize and E3DViewer::PickingLabelColor.

E3DViewer.PickingLabelSize

Sets or gets the size of the picked point label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float PickingLabelSize
{ get; set; }
```

Remarks

Default value for size is 0.05. See also E3DViewer::PickingDisplay, E3DViewer::PickingLabelFixed and E3DViewer::PickingLabelColor.

E3DViewer.PointSize

Displays size of the points, in pixels.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int PointSize
  { get; set; }
```

Remarks

The size of the point (range value is 1 to 5 pixels, and 2 by default).
This value is used only to draw an EPointCloud, not for an EMesh.

E3DViewer.ProjectionType

Sets/Gets the projection type.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EProjectionType ProjectionType
  { get; set; }
```

Remarks

If the projection type is EProjectionType_Perspective, then the field of view can be set with the method E3DViewer::FieldOfView.

E3DViewer.Register3DObjects

Sets the list of E3DObject from which their features can be rendered.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Register3DObjects(
 Euresys.Open_eVision.Easy3D.E3DObject[] objects
 )
```

Parameters

objects

List of E3DObject

Remarks

The features that need to be visualize are set with show methods. The registered features have a default style. Previous set styles is ignored. Remove the currently registered E3DObject.

E3DViewer.RemoveAllRenderSources

Removes all render sources. The E3DViewer display will be empty.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void RemoveAllRenderSources(
 )
```

E3DViewer.RemoveCurrent3DObjects

Removes all E3DObject currently registered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void RemoveCurrent3DObjects(
 )
```

E3DViewer.RemoveRenderSource

Removes the given render source.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void RemoveRenderSource(
 string name
 )
```

Parameters

name

The name of the render source to be changed.

E3DViewer.RemoveTextLabel

Removes a text label.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void RemoveTextLabel(
 int id
 )
```

Parameters

id

The id of the text label.

Remarks

See also E3DViewer::AddTextLabel.

E3DViewer.RenderAxis

Enables or disables the display of the axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool RenderAxis
  { get; set; }
```

Remarks

The default state is true.

E3DViewer.RenderAxisConfiguration

Sets/Gets the axis configuration.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DAxisDisplay RenderAxisConfiguration
  { get; set; }
```

E3DViewer.RenderDecimationLevel

Sets or Gets the point cloud decimation level used during the rendering.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int RenderDecimationLevel
  { get; set; }
```

Remarks

The viewer will only render one point every [Decimation Level] points (1 by default, and need to be > 0).
This decimation depends on the order of the points in the EPointCloud.
Irrespectively from this parameter, the viewer decimates the rendered point clouds if it detects lags in its display.

E3DViewer.RenderGrid

Enables or disables the display of Grid.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool RenderGrid
  { get; set; }
```

Remarks

Display Grid with true (true by default).

E3DViewer.RenderGridStep

Sets/Gets the same grid step for each axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float RenderGridStep
  { get; set; }
```

Remarks

The unit of the grid step value is the same as the one from the EPointCloud. If value is equal to 0, then the step is auto computed and if the value is smaller than 0, then there is no step on the axis.
Default value is the size of each axis divided by ten.
For the Get function, if the step is not the same for each axis, then the mean is returned.

E3DViewer.ResetPicking

Resets the last picked point and disable the coordinate display.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ResetPicking(
 )
```

E3DViewer.ResetView

Resets the view point to a view that frame the object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ResetView(
 Euresys.Open_eVision.Easy3D.EViewDirection viewDirection
 )
```

Parameters

viewDirection

The view direction from EViewDirection (optional)

Remarks

The default view direction is from positive Z.

E3DViewer.Resize

Update the size of the 3D viewer window.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Resize(
 int width,
 int height
 )
```

Parameters

width

Width of the viewer window.

height

Height of the viewer window.

E3DViewer.SetAutoRotate

Enables and configures the auto rotate display.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetAutoRotate(
 float vx,
 float vy,
 float vz
 )
```

Parameters

vx
Rotation speed around axis X.

vy
Rotation speed around axis Y.

vz
Rotation speed around axis Z.

E3DViewer.SetColorRampLocation

Sets the location of the color ramp.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetColorRampLocation(
 float xmin,
 float xmax,
 float ymin,
 float ymax
 )
```

Parameters

xmin
The left most coordinate of the color ramp.

xmax
The right most coordinate of the color ramp.

ymin
The bottom most coordinate of the color ramp.

ymax
The top most coordinate of the color ramp.

Remarks

By default, the color ramp is located at the right of the window. The color ramp is always vertical. The value should be between 0 (left/bottom) and 100 (right/top) and corresponds to the % of the window.

E3DViewer.SetFeatureStyleFor3DObject

Sets how the E3DObjectFeature of the registered E3DObject at the specified location idx should be rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFeatureStyleFor3DObject(
 int idx,
 Euresys.Open_eVision.Easy3D.ERenderStyle style,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

idx
-

style
the style

feature
the feature

E3DViewer.SetFeatureStyleForAll3DObjects

Sets how the E3DObjectFeature of all the registered E3DObject should be rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFeatureStyleForAll3DObjects(
 Euresys.Open_eVision.Easy3D.ERenderStyle style,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

style
the style

feature
the feature

E3DViewer.SetFixColorRampBounds

Sets the bounds of the color ramp.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFixColorRampBounds(
 float min,
 float max
 )
```

Parameters

min

The lowest value of the color ramp.

max

The highest value of the color ramp.

Remarks

This function also sets to false E3DViewer::EnableSmartColorRamp. See also E3DViewer::DisableFixColorRampBounds

E3DViewer.SetFocus

The viewer window takes the focus.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFocus(
 )
```

E3DViewer.SetPickedPointCallBack

Sets a callback function that will be called when a new E3DPoint is picked.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetPickedPointCallBack(
 IntPtr pickedPointCallBack,
 IntPtr context,
 bool callCallBackWhenPointNotFound
 )
```

Parameters

pickedPointCallBack

A pointer to a function that will be called when a new E3DPoint is picked.

context

Some context information that will be given in argument to the callback pickedPointCallBack function.

callCallBackWhenPointNotFound

Set to true to call the callback function even if there is not point picked. Default: false.

Remarks

The function pointer should be of type: `delegate void CallBackDelegate(IntPtr context, bool pickedPointFound, float pX, float pY, float pZ, int x, int y).`
To obtain an IntPtr of the function, use:

```
using System.Runtime.InteropServices;,
delegate void CallBackDelegate(IntPtr context, bool pointFound, float pX, float pY,
float pZ, int x, int y);
void MyCallBackFunction(IntPtr context, bool pointFound, float pX, float pY, float pZ,
int x, int y) {...}
Marshal.GetFunctionPointerForDelegate(new CallBackDelegate(MyCallBackFunction)).
```

Where context is the context parameter that was given in argument, pickedPointFound is set to false if a there were no point close enough to the picking ray (true otherwise), pX, pY, pZ are the coordinates of the point that was picked, x and y are the position of the mouse in the window.

E3DViewer.SetPosition

Sets the position of the 3D viewer window.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetPosition(
 int orgX,
 int orgY,
 int width,
 int height,
 IntPtr hWndInsertAfter
 )
```

Parameters

orgX

X coordinate of the top left corner of the viewer window.

orgY

Y coordinate of the top left corner of the viewer window.

width

Width of the viewer window.

height

Height of the viewer window.

hWndInsertAfter

A handle to the window to precede the positioned window in the Z order. Only useful with Win32. see https://docs.microsoft.com/en-us/windows/win32/api/winuser/nf-winuser-setwindowpos

E3DViewer.SetRenderSource

Changes the content of a render source with a new point cloud, mesh or ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.EPointCloud source
 )

void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.EMesh source
 )

void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.EZMap source
 )

void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DSphere sphere,
 Euresys.Open_eVision.EC24 color,
 byte opacity
 )

void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DBox box,
 Euresys.Open_eVision.EC24 color,
 byte opacity
 )
```

```
void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DLine line,
 Euresys.Open_eVision.EC24 color
 )
void SetRenderSource(
 string name,
 Euresys.Open_eVision.Easy3D.E3DPlane plane,
 Euresys.Open_eVision.EC24 color,
 byte opacity
 )
```

Parameters

name
The name of the render source to be changed.

source
An EPointCloud, an EMesh or an EZMap to replace the existing render source.

sphere
An E3DSphere to replace the existing render source.

color
The color of the E3DSphere, E3DBox, E3DLine or E3DPlane.

opacity
The opacity of the E3DSphere, E3DBox or E3DPlane.

box
An E3DBox to replace the existing render source.

line
An E3DLine to replace the existing render source.

plane
An E3DPlane to replace the existing render source.

E3DViewer.SetRenderSourceColorMode

Sets the Source Color Mode. The Source Color Mode defines how the colors of the point cloud or mesh are chosen. See ESourceColorMode.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetRenderSourceColorMode(
 string name,
 Euresys.Open_eVision.Easy3D.ESourceColorMode colorMode
 )
```

Parameters

name

The name of the render source to be considered.

colorMode

The source color mode.

Remarks

See also E3DViewer::SetRenderSourceConstantColor and E3DViewer::GenerateColors.

E3DViewer.SetRenderSourceConstantColor

Sets the constant color used to display a point cloud or a mesh, when ESourceColorMode is set to Constant.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetRenderSourceConstantColor(
 string name,
 Euresys.Open_eVision.EC24 color
 )
```

Parameters

name

The name of the render source to be considered.

color

The color.

Remarks

See also E3DViewer::SetRenderSourceColorMode.

E3DViewer.SetRenderSourceOpacity

Sets the opacity used to display the render source. Only compatible with Constant.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetRenderSourceOpacity(
 string name,
 byte opacity
 )
```

Parameters

name

The name of the render source to be considered.

opacity

The opacity between fully transparent (0) and fully opaque (255).

E3DViewer.SetRenderSourcePointSize

Sets the point size used to display the point clouds.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetRenderSourcePointSize(
 string name,
 int size
 )
```

Parameters

name

The name of the render source to be considered.

size

The number of pixels used to render a point.

E3DViewer.SetRenderSourceWireFrame

Sets the wireframe mode used to render a mesh.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetRenderSourceWireFrame(
 string name,
 bool state
 )
```

Parameters

name

The name of the render source to be considered.

state

Enable or disable the wireframe rendering mode.

E3DViewer.SetRenderSourceWireFrameColor

Sets the wireframe color.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetRenderSourceWireFrameColor(
 string name,
 Euresys.Open_eVision.EC24 color
 )
```

Parameters

name

The name of the render source to be considered.

color

-

E3DViewer.SetRotationMatrix

Sets the view rotation matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetRotationMatrix(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

A matrix representing the view orientation.

E3DViewer.SetViewAngle

Sets view angles.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetViewAngle(
 float angleX,
 float angleY,
 float angleZ
 )
```

Parameters

angleX
Rotation around the X axis.
angleY
Rotation around the Y axis.
angleZ
Rotation around the Z axis. Default: 0

E3DViewer.SetViewTarget

Sets view target position (by default, the camera position is 'look at center of the point cloud').

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetViewTarget(
 float targetX,
 float targetY,
 float targetZ
 )
```

Parameters

targetX
X axis target position.
targetY
Y axis target position.
targetZ
Z axis target position.

E3DViewer.Show

Shows the viewer window, refresh the display.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Show(
 )
```

E3DViewer.ShowColorRampLegend

Enables the display of a color ramp legend.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ShowColorRampLegend(
 )
```

Remarks

See also E3DViewer::HideColorRampLegend, E3DViewer, E3DViewer::ColorRampGraduationColor.

E3DViewer.ShowFeatureFor3DObject

Sets the E3DObjectFeature of the registered E3DObject at the specified location idx to be rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ShowFeatureFor3DObject(
 int idx,
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

idx

the position in the list of registered E3DObject

feature

the feature

E3DViewer.ShowFeatureForAll3DObjects

Sets the E3DObjectFeature of all the registered E3DObject to be rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ShowFeatureForAll3DObjects(
 Euresys.Open_eVision.Easy3D.E3DObjectFeature feature
 )
```

Parameters

feature

the feature

E3DViewer.ShowRenderSource

Shows the given render source.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ShowRenderSource(
 string name
 )
```

Parameters

name

The name of the render source.

Remarks

See also E3DViewer::HideRenderSource.

E3DViewer.StopAutoRotate

Stops the display automatic rotation

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void StopAutoRotate(
 )
```

E3DViewer.ToggleRenderAxis

Toggles the display of the axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ToggleRenderAxis(
 )
```

E3DViewer.ToggleWireframeMode

Toggles the display of wireframe triangles.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ToggleWireframeMode(
 )
```

E3DViewer.UpdateRotationPosition

Updates a rotation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when the mouse moves.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UpdateRotationPosition(
 int x,
 int y
 )
```

Parameters

x

X coordinate.

y

Y coordinate.

Remarks

See also E3DViewer::LockRotationInitialPosition and E3DViewer::LockRotationFinalPosition.

E3DViewer.UpdateTranslationPosition

Updates a translation transformation of the view point using the (x,y) coordinate. Usually (x,y) is the mouse cursor coordinate when a button is pressed.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UpdateTranslationPosition(
 int x,
 int y
 )
```

Parameters

x

X coordinate.

y

Y coordinate.

Remarks

See also E3DViewer::LockTranslationInitialPosition and E3DViewer::LockTranslationFinalPosition.

E3DViewer.UpdateViewDistance

Applies a delta factor to the view distance. Usually this control is mapped on the mouse wheel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UpdateViewDistance(
 float delta
 )
```

Parameters

delta

The factor to change the view distance: move the view point closer to the object when delta is lower than 1 and further to the object when delta is larger than 1.

E3DViewer.ViewDistance

Sets/Gets view distance.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float ViewDistance
  { get; set; }
```

Remarks

Distance between the point of the view and the object.

E3DViewer.WireframeMode

Enables or disables the display of wireframe triangles.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool WireframeMode
  { get; set; }
```

Remarks

Display wireframe triangles with true (false by default).

4.19. EAffineTransformer Class

Manages a 3D coordinates transformation context.

Remarks

By default, no transformation is done (identity matrix). The transformations are applied in the order in which the calls to AddTransform are done.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Transform	Sets the E3DTransformMatrix that will be used.

Methods

AddAnisotropicScalingTransform	Adds anisotropic scaling to the current E3DTransformMatrix.
AddIsotropicScalingTransform	Adds isotropic scaling to the current E3DTransformMatrix.
AddOrthographicProjectionTransform	Adds an orthographic projection to the current E3DTransformMatrix.
AddPerspectiveProjectionTransform	Adds a perspective projection to the current E3DTransformMatrix.
AddRotationXTransform	Adds rotation around the X axis to the current E3DTransformMatrix.
AddRotationYTransform	Adds rotation around the Y axis to the current E3DTransformMatrix.
AddRotationZTransform	Adds rotation around the Z axis to the current E3DTransformMatrix.
AddTransform	Composes a custom transformation with the current E3DTransformMatrix.
AddTranslationTransform	Adds translation to the current E3DTransformMatrix.
ApplyMatrix	Applies a E3DTransformMatrix to a EPointCloud or a points list. If the second parameter is present, puts the transformed points in another point cloud or points list. With a single parameter, the transformation is performed in place.
ApplyTransform	Applies the current transformation to a EPointCloud or a points list. If the second parameter is present, puts the transformed points in another point cloud or points list. With a single parameter, transformation is performed in place.
CreateAnisotropicScalingMatrix	Creates an anisotropic scaling E3DTransformMatrix.

CreateIdentityMatrix	Creates an identity (neutral) E3DTransformMatrix.
CreateIsotropicScaling Matrix	Creates an isotropic scaling E3DTransformMatrix.
CreateOrthographicPro jectionMatrix	Creates an orthographic projection E3DTransformMatrix.
CreatePerspectiveProje ctionMatrix	Creates a perspective projection E3DTransformMatrix.
CreateRotationXMatrix	Creates a rotation E3DTransformMatrix around the X axis.
CreateRotationYMatrix	Creates a rotation E3DTransformMatrix around the Y axis.
CreateRotationZMatrix	Creates a rotation E3DTransformMatrix around the Z axis.
CreateTranslationMatri x	Creates a translation E3DTransformMatrix.
EAffineTransformer	Creates an EAffineTransformer object.
operator=	Assignment operator.
Reset	Resets the transformation E3DTransformMatrix to the identity.

EAffineTransformer.AddAnisotropicScalingTransform

Adds anisotropic scaling to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddAnisotropicScalingTransform(
 float scaleX,
 float scaleY,
 float scaleZ
 )
```

Parameters

scaleX
Scaling factor along the X axis.

scaleY
Scaling factor along the Y axis.

scaleZ
Scaling factor along the Z axis.

EAffineTransformer.AddIsotropicScalingTransform

Adds isotropic scaling to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddIsotropicScalingTransform(
 float scale
 )
```

Parameters

scale

Scaling factor.

EAffineTransformer.AddOrthographicProjectionTransform

Adds an orthographic projection to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddOrthographicProjectionTransform(
 float width,
 float height
 )
```

Parameters

width

Width of the viewport.

height

Height of the viewport.

EAffineTransformer.AddPerspectiveProjectionTransform

Adds a perspective projection to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddPerspectiveProjectionTransform(
 float distance,
 float width,
 float height
 )
```

Parameters

distance
Distance of the viewport to the origin.
width
Width of the viewport.
height
Height of the viewport.

EAffineTransformer.AddRotationXTransform

Adds rotation around the X axis to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddRotationXTransform(
 float Angle
 )
```

Parameters

Angle
Rotation angle.

EAffineTransformer.AddRotationYTransform

Adds rotation around the Y axis to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddRotationYTransform(
 float Angle
 )
```

Parameters

Angle
Rotation angle.

EAffineTransformer.AddRotationZTransform

Adds rotation around the Z axis to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddRotationZTransform(
 float Angle
 )
```

Parameters

Angle

Rotation angle.

EAffineTransformer.AddTransform

Composes a custom transformation with the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddTransform(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix
 )
```

Parameters

matrix

Transformation matrix.

EAffineTransformer.AddTranslationTransform

Adds translation to the current E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix AddTranslationTransform(
 float dX,
 float dY,
 float dZ
 )
```

Parameters

dX

Translation along the X axis.

dY

Translation along the Y axis.

dZ

Translation along the Z axis.

EAffineTransformer.ApplyMatrix

Applies a E3DTransformMatrix to a EPointCloud or a points list.
If the second parameter is present, puts the transformed points in another point cloud or points list.
With a single parameter, the transformation is performed in place.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ApplyMatrix(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix,
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EPointCloud transformedCloud
 )
void ApplyMatrix(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix,
 Euresys.Open_eVision.Easy3D.EPointCloud cloud
 )
void ApplyMatrix(
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix matrix,
 Euresys.Open_eVision.Easy3D.E3DPoint[] sourcePoints,
 out Euresys.Open_eVision.Easy3D.E3DPoint[] transformedPoints
 )
```

Parameters

matrix
Transformation matrix.

cloud
Cloud to transform.

transformedCloud
Transformed cloud.

sourcePoints
Points list to transform.

transformedPoints
Transformed points list.

EAffineTransformer.ApplyTransform

Applies the current transformation to a EPointCloud or a points list.
If the second parameter is present, puts the transformed points in another point cloud or points list.
With a single parameter, transformation is performed in place.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ApplyTransform(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EPointCloud transformedCloud
 )
void ApplyTransform(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud
 )
void ApplyTransform(
 Euresys.Open_eVision.Easy3D.E3DPoint[] sourcePoints,
 out Euresys.Open_eVision.Easy3D.E3DPoint[] transformedPoints
 )
```

Parameters

cloud
Cloud to transform.

transformedCloud
Transformed cloud.

sourcePoints
Points list to transform.

transformedPoints
Transformed points list.

EAffineTransformer.CreateAnisotropicScalingMatrix

Creates an anisotropic scaling E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateAnisotropicScalingMatrix(
 float scaleX,
 float scaleY,
 float scaleZ
 )
```

Parameters

scaleX
Scaling factor along the X axis.

scaleY
Scaling factor along the Y axis.

scaleZ
Scaling factor along the Z axis.

EAffineTransformer.CreateIdentityMatrix

Creates an identity (neutral) E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateIdentityMatrix(
 )
```

EAffineTransformer.CreateIsotropicScalingMatrix

Creates an isotropic scaling E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateIsotropicScalingMatrix(
 float scale
 )
```

Parameters

scale

Scaling factor.

EAffineTransformer.CreateOrthographicProjectionMatrix

Creates an orthographic projection E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateOrthographicProjectionMatrix(
 float width,
 float height
 )
```

Parameters

width

Width of the viewport.

height

Height of the viewport.

EAffineTransformer.CreatePerspectiveProjectionMatrix

Creates a perspective projection E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreatePerspectiveProjectionMatrix(
 float distance,
 float width,
 float height
 )
```

Parameters

distance
Distance of the viewport to the origin.

width
Width of the viewport.

height
Height of the viewport.

EAffineTransformer.CreateRotationXMatrix

Creates a rotation E3DTransformMatrix around the X axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationXMatrix(
 float Angle
 )
```

Parameters

Angle
Rotation angle.

EAffineTransformer.CreateRotationYMatrix

Creates a rotation E3DTransformMatrix around the Y axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationYMatrix(
 float Angle
 )
```

Parameters

Angle

Rotation angle.

EAffineTransformer.CreateRotationZMatrix

Creates a rotation E3DTransformMatrix around the Z axis.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateRotationZMatrix(
 float Angle
 )
```

Parameters

Angle

Rotation angle.

EAffineTransformer.CreateTranslationMatrix

Creates a translation E3DTransformMatrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix CreateTranslationMatrix(
 float dX,
 float dY,
 float dZ
 )
```

Parameters

dX

Translation along the X axis.

dY

Translation along the Y axis.

dZ

Translation along the Z axis.

EAffineTransformer.EAffineTransformer

Creates an EAffineTransformer object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EAffineTransformer(
 )
void EAffineTransformer(
 Euresys.Open_eVision.Easy3D.EAffineTransformer other
 )
```

Parameters

other

Another EAffineTransformer.

EAffineTransformer.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EAffineTransformer operator=(
 Euresys.Open_eVision.Easy3D.EAffineTransformer other
 )
```

Parameters

other

Another EAffineTransformer.

EAffineTransformer.Reset

Resets the transformation E3DTransformMatrix to the identity.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Reset(
 )
```

EAffineTransformer.Transform

Sets the E3DTransformMatrix that will be used.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Transform
```

```
{ get; set; }
```

4.20. EAngleRectifier Class

-

Namespace: Euresys.Open_eVision

Methods

Rectify	-

EAngleRectifier.Rectify

-

Namespace: Euresys.Open_eVision

```
[C#]
double Rectify(
 double angle,
 double mean
 )
double Rectify(
 double angle,
 double mean,
 Euresys.Open_eVision.EAngleUnit currentUnit
 )
```

Parameters

angle

-

mean

-

currentUnit

-

4.21. Easy Class

This class contains static properties and methods specific to the Easy library.

Namespace: Euresys.Open_eVision

Properties

AngleUnit	Current angular unit.
EnableEnhancedImageDisplay	The enhanced mode for displaying the images.
MaxNumberOfProcessingThreads	Maximum number of threads used internally by the Open eVision tools (default value: 1). This number cannot be higher than the number of processor cores available to the system. See Easy::NumberOfAvailableProcessorCores. This value is thread local. It means that this value can be controlled independently for each thread you create.
NumberOfAvailableProcessorCores	Number of processor cores available to the system. This is the upper limit for the number of threads usable internally by the Open eVision tools. See Easy::MaxNumberOfProcessingThreads
NumGPUs	Number of GPUs available to the system.
ResourcesRootPath	Retrieves the resources installation path.
SampleImagesRootPath	Retrieves the sample images installation path.
SampleProgramsRootPath	Retrieves the sample programs installation path.
Version	Returns a pointer to a NULL terminated character string that contains the current version number of Open eVision.

Methods

CheckLicense	Checks if a given license is available.
CheckLicenses	Check if at least one license is available. Otherwise, an exception is thrown.
CheckOemKey	Checks if the OEM key, if any, matches a given argument.
CloseImageGraphicContext	Releases the device context associated to an image. Deprecated: use EWindowsDrawAdapter class by passing an image to its constructor instead.
FromDegrees	Returns the angle, converted from degrees to the current angle unit.
FromRadians	Returns the angle, converted from radians to the current angle unit.
GetBestMatchingImageType	Returns the best matching image type for a given file on disk.
GetDongleCount	Get the number of available dongle on the system.
GetDongleInternalSerialNumber	Get the serial number of the selected dongle.
GetErrorText	Returns the description associated to a given error code.
GetGPUComputeCapability	CUDA compute capability for the specified GPU.

GetGPUName	Name of the GPU.
Initialize	Initializes Open eVision.
IsGPUAvailable	Indicates if a supported GPU is available for Open eVision computation.
LogInMemento	Logs a message in eGrabber Memento
OpenImageGraphicContext	Allows to draw in a gray-level or a color image, using any of the Windows device context functions (the image contents is altered, allowing destructive overlays). Deprecated: use EWindowsDrawAdapter class by passing an image to its constructor instead.
Render3D	Prepares a three dimensional rendering of an image where the gray-level values are taken for altitudes.
RenderColorHistogram	Prepares a three dimensional rendering of the histogram of a color image: the pixels are drawn in the RGB space rather than in the XY plane.
Resize	Resizes an image without interpolation.
SetOemKey	Writes an OEM key value on a dongle.
StartTiming	Starts timing, using the system clock or performance counter.
StopTiming	Returns the time, in specified time units, elapsed since the last invocation of Easy::StartTiming.
Terminate	Method not obligatory, but necessary for close dll cleanly.
ToDegrees	Returns the angle, converted from current angle unit to degrees.
ToRadians	Returns the angle, converted from current angle unit to radians.
TrueTimingResolution	Returns the actual resolution of the timing clock, in ticks per seconds.

Easy.AngleUnit

Current angular unit.

Namespace: Euresys.Open_eVision

```
[C#]
static Euresys.Open_eVision.EAngleUnit AngleUnit
  { get; set; }
```

Remarks

All angles are computed using some angular unit, as well on input as on output. The desired unit can be changed at any time. By default, all angles are given in degrees (0..360).

Easy.CheckLicense

Checks if a given license is available.

Namespace: Euresys.Open_eVision

```
[C#]
bool CheckLicense(
 Euresys.Open_eVision.LicenseFeatures.Features license
 )
```

Parameters

license

The license to check

Easy.CheckLicenses

Check if at least one license is available. Otherwise, an exception is thrown.

Namespace: Euresys.Open_eVision

```
[C#]
void CheckLicenses(
 )
```

Easy.CheckOemKey

Checks if the OEM key, if any, matches a given argument.

Namespace: Euresys.Open_eVision

```
[C#]
bool CheckOemKey(
 char[] key,
 Euresys.Open_eVision.EDongleType type,
 int dongleIndex
 )

bool CheckOemKey(
 uint keyIndex,
 char[] key,
 Euresys.Open_eVision.EDongleType type,
 int dongleIndex
 )
```

Parameters

key

The expected value of the OEM key

type

The EDongleType for which you want to check the OEM key.

dongleIndex

The index of the dongle where the OEM key is expected. By default, the first dongle found is selected.

keyIndex

The index of the key in the array of keys, must be in [0, 11].
This option is not compatible with Legacy

Remarks

The length of the OEM key must be in [8, 64] characters.

Easy.CloseImageGraphicContext

This method is deprecated.

Releases the device context associated to an image. Deprecated: use EWindowsDrawAdapter class by passing an image to its constructor instead.

Namespace: Euresys.Open_eVision

```
[C#]
void CloseImageGraphicContext(
 Euresys.Open_eVision.EImageBW8 pImage,
 IntPtr hDC
 )
void CloseImageGraphicContext(
 Euresys.Open_eVision.EImageC24 pImage,
 IntPtr hDC
 )
```

Parameters

pImage

Pointer to the target image (must be the same as that passed to Easy::OpenImageGraphicContext).

hDC

Handle to a device context that was produced by Easy::OpenImageGraphicContext.

Easy.EnableEnhancedImageDisplay

The enhanced mode for displaying the images.

Namespace: Euresys.Open_eVision

[C#]

```
static bool EnableEnhancedImageDisplay
  { get; set; }
```

Remarks

When enabled, enhanced mode performs advanced interpolation for image display. By default, enhanced mode is disabled.
Enhanced mode has a significant impact on drawing performances. Enhanced display mode is set for the current thread.

Easy.FromDegrees

Returns the angle, converted from degrees to the current angle unit.

Namespace: Euresys.Open_eVision

[C#]

```
float FromDegrees(
 float angle
 )
```

Parameters

angle

Angle to be converted

Easy.FromRadians

Returns the angle, converted from radians to the current angle unit.

Namespace: Euresys.Open_eVision

[C#]

```
float FromRadians(
 float angle
 )
```

Parameters

angle

Angle to be converted

Easy.GetBestMatchingImageType

Returns the best matching image type for a given file on disk.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageType GetBestMatchingImageType(
 string path
 )
```

Parameters

path

The path to the file on disk.

Easy.GetDongleCount

Get the number of available dongle on the system.

Namespace: Euresys.Open_eVision

[C#]

```
uint GetDongleCount(
 Euresys.Open_eVision.EDongleType type
 )
```

Parameters

type

The EDongleType you want to enumerate.

Easy.GetDongleInternalSerialNumber

Get the serial number of the selected dongle.

Namespace: Euresys.Open_eVision

[C#]

```
string GetDongleInternalSerialNumber(
 Euresys.Open_eVision.EDongleType type,
 int index
 )
```

Parameters

type

The EDongleType.

index

The index of the dongle.

Easy.GetErrorText

Returns the description associated to a given error code.

Namespace: Euresys.Open_eVision

```
[C#]
string GetErrorText(
 Euresys.Open_eVision.EError error
 )
```

Parameters

error

Error code.

Easy.GetGPUComputeCapability

CUDA compute capability for the specified GPU.

Namespace: Euresys.Open_eVision

```
[C#]
string GetGPUComputeCapability(
 int gpuId
 )
```

Parameters

gpuId

Index of the GPU between 0 and Easy::NumGPUs - 1.

Easy.GetGPUName

Name of the GPU.

Namespace: Euresys.Open_eVision

```
[C#]
string GetGPUName(
 int gpuId
 )
```

Parameters

gpuId

Index of the GPU between 0 and Easy::NumGPUs - 1.

Easy.Initialize

Initializes Open eVision.

Namespace: Euresys.Open_eVision

```
[C#]
void Initialize(
 )
```

Easy.IsGPUAvailable

Indicates if a supported GPU is available for Open eVision computation.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsGPUAvailable(
 )
```

Easy.LogInMemento

Logs a message in eGrabber Memento

Namespace: Euresys.Open_eVision

```
[C#]
void LogInMemento(
 string message,
 Euresys.Open_eVision.EVerbosity verbosity,
 byte user
 )
```

Parameters

message

The message to log.

verbosity

The verbosity level of the message.

user

The user index, from 0 to 15

Remarks

The default verbosity level is EVerbosity_Info and the default user ID is 0. For more information about how Memento handles messages, please refer to the Memento documentation.

Easy.MaxNumberOfProcessingThreads

Maximum number of threads used internally by the Open eVision tools (default value: 1). This number cannot be higher than the number of processor cores available to the system. See Easy::NumberOfAvailableProcessorCores. This value is thread local. It means that this value can be controlled independently for each thread you create.

Namespace: Euresys.Open_eVision

[C#]

```
static int MaxNumberOfProcessingThreads
  { get; set; }
```

Easy.NumberOfAvailableProcessorCores

Number of processor cores available to the system. This is the upper limit for the number of threads usable internally by the Open eVision tools. See Easy::MaxNumberOfProcessingThreads

Namespace: Euresys.Open_eVision

[C#]

```
static int NumberOfAvailableProcessorCores
  { get; }
```

Easy.NumGPUs

Number of GPUs available to the system.

Namespace: Euresys.Open_eVision

[C#]

```
static int NumGPUs
  { get; }
```

Easy.OpenImageGraphicContext

This method is deprecated.

Allows to draw in a gray-level or a color image, using any of the Windows device context functions (the image contents is altered, allowing destructive overlays). Deprecated: use EWindowsDrawAdapter class by passing an image to its constructor instead.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr OpenImageGraphicContext(
 Euresys.Open_eVision.EImageBW8 pImage
 )

IntPtr OpenImageGraphicContext(
 Euresys.Open_eVision.EImageC24 pImage
 )
```

Parameters

pImage

Pointer to the target image.

Remarks

The function returns a handle to a device context associated to the image pixel data. When the device context is no more needed, call the Easy::CloseImageGraphicContext function with the same argument.

Easy.Render3D

Prepares a three dimensional rendering of an image where the gray-level values are taken for altitudes.

Namespace: Euresys.Open_eVision

[C#]

```
void Render3D(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 float phi,
 float psi,
 float xScale,
 float yScale,
 float zScale,
 int dotSize
 )

void Render3D(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 zImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float phi,
 float psi,
 float xScale,
 float yScale,
 float zScale,
 int dotSize
 )
```

Parameters

sourceImage
Pointer to the source image.

destinationImage
Pointer to the destination image.

phi
Rotation angle about the X-axis.

psi
Rotation angle about the Y-axis.

xScale
Magnification factor along X (should remain close to 1).

yScale
Magnification factor along Y (should remain close to 1).

zScale
Magnification factor along Z (should remain close to 1).

dotSize
Size of the rendered dots; allowed values are 1, 4, 5 or 9.

zImage
Pointer to the altitude image.

Remarks

The image is viewed by rotating it about the X-axis, then about the Y-axis. Magnification factors in the three directions (X = width, Y = height, and Z = depth) can be given.
The rendered image appears as independent dots. The dot size can be adjusted so that the surface appears more or less opaque.
The function does not display the rendered image by itself. Rather, it prepares a destination image to be displayed.

Easy.RenderColorHistogram

Prepares a three dimensional rendering of the histogram of a color image: the pixels are drawn in the RGB space rather than in the XY plane.

Namespace: Euresys.Open_eVision

[C#]

```
void RenderColorHistogram(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float phi,
 float psi,
 float xScale,
 float yScale,
 float zScale
 )
```

```
void RenderColorHistogram(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 sysImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float phi,
 float psi,
 float xScale,
 float yScale,
 float zScale
 )
```

Parameters

sourceImage

Pointer to the raw source image.

destinationImage

Pointer to the destination image.

phi

Rotation angle about the X-axis.

psi

Rotation angle about the Y-axis.

xScale

Magnification factor along X (should remain close to 1).

yScale

Magnification factor along Y (should remain close to 1).

zScale

Magnification factor along Z (should remain close to 1).

sysImage

Pointer to the source image transformed into another color system.

Remarks

This allows to observe the clustering and dispersion of the RGB values.
The image is viewed by rotating it about the X-axis, then about the Y-axis. Magnification factors in the three directions (X = Red, Y = Green, and Z = Blue) can be given.
In a more advanced version, prepares a three dimensional rendering of the pixels in another system than RGB (EasyColor provides conversion means). However, the raw RGB image must still be provided to allow the display of the pixels in their usual colors.
The rendered image appears as independent dots.
The function does not display the rendered image by itself. Rather, it prepares a destination image to be displayed.

Easy.Resize

Resizes an image without interpolation.

Namespace: Euresys.Open_eVision

[C#]

```
void Resize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void Resize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void Resize(
 Euresys.Open_eVision.EROIC15 sourceImage,
 Euresys.Open_eVision.EROIC15 destinationImage
 )
void Resize(
 Euresys.Open_eVision.EROIC16 sourceImage,
 Euresys.Open_eVision.EROIC16 destinationImage
 )
void Resize(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Resize(
 Euresys.Open_eVision.EROIC24A sourceImage,
 Euresys.Open_eVision.EROIC24A destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

Easy.ResourcesRootPath

Retrieves the resources installation path.

Namespace: Euresys.Open_eVision

[C#]

```
static string ResourcesRootPath
  { get; }
```

Easy.SampleImagesRootPath

Retrieves the sample images installation path.

Namespace: Euresys.Open_eVision

```
[C#]
static string SampleImagesRootPath
  { get; }
```

Easy.SampleProgramsRootPath

Retrieves the sample programs installation path.

Namespace: Euresys.Open_eVision

```
[C#]
static string SampleProgramsRootPath
  { get; }
```

Easy.SetOemKey

Writes an OEM key value on a dongle.

Namespace: Euresys.Open_eVision

```
[C#]
void SetOemKey(
 char[] key,
 Euresys.Open_eVision.EDongleType type,
 int dongleIndex
 )
void SetOemKey(
 uint keyIndex,
 char[] key,
 Euresys.Open_eVision.EDongleType type,
 int dongleIndex
 )
```

Parameters

key

The OEM key value to write

type

The EDongleType for which you want to set the OEM key.

dongleIndex

The index of the dongle where the OEM key must be written. By default, the first dongle found is selected.

keyIndex

The index of the key in the array of keys, must be in [0, 11].
This option is not compatible with Legacy

Remarks

The length of the OEM key must be in [8, 64] characters. This method raises an CannotWriteOEMKey error if the value cannot be set properly.

Easy.StartTiming

Starts timing, using the system clock or performance counter.

Namespace: Euresys.Open_eVision

```
[C#]
void StartTiming(
 )
```

Easy.StopTiming

Returns the time, in specified time units, elapsed since the last invocation of Easy::StartTiming.

Namespace: Euresys.Open_eVision

```
[C#]
int StopTiming(
 int resolution
 )
```

Parameters

resolution

Temporal resolution, in ticks per second.

Easy.Terminate

Method not obligatory, but necessary for close dll cleanly.

Namespace: Euresys.Open_eVision

```
[C#]
void Terminate(
 )
```

Easy.ToDegrees

Returns the angle, converted from current angle unit to degrees.

Namespace: Euresys.Open_eVision

```
[C#]
float ToDegrees(
 float angle
 )
```

Parameters

angle

Angle to be converted.

Easy.ToRadians

Returns the angle, converted from current angle unit to radians.

Namespace: Euresys.Open_eVision

```
[C#]
float ToRadians(
 float angle
 )
```

Parameters

angle

Angle to be converted.

Easy.TrueTimingResolution

Returns the actual resolution of the timing clock, in ticks per seconds.

Namespace: Euresys.Open_eVision

```
[C#]
int TrueTimingResolution(
 )
```

Remarks

Timing granularity is hardware-dependent, but is usually better than 1 microsecond. This function can be used to select an appropriate timing resolution when using Easy::StopTiming.

Easy.Version

Returns a pointer to a NULL terminated character string that contains the current version number of Open eVision.

Namespace: Euresys.Open_eVision

```
[C#]
static string Version
  { get; }
```

4.22. EasyColor Class

This class contains static properties and methods specific to the EasyColor library.

Namespace: Euresys.Open_eVision

Properties

CieAB	CIE AB white illuminant
CieAG	CIE AG white illuminant
CieAR	CIE AR white illuminant
CieD50B	CIE D50B white illuminant
CieD50G	CIE D50G white illuminant
CieD50R	CIE D50R white illuminant
CieD55B	CIE D55B white illuminant
CieD55G	CIE D55G white illuminant
CieD55R	CIE D55R white illuminant
CieD65B	CIE D65B white illuminant
CieD65G	CIE D65G white illuminant
CieD65R	CIE D65R white illuminant
CieFB	CIE FB white illuminant
CieFG	CIE FG white illuminant
CieFR	CIE FR white illuminant
CompensateNtscGamma	NTSC inverse gamma exponent

CompensatePalGamma	PAL inverse gamma exponent
CompensateSmpteGamma	NTSC inverse gamma exponent
DstQuantization	Quantization mode for output values.
NtscGamma	NTSC gamma exponent
PalGamma	PAL gamma exponent
RgbStandard	RGB definition to be used when converting between RGB and other color systems.
SmpteGamma	SMPTE gamma exponent
SrcQuantization	Quantization mode for input values.

Methods

AlphaBlend	Draws an image over an other.
AssignNearestClass	Assigns to every pixel of the source image the nearest class index *plus one* and stores its value in the destination image.
AssignNearestClassCenter	Assigns to every pixel of the source image the nearest class center and stores its value in the destination image.
BayerToC24	Converts a Bayer pattern encoded image into a color image. Prefer the function EasyColor::BayerToC24 with EBayerConfiguration and mode parameters.
C24ToBayer	Converts a color image into a Bayer pattern encoded image. Deprecation notice: the version of this method taking two bool as argument is deprecated. You should use the one taking an EBayerConfiguration instead.
ClassAverages	Computes the average source pixel colors for every class separately.
ClassVariances	Computes the averages and variances of the image pixel colors for every class separately.
Compose	Combines three gray-level images, considered as three color planes, into a color image.
Decompose	Extracts the three color planes, considered as gray-level images, from a color image.
Dequantize	Convert a quantized value to a unquantized value of a given color system.
Format422To444	Converts a YUV 4:2:2 image to a YUV 4:4:4 image using interpolation.
Format444To422	Converts a YUV 4:4:4 image to a YUV 4:2:2 image using filtering
GetComponent	Extracts one color plane, considered as a gray-level image, from a color image.
ImproveClassCenters	Redefines the class centers by computing the average color value of the pixels assigned to each class in the source image.
IshToRgb	Convert a color from any system to RGB.
LabToRgb	Convert a color from any system to RGB.

LabToXyz	Convert a color from one system to another.
LchToRgb	Convert a color from any system to RGB.
LshToRgb	Convert a color from any system to RGB.
LuvToRgb	Convert a color from any system to RGB.
LuvToXyz	Convert a color from one system to another.
PseudoColor	Applies the mapping defined by the pseudo-color lookup table to transform a gray-level image into a color image.
Quantize	Convert an unquantized color of a given color system to a quantized color.
RegisterPlanes	Sets a color plane of a color image by using a gray-level image as component.
RgbToIsh	Convert a color from RGB to another system.
RgbToLab	Convert a color from RGB to another system.
RgbToLch	Convert a color from RGB to another system.
RgbToLsh	Convert a color from RGB to another system.
RgbToLuv	Convert a color from RGB to another system.
RgbToReducedXyz	Convert a color from one system to another.
RgbToVsh	Convert a color from RGB to another system.
RgbToXyz	Convert a color from RGB to another system.
RgbToYiq	Convert a color from RGB to another system.
RgbToYsh	Convert a color from RGB to another system.
RgbToYuv	Convert a color from RGB to another system.
SetComponent	Sets a color plane of a color image by using a gray-level image as component.
Transform	Applies a color transformation to a specified image.
TransformBayer	Converts an image, using the transformation defined by a color lookup. Deprecation notice: the version of this method taking two bool as argument is deprecated. You should use the one taking an EBayerConfiguration instead.
VshToRgb	Convert a color from any system to RGB.
XyzToLab	Convert a color from one system to another.
XyzToLuv	Convert a color from one system to another.
XyzToRgb	Convert a color from any system to RGB.
YiqToRgb	Convert a color from any system to RGB.
YshToRgb	Convert a color from any system to RGB.
YuvToRgb	Convert a color from any system to RGB.

EasyColor.AlphaBlend

Draws an image over an other.

Namespace: Euresys.Open_eVision

```
[C#]
void AlphaBlend(
 Euresys.Open_eVision.EROIC24 source,
 Euresys.Open_eVision.EROIC24 destination,
 double opacity
 )
```

Parameters

source

Foreground image.

destination

Background image.

opacity

Opacity of the foreground image.

EasyColor.AssignNearestClass

Assigns to every pixel of the source image the nearest class index *plus one* and stores its value in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void AssignNearestClass(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24Vector classCenters
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination gray-level image/ROI.

classCenters

Pointer to the vector of the class centers.

Remarks

This generates a labeled gray-level image for use with EasyObject (see EImageEncoder and ELabeledImageSegmenter).

Note. The class index plus one is stored instead of the class index because EasyObject will never code class 0 objects.
Color image segmentation allows you to decompose a color image in different regions by assigning a "class" (integer index) to every pixel. The nearest neighbor method is used, i.e. for each class a representative center is specified, and a given pixel is associated to the class with the closest center.
Color image segmentation can be used in conjunction with EasyObject to perform blob analysis on the segmented regions.
To use the color segmentation functions, the set of class centers must be specified as a vector of EC24 elements. In this sense, the method is termed supervised clustering. A good way to obtain these values is to compute the average color in an ROI.
Unsupervised clustering is also made available by implementing the so called K-means method that automatically improves an initial choice of class centers.

EasyColor.AssignNearestClassCenter

Assigns to every pixel of the source image the nearest class center and stores its value in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void AssignNearestClassCenter(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EC24Vector classCenters
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

classCenters

Pointer to the vector of the class centers.

Remarks

This generates a labeled color image.
Color image segmentation allows you to decompose a color image in different regions by assigning a "class" (integer index) to every pixel. The nearest neighbor method is used, i.e. for each class a representative center is specified, and a given pixel is associated to the class with the closest center.
Color image segmentation can be used in conjunction with EasyObject to perform blob analysis on the segmented regions.
To use the color segmentation functions, the set of class centers must be specified as a vector of EC24 elements. In this sense, the method is termed supervised clustering. A good way to obtain these values is to compute the average color in an ROI.
Unsupervised clustering is also made available by implementing the so called K-means method that automatically improves an initial choice of class centers.

EasyColor.BayerToC24

Converts a Bayer pattern encoded image into a color image.
Prefer the function EasyColor::BayerToC24 with EBayerConfiguration and mode parameters.

Namespace: Euresys.Open_eVision

[C#]

```
void BayerToC24(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool evenCol,
 bool evenRow,
 bool interpolate,
 bool improved
 )

void BayerToC24(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EBayerConfiguration bayerConfiguration,
 int mode
 )
```

Parameters

sourceImage

Pointer to the Bayer pattern input image/ROI, stored using the 8 bits per pixel format.

destinationImage

Pointer to the color output image/ROI.

evenCol

true if the leftmost image column contains no blue pixels.

evenRow

true if the topmost image row contains no red pixels.

interpolate

Interpolation mode to be used for pixel reconstruction. When false, the missing color components are merely copied from northern/western pixels; when true, they are computed by averaging from relevant neighbors. By default, interpolation is used.

improved

Provides an access to an improved interpolation mode that reduces visible artifacts along object edges. The running time of the improved method is longer. By default, it is not used.

bayerConfiguration

The color configuration of the bayer image. The color configuration is defined by the component of the first 2 pixels of the image, see EBayerConfiguration.

mode

Interpolation mode to be used for RGB pixel reconstruction, from 0 to 4 (increasing quality). By default, interpolation mode 1 is used.
- mode 0: No interpolation (fastest)
- mode 1: Linear interpolation on 3x3 kernel
- mode 2: Advanced interpolation on 3x3 kernel
- mode 3: Interpolation on 5x5 kernel
- mode 4: Interpolation on 9x9 kernel (slowest)
- mode 5: Linear interpolation on 2x2 kernel

Remarks

The pattern can be shifted by one pixel horizontally and vertically as needed to deal with a non standard pattern origin.
See also Bayer Filter.

EasyColor.C24ToBayer

Converts a color image into a Bayer pattern encoded image. Deprecation notice: the version of this method taking two bool as argument is deprecated. You should use the one taking an EBayerConfiguration instead.

Namespace: Euresys.Open_eVision

[C#]

```
void C24ToBayer(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBayerConfiguration bayerConfiguration
 )
```

```
void C24ToBayer(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool evenCol,
 bool evenRow
 )
```

Parameters

sourceImage

Pointer to the color input image/ROI.

destinationImage

Pointer to the Bayer pattern output image/ROI, stored using the 8 bits per pixel format.

bayerConfiguration

The color configuration of the bayer image. The color configuration is defined by the component of the first 2 pixels of the image, see EBayerConfiguration.

evenCol

true if the leftmost destination image column can't contain blue pixels.

evenRow

true if the topmost destination image row can't contain red pixels.

Remarks

The pattern can be shifted by one pixel horizontally and vertically as needed to deal with a non standard pattern origin.
See also Bayer Filter.

EasyColor.CieAB

CIE AB white illuminant

Namespace: Euresys.Open_eVision

[C#]

```
static float CieAB
  { get; }
```

EasyColor.CieAG

CIE AG white illuminant

Namespace: Euresys.Open_eVision

[C#]

```
static float CieAG
  { get; }
```

EasyColor.CieAR

CIE AR white illuminant

Namespace: Euresys.Open_eVision

[C#]

```
static float CieAR
  { get; }
```

EasyColor.CieD50B

CIE D50B white illuminant

Namespace: Euresys.Open_eVision

[C#]

```
static float CieD50B
  { get; }
```

EasyColor.CieD50G

CIE D50G white illuminant

Namespace: Euresys.Open_eVision

[C#]

```
static float CieD50G
  { get; }
```

EasyColor.CieD50R

CIE D50R white illuminant

Namespace: Euresys.Open_eVision

[C#]

```
static float CieD50R
  { get; }
```

EasyColor.CieD55B

CIE D55B white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieD55B
  { get; }
```

EasyColor.CieD55G

CIE D55G white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieD55G
  { get; }
```

EasyColor.CieD55R

CIE D55R white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieD55R
  { get; }
```

EasyColor.CieD65B

CIE D65B white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieD65B
  { get; }
```

EasyColor.CieD65G

CIE D65G white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieD65G
  { get; }
```

EasyColor.CieD65R

CIE D65R white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieD65R
  { get; }
```

EasyColor.CieFB

CIE FB white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieFB
  { get; }
```

EasyColor.CieFG

CIE FG white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieFG
  { get; }
```

EasyColor.CieFR

CIE FR white illuminant

Namespace: Euresys.Open_eVision

```
[C#]
static float CieFR
```

```
{ get; }
```

EasyColor.ClassAverages

Computes the average source pixel colors for every class separately.

Namespace: Euresys.Open_eVision

```
[C#]
void ClassAverages(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector classCenters,
 Euresys.Open_eVision.EColorVector averages
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

classCenters

Pointer to the vector of the class centers.

averages

Pointer to the vector of the average color values.

Remarks

This allows measuring the actual average color of the segmented regions.
Color image segmentation allows you to decompose a color image in different regions by assigning a "class" (integer index) to every pixel. The nearest neighbor method is used, i.e. for each class a representative center is specified, and a given pixel is associated to the class with the closest center.
Color image segmentation can be used in conjunction with EasyObject to perform blob analysis on the segmented regions.
To the color segmentation functions, the set of class centers must be specified as a vector of EC24 elements. In this sense, the method is termed supervised clustering. A good way to obtain these values is to compute the average color in an ROI.
Unsupervised clustering is also made available by implementing the so called K-means method that automatically improves an initial choice of class centers.

EasyColor.ClassVariances

Computes the averages and variances of the image pixel colors for every class separately.

Namespace: Euresys.Open_eVision

[C#]

```
void ClassVariances(
 Euresys.Open_eVision.ERGBIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector classCenters,
 Euresys.Open_eVision.EColorVector averages,
 Euresys.Open_eVision.EColorVector variances
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

classCenters

Pointer to the vector of the class centers.

averages

Pointer to the vector of the average color values.

variances

Pointer to the vector of the variance color values.

Remarks

This allows quantifying the homogeneity of the segmented regions.
Color image segmentation allows you to decompose a color image in different regions by assigning a "class" (integer index) to every pixel. The nearest neighbor method is used, i.e. for each class a representative center is specified, and a given pixel is associated to the class with the closest center. Color image segmentation can be used in conjunction with EasyObject to perform blob analysis on the segmented regions.
To the color segmentation functions, the set of class centers must be specified as a vector of EC24 elements. In this sense, the method is termed supervised clustering. A good way to obtain these values is to compute the average color in an ROI.
Unsupervised clustering is also made available by implementing the so called K-means method that automatically improves an initial choice of class centers.

EasyColor.CompensateNtscGamma

NTSC inverse gamma exponent

Namespace: Euresys.Open_eVision

[C#]

```
static float CompensateNtscGamma
  { get; }
```

EasyColor.CompensatePalGamma

PAL inverse gamma exponent

Namespace: Euresys.Open_eVision

[C#]

```
static float CompensatePalGamma
  { get; }
```

EasyColor.CompensateSmpteGamma

NTSC inverse gamma exponent

Namespace: Euresys.Open_eVision

[C#]

```
static float CompensateSmpteGamma
  { get; }
```

EasyColor.Compose

Combines three gray-level images, considered as three color planes, into a color image.

Namespace: Euresys.Open_eVision

[C#]

```
void Compose(
 Euresys.Open_eVision.EROIBW8 sourceImageOfColor0,
 Euresys.Open_eVision.EROIBW8 sourceImageOfColor1,
 Euresys.Open_eVision.EROIBW8 sourceImageOfColor2,
 Euresys.Open_eVision.EROIC24 colorDestinationImage,
 Euresys.Open_eVision.EColorLookup lookup
 )
void Compose(
 Euresys.Open_eVision.EROIBW16 sourceImageOfColor0,
 Euresys.Open_eVision.EROIBW16 sourceImageOfColor1,
 Euresys.Open_eVision.EROIBW16 sourceImageOfColor2,
 Euresys.Open_eVision.EROIC48 colorDestinationImage
 )
```

Parameters

sourceImageOfColor0

Pointers to the three input gray-level component images/ROIs.

sourceImageOfColor1

Pointers to the three input gray-level component images/ROIs.

sourceImageOfColor2

Pointers to the three input gray-level component images/ROIs.

colorDestinationImage

Pointer to the output color image/ROI.

lookup

Pointer to the color lookup table, or NULL.

Remarks

If a color lookup is used, the resulting image undergoes the corresponding color transform. This way, it is possible to build an RGB image from the color planes of another system, or conversely.
A color image can be seen as a set of three color planes, each corresponding to a color component. The color planes are themselves continuous tone images. An EImageC24 contains three EImageBW8.

EasyColor.Decompose

Extracts the three color planes, considered as gray-level images, from a color image.

Namespace: Euresys.Open_eVision

[C#]

```
void Decompose(
 Euresys.Open_eVision.EROIC24 colorSourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImageOfColor0,
 Euresys.Open_eVision.EROIBW8 destinationImageOfColor1,
 Euresys.Open_eVision.EROIBW8 destinationImageOfColor2,
 Euresys.Open_eVision.EColorLookup lookup
 )
void Decompose(
 Euresys.Open_eVision.EROIC48 colorSourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImageOfColor0,
 Euresys.Open_eVision.EROIBW16 destinationImageOfColor1,
 Euresys.Open_eVision.EROIBW16 destinationImageOfColor2
 )
```

Parameters

colorSourceImage

Pointer to the input color image/ROI.

destinationImageOfColor0

Pointers to the three output gray level component images/ROIs.

destinationImageOfColor1

Pointers to the three output gray level component images/ROIs.

destinationImageOfColor2

Pointers to the three output gray level component images/ROIs.

lookup

Pointer to the color lookup table, or NULL.

Remarks

If a color lookup is used, the source image undergoes the corresponding color transform. This way, it is possible to get the RGB components from an image of another system, of conversely.
A color image can be seen as a set of three color planes, each corresponding to a color component. The color planes are themselves continuous tone images. An EImageC24 contains three EImageBW8.

EasyColor.Dequantize

Convert a quantized value to a unquantized value of a given color system.

Namespace: Euresys.Open_eVision

[C#]

```
void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EXYZ colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EYUV colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EYIQ colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.ELSH colorOut
 )
```

```
void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EVSH colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EISH colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EYSH colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.ELAB colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.ELCH colorOut
 )

void Dequantize(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.ELUV colorOut
 )
```

Parameters

colorIn

Input quantized color.

colorOut

Output unquantized color, as defined by the corresponding structure.

Remarks

Quantization is the process that transforms a continuous value, usually represented as a floating-point value in the [0..1] interval, into a discrete one, usually represented as an integer in the [0..255] interval.
Dequantization is the reverse process. For RGB color system, it undoes the gamma-correction corresponding to the current ERgbStandard.

EasyColor.DstQuantization

Quantization mode for output values.

Namespace: Euresys.Open_eVision

```
[C#]
static Euresys.Open_eVision.EColorQuantization DstQuantization
  { get; set; }
```

Remarks

These settings remain permanent and influence the relevant quantized and unquantized color conversions (during lookup table initialization or image color transformation). Quantization modes are set for the current thread.

EasyColor.Format422To444

Converts a YUV 4:2:2 image to a YUV 4:4:4 image using interpolation.

Namespace: Euresys.Open_eVision

[C#]

```
void Format422To444(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool yFirst
 )
```

Parameters

sourceImage

Pointer to the input image/ROI, stored using the 16 bits per pixel format.

destinationImage

Pointer to the output image/ROI.

yFirst

Flag indicating if the format is YUYVYUYV (true) or UYVYUYVY (false).

Remarks

In the YUV system, it has been established that sub-sampling the chroma components does not degrade the visual image quality. The 4:4:4 format uses three bytes of information by pixel. The 4:2:2 format is such that only the U and V chroma of the even pixels are kept and they are stored with the even and odd luma, as follows: Thus, only two bytes per pixel are required. $Y_{[even]}$ $U_{[even]}$ $Y_{[odd]}$ $V_{[even]}$

EasyColor.Format444To422

Converts a YUV 4:4:4 image to a YUV 4:2:2 image using filtering

Namespace: Euresys.Open_eVision

[C#]

```
void Format444To422(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 bool yFirst
 )
```

Parameters

sourceImage

Pointer to the input image/ROI.

destinationImage

Pointer to the output image/ROI, stored using the 16 bits per pixel format.

yFirst

Flag indicating if the format is YUYVYUYV (true) or UYVYUYVY (false).

Remarks

In the YUV system, it has been established that sub-sampling the chroma components does not degrade the visual image quality. The 4:4:4 format uses three bytes of information by pixel. The 4:2:2 format is such that only the U and V chroma of the even pixels are kept and they are stored with the even and odd luma, as follows: Thus, only two bytes per pixel are required. $Y_{[even]}$ $U_{[even]}$ $Y_{[odd]}$ $V_{[even]}$

EasyColor.GetComponent

Extracts one color plane, considered as a gray-level image, from a color image.

Namespace: Euresys.Open_eVision

```
[C#]
void GetComponent(
 Euresys.Open_eVision.EROIC24 colorSourceImage,
 Euresys.Open_eVision.EROIBW8 bWDestinationImage,
 uint component,
 Euresys.Open_eVision.EColorLookup lookup
 )
void GetComponent(
 Euresys.Open_eVision.EROIC48 colorSourceImage,
 Euresys.Open_eVision.EROIBW16 bWDestinationImage,
 uint component
 )
```

Parameters

colorSourceImage

Pointer to the input color image/ROI.

bWDestinationImage

Pointers to the output gray-level component image/ROI.

component

Color component index (0, 1, or 2).

lookup

Pointer to the color lookup table, or NULL.

EasyColor.ImproveClassCenters

Redefines the class centers by computing the average color value of the pixels assigned to each class in the source image.

Namespace: Euresys.Open_eVision

```
[C#]
void ImproveClassCenters(
 Euresys.Open_eVision.ERGBIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector classCenters
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

classCenters

Pointer to the vector of the class centers.

Remarks

This implements a step of the K-means method for unsupervised clustering.
Color image segmentation allows you to decompose a color image in different regions by assigning a "class" (integer index) to every pixel. The nearest neighbor method is used, i.e. for each class a representative center is specified, and a given pixel is associated to the class with the closest center.
Color image segmentation can be used in conjunction with EasyObject to perform blob analysis on the segmented regions.

EasyColor.IshToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

```
[C#]
void IshToRgb(
 Euresys.Open_eVision.EISH colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )

void IshToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.LabToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

[C#]

```
void LabToRgb(
 Euresys.Open_eVision.ELAB colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void LabToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.LabToXyz

Convert a color from one system to another.

Namespace: Euresys.Open_eVision

[C#]

```
void LabToXyz(
 Euresys.Open_eVision.ELAB colorIn,
 out Euresys.Open_eVision.EXYZ colorOut
 )
void LabToXyz(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.LchToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

[C#]

```
void LchToRgb(
 Euresys.Open_eVision.ELCH colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void LchToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.LshToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

```
[C#]
void LshToRgb(
 Euresys.Open_eVision.ELSH colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void LshToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.LuvToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

```
[C#]
void LuvToRgb(
 Euresys.Open_eVision.ELUV colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void LuvToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.LuvToXyz

Convert a color from one system to another.

Namespace: Euresys.Open_eVision

[C#]

```
void LuvToXyz(
 Euresys.Open_eVision.ELUV colorIn,
 out Euresys.Open_eVision.EXYZ colorOut
 )
void LuvToXyz(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.NtscGamma

NTSC gamma exponent

Namespace: Euresys.Open_eVision

[C#]

```
static float NtscGamma
  { get; }
```

EasyColor.PalGamma

PAL gamma exponent

Namespace: Euresys.Open_eVision

[C#]

```
static float PalGamma
  { get; }
```

EasyColor.PseudoColor

Applies the mapping defined by the pseudo-color lookup table to transform a gray-level image into a color image.

Namespace: Euresys.Open_eVision

[C#]

```
void PseudoColor(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EPseudoColorLookup lookup
 )
```

Parameters

sourceImage

Pointer to the source gray-level image.

destinationImage

Pointer to the destination color image.

lookup

Pointer to the pseudo-color lookup table.

Remarks

Pseudo-coloring is a convenient way to display gray-level images with enhanced contrast: a shade of colors is associated to the shade of gray-level values. A simple way to define the shade of colors is to specify a path in color space.
In order to use pseudo-coloring, a special lookup table is used: EPseudoColorLookup. It handles the mapping between the gray-level and color values.

EasyColor.Quantize

Convert an unquantized color of a given color system to a quantized color.

Namespace: Euresys.Open_eVision

[C#]

```
void Quantize(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.EXYZ colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.EYUV colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.EYIQ colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.ELSH colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.EVSH colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.EISH colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.EYSH colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.ELAB colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.ELCH colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )

void Quantize(
 Euresys.Open_eVision.ELUV colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input unquantized color, as defined by the corresponding structure.

colorOut

Output quantized color.

Remarks

Quantization is the process that transforms a continuous value, usually represented as a floating-point value in the [0..1] interval, into a discrete one, usually represented as an integer in the [0..255] interval.
Dequantization is the reverse process. For RGB color system, it applies gamma-correction corresponding to the current ERgbStandard.

EasyColor.RegisterPlanes

Sets a color plane of a color image by using a gray-level image as component.

Namespace: Euresys.Open_eVision

```
[C#]
void RegisterPlanes(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 int rShiftX,
 int gShiftX,
 int bShiftX,
 int rShiftY,
 int gShiftY,
 int bShiftY
 )
```

Parameters

sourceImage

Pointers to the input image/ROI.

destinationImage

Pointer to the output image/ROI.

rShiftX

Horizontal shifting of the first plane (the red one in case of an RGB image), expressed in pixels.

gShiftX

Horizontal shifting of the second plane (the green one in case of an RGB image), expressed in pixels.

bShiftX

Horizontal shifting of the third plane (the blue one in case of an RGB image), expressed in pixels.

rShiftY

Vertical shifting of the first plane (the red one in case of an RGB image), expressed in pixels.

gShiftY

Vertical shifting of the second plane (the green one in case of an RGB image), expressed in pixels.

bShiftY

Vertical shifting of the third plane (the blue one in case of an RGB image), expressed in pixels.

Remarks

A color image can be seen as a set of three color planes, each corresponding to a color component. The color planes are themselves continuous tone images. An EImageC24 contains three EImageBW8.

EasyColor.RgbStandard

RGB definition to be used when converting between RGB and other color systems.

Namespace: Euresys.Open_eVision

[C#]

```
static Euresys.Open_eVision.ERgbStandard RgbStandard
  { get; set; }
```

Remarks

Some variant of the color systems can be used. The EasyColor::SrcQuantization and EasyColor::DstQuantization functions are used to activate them.
These settings remain permanent and influence the relevant quantized and unquantized color conversions (during lookup table initialization or image color transformation).
RgbStandard is set for the current thread.

EasyColor.RgbToIsh

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToIsh(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EISH colorOut
 )

void RgbToIsh(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToLab

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToLab(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.ELAB colorOut
 )
void RgbToLab(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToLch

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToLch(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.ELCH colorOut
 )
void RgbToLch(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToLsh

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToLsh(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.ELSH colorOut
 )
void RgbToLsh(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToLuv

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

```
[C#]
void RgbToLuv(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.ELUV colorOut
 )
void RgbToLuv(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToReducedXyz

Convert a color from one system to another.

Namespace: Euresys.Open_eVision

```
[C#]
void RgbToReducedXyz(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EXYZ colorOut
 )
void RgbToReducedXyz(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToVsh

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

```
[C#]
void RgbToVsh(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EVSH colorOut
 )
void RgbToVsh(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToXyz

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToXyz(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EXYZ colorOut
 )
void RgbToXyz(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToYiq

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToYiq(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EYIQ colorOut
 )
void RgbToYiq(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToYsh

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToYsh(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EYSH colorOut
 )

void RgbToYsh(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.RgbToYuv

Convert a color from RGB to another system.

Namespace: Euresys.Open_eVision

[C#]

```
void RgbToYuv(
 Euresys.Open_eVision.ERGB colorIn,
 out Euresys.Open_eVision.EYUV colorOut
 )

void RgbToYuv(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color, as defined by the corresponding structure.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.SetComponent

Sets a color plane of a color image by using a gray-level image as component.

Namespace: Euresys.Open_eVision

[C#]

```
void SetComponent(
 Euresys.Open_eVision.EROIBW8 bWSourceImage,
 Euresys.Open_eVision.EROIC24 colorDestinationImage,
 uint component
 )

void SetComponent(
 Euresys.Open_eVision.EROIBW16 bWSourceImage,
 Euresys.Open_eVision.EROIC48 colorDestinationImage,
 uint component
 )
```

Parameters

bWSourceImage

Pointers to the input gray level component image/ROI.

colorDestinationImage

Pointer to the output color image/ROI.

component

Color component index (0, 1, or 2).

Remarks

A color image can be seen as a set of three color planes, each corresponding to a color component. The color planes are themselves continuous tone images. An EImageC24 contains three EImageBW8.

EasyColor.SmpteGamma

SMPTE gamma exponent

Namespace: Euresys.Open_eVision

[C#]

```
static float SmpteGamma
  { get; }
```

EasyColor.SrcQuantization

Quantization mode for input values.

Namespace: Euresys.Open_eVision

[C#]

```
static Euresys.Open_eVision.EColorQuantization SrcQuantization
  { get; set; }
```

Remarks

These settings remain permanent and influence the relevant quantized and unquantized color conversions (during lookup table initialization or image color transformation). Quantization modes are set for the current thread.

EasyColor.Transform

Applies a color transformation to a specified image.

Namespace: Euresys.Open_eVision

[C#]

```
void Transform(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EColorLookup lookup
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

lookup

Pointer to the color lookup.

Remarks

In the first case, the transformation is defined by a color lookup. See Initialization (EColorLookup).
In the two other cases, the user defines a quantized or unquantized color transformation. No intermediate color lookup table is used.
A color image can be seen as a set of three color planes, each corresponding to a color component. The color planes are themselves continuous tone images. An EImageC24 contains three EImageBW8.

EasyColor.TransformBayer

Converts an image, using the transformation defined by a color lookup. Deprecation notice: the version of this method taking two bool as argument is deprecated. You should use the one taking an EBayerConfiguration instead.

Namespace: Euresys.Open_eVision

[C#]

```
void TransformBayer(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EColorLookup lookup,
 Euresys.Open_eVision.EBayerConfiguration bayerConfiguration
 )
void TransformBayer(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EColorLookup lookup,
 bool evenCol,
 bool evenRow
 )
```

Parameters

sourceImage

Pointer to the source image/ROI. This image must be encoded using the Bayer color pattern.

destinationImage

Pointer to the destination image/ROI. This image must be encoded using the Bayer color pattern.

lookup

Pointer to the color lookup table holding the color adjustment transform. The lookup table must be previously set up by EColorLookup::WhiteBalance method (no other transforms are supported).

bayerConfiguration

The color configuration of the bayer image. The color configuration is defined by the component of the first 2 pixels of the image, see EBayerConfiguration.

evenCol

true if the leftmost destination image column can't contain blue pixels.

evenRow

true if the topmost destination image row can't contain red pixels.

Remarks

By contrast with EasyColor::Transform, the transformation is applied directly to Bayer-encoded data. This allows efficient processing to take place before conversion to the C24 format.

EasyColor.VshToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

[C#]

```
void VshToRgb(
 Euresys.Open_eVision.EVSH colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void VshToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.XyzToLab

Convert a color from one system to another.

Namespace: Euresys.Open_eVision

[C#]

```
void XyzToLab(
 Euresys.Open_eVision.EXYZ colorIn,
 out Euresys.Open_eVision.ELAB colorOut
 )
void XyzToLab(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.XyzToLuv

Convert a color from one system to another.

Namespace: Euresys.Open_eVision

[C#]

```
void XyzToLuv(
 Euresys.Open_eVision.EXYZ colorIn,
 out Euresys.Open_eVision.ELUV colorOut
 )
void XyzToLuv(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.XyzToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

[C#]

```
void XyzToRgb(
 Euresys.Open_eVision.EXYZ colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void XyzToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.YiqToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

```
[C#]
void YiqToRgb(
 Euresys.Open_eVision.EYIQ colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void YiqToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.YshToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

```
[C#]
void YshToRgb(
 Euresys.Open_eVision.EYSH colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void YshToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

EasyColor.YuvToRgb

Convert a color from any system to RGB.

Namespace: Euresys.Open_eVision

```
[C#]
void YuvToRgb(
 Euresys.Open_eVision.EYUV colorIn,
 out Euresys.Open_eVision.ERGB colorOut
 )
void YuvToRgb(
 Euresys.Open_eVision.EC24 colorIn,
 out Euresys.Open_eVision.EC24 colorOut
 )
```

Parameters

colorIn

Input color.

colorOut

Output color.

Remarks

These functions transform the color components (of a pixel) expressed in some color system to the corresponding components in another system. These functions take into account the current ERgbStandard and the associated white point if necessary.

4.23. EasyImage Class

This class contains static properties and methods specific to the EasyImage library.

Namespace: Euresys.Open_eVision

Properties

OverlayColor	Gets/Sets the color of the overlay in the destination image when a BW8 Image is used as overlay source image in functions.

Methods

AdaptiveThreshold	Performs a locally adaptive threshold on the source image.
AlphaBlend	Draws an image over an other.
AnalyseHistogram	Returns a floating-point statistical parameter extracted from a range of gray levels in an image histogram (most/least frequent value/frequency, min/max value, count, average, standard deviation).
AnalyseHistogramBW16	Returns a floating-point statistical parameter extracted from a range of gray levels in an image histogram (most/least frequent value/frequency, min/max value, count, average, standard deviation).
Area	Counts the pixels whose values are above (or on) a threshold.
AreaDoubleThreshold	Counts the pixels whose values are comprised between (or on) two thresholds.
ArgumentImage	Prepares a lookup-table image for use for gradient argument computation.
AutoThreshold	Returns a suitable threshold value for a gray-level image binarization.
BiLevelBlackTopHatBox	Performs a top-hat filtering on a bilevel image (closed image minus source image) on a rectangular kernel.
BiLevelBlackTopHatDisk	Performs a top-hat filtering on a bilevel image (closed image minus source image) on a quasi-circular kernel.
BiLevelCloseBox	Performs a closing on a bilevel image (dilation followed by erosion) on a rectangular kernel.
BiLevelCloseDisk	Performs a closing on a bilevel image (dilation followed by erosion) on a quasi-circular kernel.
BiLevelDilateBox	Performs a dilation on a bilevel image (maximum of the pixel values in a defined neighborhood) on a rectangular kernel. For bilevel images, this maximum can either be 0 (if all pixels are black in the given neighborhood), or the maximum possible pixel value.
BiLevelDilateDisk	Performs a dilation on a bilevel image (maximum of the pixel values in a defined neighborhood) on a quasi-circular kernel. For bilevel images, this maximum can either be 0 (if all pixels are black in the given neighborhood), or the maximum possible pixel value.
BiLevelErodeBox	Performs an erosion on a bilevel image (minimum of the pixel values in a defined neighborhood) on a rectangular kernel. For bilevel images, this minimum can either be 0, or the maximum possible pixel value (if all pixels are white in the given neighborhood)

BiLevelErodeDisk	Performs an erosion on a bilevel image (minimum of the pixel values in a defined neighborhood) on a quasi-circular kernel. For bilevel images, this minimum can either be 0, or the maximum possible pixel value (if all pixels are white in the given neighborhood)
BiLevelMedian	Applies a median filter to a bilevel image (median of the gray values in a 3x3 neighborhood).
BiLevelMorphoGradientBox	Computes the morphological gradient of a bilevel image using a rectangular kernel.
BiLevelMorphoGradientDisk	Computes the morphological gradient of a bilevel image using a quasi-circular kernel.
BiLevelOpenBox	Performs an opening on a bilevel image (erosion followed by dilation) on a rectangular kernel.
BiLevelOpenDisk	Performs an opening on a bilevel image (erosion followed by dilation) on a quasi-circular kernel.
BiLevelThick	Applies a thickening operation on a bilevel image, using a 3x3 kernel.
BiLevelThin	Applies a thinning operation on a bilevel image, using a 3x3 kernel.
BiLevelWhiteTopHatBox	Performs a top-hat filtering on a bilevel image (source image minus open image) on a rectangular kernel.
BiLevelWhiteTopHatDisk	Performs a top-hat filtering on a bilevel image (source image minus open image) on a quasi-circular kernel.
BinaryMoments	Computes the zero-th, first or second order moments on the binarized image, i.e. with a unit weight for those pixels with a value above or equal to the threshold, and zero otherwise.
BlackTopHatBox	Performs a top-hat filtering on an image (closed image minus source image) on a rectangular kernel.
BlackTopHatDisk	Performs a top-hat filtering on an image (closed image minus source image) on a circular kernel.
CloseBox	Performs a closing on an image (dilation followed by erosion) on a rectangular kernel.
CloseDisk	Performs a closing on an image (dilation followed by erosion) on a circular kernel.
Contour	Follows the *contour* of an object.
Convert	Transforms the contents of an image to an image of another type.
ConvertTo422	Turns an 8-bit gray-level image into a YUV 4:2:2 encoded color image.
ConvolGabor	Computes the Gabor filter response of the source image and stores the result in the destination image.
ConvolGaussian	Applies Gaussian filtering (binomial weights) in rectangular kernel of odd size.
ConvolGradient	Extracts the edges of an image by summing the absolute values of the Gradient X and Gradient Y derivatives and stores the absolute value (magnitude) of the result in the destination image.
ConvolGradientX	Derives an image along X using a Gradient kernel and stores the absolute value (magnitude) of the result in the destination image.

ConvolGradientY	Derives an image along Y using a Gradient kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolHighpass1	Filters an image using a 3x3 high-pass kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolHighpass2	Filters an image using a 3x3 high-pass kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolKernel	Performs a convolution in image space, i.e. applies a convolution kernel.
ConvolLaplacian4	Takes the second derivative of an image using a 4-neighbor Laplacian kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolLaplacian8	Takes the second derivative of an image using an 8-neighbor Laplacian kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolLaplacianX	Takes the horizontal second derivative and stores the absolute value (magnitude) of the result in the destination image.
ConvolLaplacianY	Takes the vertical second derivative and stores the absolute value (magnitude) of the result in the destination image.
ConvolLowpass1	Filters an image using a 3x3 low-pass kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolLowpass2	Filters an image using a 3x3 low-pass kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolLowpass3	Filters an image using a 3x3 low-pass kernel.
ConvolPrewitt	Extracts the edges of an image by summing the absolute values of the Prewitt X and Prewitt Y derivatives and stores the absolute value (magnitude) of the result in the destination image.
ConvolPrewittX	Derives an image along X using a Prewitt kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolPrewittY	Derives an image along Y using a Prewitt kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolRoberts	The Roberts edge extraction filter is based on a 2x2 kernel.
ConvolSobel	Extracts the edges of an image by summing the absolute values of the Sobel X and Sobel Y derivatives.
ConvolSobelX	Derives an image along X using a Sobel kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolSobelY	Derives an image along Y using a Sobel kernel and stores the absolute value (magnitude) of the result in the destination image.
ConvolSymmetricKernel	Performs a convolution in image space, i.e. applies a square symmetric convolution kernel of size 3x3, 5x5 or 7x7.
ConvolUniform	Applies strong low-pass filtering to an image by using a uniform rectangular kernel of odd size.
Copy	Copies a source image or a constant in a destination image.
CumulateHistogram	Cumulates histogram values in another histogram.

DilateBox	Performs a dilation on an image (maximum of the gray values in a defined neighborhood) on a rectangular kernel.
DilateDisk	Performs a dilation on an image (maximum of the gray values in a defined neighborhood) on a circular kernel.
Distance	Computes the morphological distance function on a binary image (0 for black, non 0 for white).
DoubleThreshold	Converts an image by setting all pixels below the low threshold to a low value, all pixels above the high threshold to a high value, and the remaining pixels to an intermediate value.
Equalize	Equalizes an image histogram (the gray levels are re-mapped so that the histogram becomes as close to uniform as possible).
ErodeBox	Performs an erosion on an image (minimum of the gray values in a defined neighborhood) on a rectangular kernel.
ErodeDisk	Performs an erosion on an image (minimum of the gray values in a defined neighborhood) on a circular kernel.
Flip	Flip an image around either the vertical axis, the horizontal axis or both.
Focusing	Returns a measure of the focusing of an image by computing the total gradient energy.
Gain	Transforms an image, applying a gain and offset to all pixels.
GainOffset	Transforms an image, applying a gain and offset to all pixels.
GetFrame	Extracts the frame of given parity from an image.
GetProfilePeaks	Detects peaks in a gray-level profile. Maxima as well as minima are considered.
GradientScalar	Computes the (scalar) gradient image derived from a given source image.
GravityCenter	Computes the coordinates of the gravity center of an image, i.e. the average coordinates of the pixels above (or on) the threshold.
HDRFusion	Fuses two images using HDR principles.
Histogram	Computes the histogram of an image (count of each gray-level value).
HistogramThreshold	Determines an appropriate threshold level based on the histogram contents, using an automatic threshold mode.
HistogramThresholdBW16	Determines an appropriate threshold level based on the histogram contents, using an automatic threshold mode.
HitAndMiss	Apply the morphological hit-and-miss transform to detect a particular pattern of foreground and background pixels in a BW8, BW16 or C24 image/ROI.
HorizontalMirror	Mirrors an image horizontally (the columns are swapped).
ImageToLineSegment	Copies the pixel values along a given line segment (arbitrarily oriented) to a vector.
ImageToPath	Given a path described by coordinates in a path vector, copies the corresponding pixel values into the same vector.

IsodataThreshold	Computes a suitable threshold value for a histogram.
IsodataThresholdBW16	Computes a suitable threshold value for a histogram.
LinearTransform	Applies a general affine transformation.
LineSegmentToImage	Copies the pixel values from a vector or a constant to the pixels of a given line segment (arbitrarily oriented).
LocalAverage	Computes the average in a rectangular window centered on every pixel.
LocalDeviation	Computes the standard deviation in a rectangular window centered on every pixel.
Lut	Transforms the gray levels of an image, using a lookup table stored in a vector (of unsigned values).
MatchFrames	Determines the optimal shift amplitude by comparing two successive lines of the image.
Median	Applies a median filter to an image (median of the gray values in a neighborhood). Kernel may be of an arbitrary size except for EROIBW1 where it is always 3*3.
ModulusImage	Prepares a lookup-table image for use for gradient magnitude computation.
MorphoGradientBox	Computes the morphological gradient of an image using a rectangular kernel.
MorphoGradientDisk	Computes the morphological gradient of an image using a circular kernel.
Normalize	Normalizes an image, i.e. applies a linear transform to the gray levels so that their average and standard deviation are imposed.
Offset	Transforms an image, applying a gain and offset to all pixels.
OpenBox	Performs an opening on an image (erosion followed by dilation) on a rectangular kernel.
OpenDisk	Performs an opening on an image (erosion followed by dilation) on a circular kernel.
Oper	Applies the desired arithmetic or logic pixel-wise operator between two images or constants.
Overlay	Overlays an image on the top of a color image, at a given position.
PathToImage	Given a path described by coordinates in a path vector, copies the pixel values from the path vector to the corresponding image pixels.
PixelAverage	Computes the average pixel value in a gray-level or color image.
PixelCompare	Counts the number of pixels differing between two images.
PixelCount	Counts the pixels in the three value classes separated by two thresholds.
PixelMax	Computes the maximum gray-level value in an image.
PixelMaxBW16	Computes the maximum gray-level value in an image.
PixelMaxBW8	Computes the maximum gray-level value in an image.

PixelMin	Computes the minimum gray-level value in an image.
PixelMinBW16	Computes the minimum gray-level value in an image.
PixelMinBW8	Computes the minimum gray-level value in an image.
PixelStat	Computes the minimum, maximum and average gray-level values in an image.
PixelStatBW16	Computes the minimum, maximum and average gray-level values in an image.
PixelStatBW8	Computes the minimum, maximum and average gray-level values in an image.
PixelStdDev	Computes the average gray-level or color value in an image, the standard deviation of the color components, and the correlation between the color components (in the case of color images).
PixelVariance	For a gray-level image, computes the mean and variance of the pixel values.
ProfileDerivative	Computes the first derivative of a profile extracted from a gray-level image.
ProjectOnAColumn	Projects an image horizontally onto a column.
ProjectOnARow	Projects an image vertically onto a row.
RealignFrame	Shifts one frame of the image horizontally.
RebuildFrame	Rebuilds one frame of the image by interpolation between the lines of the other frame.
RecursiveAverage	Applies stronger noise reduction to small variations and conversely.
Register	Registers an image by realigning one, two or three pivot points to reference positions.
RmsNoise	Computes the root-mean-square amplitude of noise, by comparing a given image to a reference image.
Rotate	Rotate an image by an increment of a quarter of a turn (right angle).
ScaleRotate	Re-scales an image by an arbitrary factor and/or rotates it by an arbitrary angle.
SetCircleWarp	Prepares suitable warp images for use with function EasyImage::Warp to unwarp a circular ring-wedge shape into a straight rectangle. This is a cartesian to polar image conversion function. See also EasyImage::SetInvCircleWarp.
SetFrame	Replaces the frame of given parity in an image.
SetInvCircleWarp	Prepares suitable warp images for use with function EasyImage::Warp to unwarp a straight rectangle into a circular ring-wedge shape. This is a polar to cartesian image conversion function. See also EasyImage::SetCircleWarp.
SetRecursiveAverageLUT	Pre-compute the required non-linear transfer function for noise reduction by recursive temporal averaging.
SetupEqualize	Prepares a lookup-table for image equalization, using an image histogram.

SetupInverseWarp	Prepares suitable inverse warp images for use with function EasyImage::Warp to unwarp an invertible LUT given by the warpImageX and warpImageY.
Shrink	Resizes an image to a smaller size. Pre-filtering is applied to avoid aliasing.
SignalNoiseRatio	Computes the signal to noise ratio, in dB, by comparing a given image to a reference image.
SwapFrames	Interchanges the even and odd rows of an image.
Thick	Applies a thickening operation on an image, using a 3x3 kernel.
Thin	Applies a thinning operation on an image, using a 3x3 kernel.
ThreeLevelsMinResidueThreshold	Computes the two threshold values used to separate the pixels of an image in three classes.
Threshold	Binarize an image by setting pixels to two different possible values in a destination image, according to their value in a source image.
Transpose	Transpose an image.
TwoLevelsMinResidueThreshold	Computes the threshold value used to separate the pixels of an image in two classes.
Uniformize	Shading correction is the process of transforming the gray or color component values of an image, using one or two reference images or vectors.
VerticalMirror	Mirrors an image vertically (the rows are swapped).
Warp	Transforms an image so that each pixels are moved to the locations specified in the "warp" images used as look-up tables.
WeightedMoments	Computes the zero-th, first, second, third or fourth order weighted moments on the gray-level image. The weight of a pixel is its gray-level value.
WhiteTopHatBox	Performs a top-hat filtering on an image (source image minus open image) on a rectangular kernel.
WhiteTopHatDisk	Performs a top-hat filtering on an image (source image minus open image) on a circular kernel.

EasyImage.AdaptiveThreshold

Performs a locally adaptive threshold on the source image.

Namespace: Euresys.Open_eVision

```
[C#]
void AdaptiveThreshold(
 Euresys.Open_eVision.EROIBW8 src,
 Euresys.Open_eVision.EROIBW8 dst,
 Euresys.Open_eVision.EAdaptiveThresholdMethod method,
 int halfKernelSize,
 int constant
 )
```

Parameters

src

-

dst

-

method

The thresholding mode, as defined by the enumeration EAdaptiveThresholdMethod.

halfKernelSize

Half width of the kernel rounded down

constant

Constant offset applied to the threshold value. By default (argument omitted) 0, i.e. no change.

Remarks

Kernel size is always odd.

EasyImage.AlphaBlend

Draws an image over an other.

Namespace: Euresys.Open_eVision

```
[C#]
void AlphaBlend(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 double opacity
 )
```

Parameters

sourceImage

Foreground image.

destinationImage

Background image.

opacity

Opacity of the foreground image.

EasyImage.AnalyseHistogram

Returns a floating-point statistical parameter extracted from a range of gray levels in an image histogram (most/least frequent value/frequency, min/max value, count, average, standard deviation).

Namespace: Euresys.Open_eVision

```
[C#]
float AnalyseHistogram(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 Euresys.Open_eVision.EHistogramFeature operation,
 int minimumIndex,
 int maximumIndex
 )
```

Parameters

histogram

Pointer to the histogram vector.

operation

Parameter to be computed, as defined by EHistogramFeature.

minimumIndex

Starting index of the gray-level range.

maximumIndex

Ending index of the gray-level range.

EasyImage.AnalyseHistogramBW16

Returns a floating-point statistical parameter extracted from a range of gray levels in an image histogram (most/least frequent value/frequency, min/max value, count, average, standard deviation).

Namespace: Euresys.Open_eVision

```
[C#]
float AnalyseHistogramBW16(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 Euresys.Open_eVision.EHistogramFeature operation,
 int minimumIndex,
 int maximumIndex
 )
```

Parameters

histogram
Pointer to the histogram vector.

operation
Parameter to be computed, as defined by EHistogramFeature.

minimumIndex
Starting index of the gray-level range.

maximumIndex
Ending index of the gray-level range.

EasyImage.Area

Counts the pixels whose values are above (or on) a threshold.

Namespace: Euresys.Open_eVision

[C#]

```
void Area(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 threshold,
 out int numberOfPixelsAboveThreshold
 )

void Area(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 threshold,
 out int numberOfPixelsAboveThreshold
 )

void Area(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 threshold,
 out int numberOfPixelsAboveThreshold
 )

void Area(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 threshold,
 out int numberOfPixelsAboveThreshold
 )

void Area(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 threshold,
 out int numberOfPixelsAboveThreshold
 )
```

```
void Area(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 threshold,
 out int numberOfPixelsAboveThreshold
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

threshold

The pixel thresholding value used to count the pixels

numberOfPixelsAboveThreshold

Reference to the count of pixels above or equal to the threshold.

region

Pointer to a region to apply the function only on a particular region in the image.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.AreaDoubleThreshold

Counts the pixels whose values are comprised between (or on) two thresholds.

Namespace: Euresys.Open_eVision

[C#]

```
void AreaDoubleThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out int numberOfPixelsBetweenThresholds
 )

void AreaDoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out int numberOfPixelsBetweenThresholds
 )

void AreaDoubleThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out int numberOfPixelsBetweenThresholds
 )
```

```
void AreaDoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out int numberOfPixelsBetweenThresholds
 )
void AreaDoubleThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out int numberOfPixelsBetweenThresholds
 )
void AreaDoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out int numberOfPixelsBetweenThresholds
 )
```

Parameters

sourceImage
: Pointer to the source image/ROI.

lowThreshold
: Inferior threshold.

highThreshold
: Superior threshold.

numberOfPixelsBetweenThresholds
: Reference to the count of pixels that are above or equal to the inferior threshold, and strictly below the superior threshold.

region
: Pointer to a region to apply the function only on a particular region in the image.

mask
: Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.ArgumentImage

Prepares a lookup-table image for use for gradient argument computation.

Namespace: Euresys.Open_eVision

[C#]

```
void ArgumentImage(
 Euresys.Open_eVision.EImageBW8 destinationImage,
 Euresys.Open_eVision.EBW8 phase,
 float period
 )
void ArgumentImage(
 Euresys.Open_eVision.EImageBW8 destinationImage
 )
void ArgumentImage(
 Euresys.Open_eVision.EImageBW8 destinationImage,
 Euresys.Open_eVision.EBW8 phase
 )
```

Parameters

destinationImage

Pointer to the destination image.

phase

Argument value corresponding to the horizontal direction, in 256-th (65,536-th) of the period (by default, phase = 0).

period

Range of argument values corresponding to the 0..255 (0..65535) interval, in the current angle unit (by default, period = 0).

Remarks

The scale and phase of the gradient argument can be adjusted. The argument angles are counter clockwise on a 0..255 scale in the BW8 context and on a 0..65535 scale in the BW16 one, corresponding to a specified range (full turn by default, specified period otherwise). The argument phase is counted on a 0..255 scale or on a 0..65535 scale too. Angle values outside the 0..255 (0..65535) interval are wrapped. The period length is given in the current angle unit. EasyImage::ArgumentImage sets a lookup-table image for use with function EasyImage::GradientScalar, ready to compute the argument of the gradient in the source image, i.e. its direction. The argument will be returned as a value in range 0..255 suitable for storage in an EImageBW8 or as a value in the range 0..65535 suitable for storage in an EImageBW16. The phase of the argument can be adjusted.

EasyImage.AutoThreshold

Returns a suitable threshold value for a gray-level image binarization.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW8 AutoThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EThresholdMode thresholdMode,
 float relativeThresholdMode
 )
```

```
Euresys.Open_eVision.EBW16 AutoThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EThresholdMode thresholdMode,
 float relativeThresholdMode
 )

Euresys.Open_eVision.EBW8 AutoThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EThresholdMode thresholdMode,
 float relativeThresholdMode
 )

Euresys.Open_eVision.EBW16 AutoThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EThresholdMode thresholdMode,
 float relativeThresholdMode
 )

Euresys.Open_eVision.EBW8 AutoThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EThresholdMode thresholdMode,
 float relativeThresholdMode
 )

Euresys.Open_eVision.EBW16 AutoThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EThresholdMode thresholdMode,
 float relativeThresholdMode
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

thresholdMode

The thresholding mode, as defined by the enumeration EThresholdMode. To use absolute thresholding, use directly the threshold value instead.

relativeThresholdMode

Fraction of the image pixels that will be set below the threshold. Only used when the threshold value is Relative (by default, relativeThresholdMode = 0.5).

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

region

An Eregion object to apply the function only on a particular region in the image.

Remarks

Several modes are available: absolute (the threshold value is given readily in the thresholdMode parameter), relative (the threshold value is computed to obtain a desired fraction of the image pixels) or automatic (using three different criteria).

It is possible that, in the automatic or relative thresholding modes, the computed threshold exceeds the dynamic range of the return type. In this case, the value is clipped to the maximum value that is representable in the return type.

EasyImage.BiLevelBlackTopHatBox

Performs a top-hat filtering on a bilevel image (closed image minus source image) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelBlackTopHatBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

Remarks

This filter enhances the thin black features.

EasyImage.BiLevelBlackTopHatDisk

Performs a top-hat filtering on a bilevel image (closed image minus source image) on a quasi-circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelBlackTopHatDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

Remarks

This filter enhances the thin black features.

EasyImage.BiLevelCloseBox

Performs a closing on a bilevel image (dilation followed by erosion) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelCloseBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

EasyImage.BiLevelCloseDisk

Performs a closing on a bilevel image (dilation followed by erosion) on a quasi-circular kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelCloseDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

EasyImage.BiLevelDilateBox

Performs a dilation on a bilevel image (maximum of the pixel values in a defined neighborhood) on a rectangular kernel.
For bilevel images, this maximum can either be 0 (if all pixels are black in the given neighborhood), or the maximum possible pixel value.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelDilateBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

EasyImage.BiLevelDilateDisk

Performs a dilation on a bilevel image (maximum of the pixel values in a defined neighborhood) on a quasi-circular kernel.
For bilevel images, this maximum can either be 0 (if all pixels are black in the given neighborhood), or the maximum possible pixel value.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelDilateDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth =1; 0 is allowed).

EasyImage.BiLevelErodeBox

Performs an erosion on a bilevel image (minimum of the pixel values in a defined neighborhood) on a rectangular kernel.
For bilevel images, this minimum can either be 0, or the maximum possible pixel value (if all pixels are white in the given neighborhood)

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelErodeBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

EasyImage.BiLevelErodeDisk

Performs an erosion on a bilevel image (minimum of the pixel values in a defined neighborhood) on a quasi-circular kernel.
For bilevel images, this minimum can either be 0, or the maximum possible pixel value (if all pixels are white in the given neighborhood)

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelErodeDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

EasyImage.BiLevelMedian

Applies a median filter to a bilevel image (median of the gray values in a 3x3 neighborhood).

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelMedian(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half height of the kernel minus one (by default, same as halfOfKernelWidth; 0 is allowed).

EasyImage.BiLevelMorphoGradientBox

Computes the morphological gradient of a bilevel image using a rectangular kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelMorphoGradientBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

Remarks

The morphological gradient is the difference between the dilation and the erosion of the image, using the same structuring element.
The kernel size is a pair of odd numbers; they must be halved before they are passed. For instance, a 3x5 kernel is passed as 1x2.

EasyImage.BiLevelMorphoGradientDisk

Computes the morphological gradient of a bilevel image using a quasi-circular kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelMorphoGradientDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

Remarks

The morphological gradient is the difference between the dilation and the erosion of the image, using the same structuring element.

EasyImage.BiLevelOpenBox

Performs an opening on a bilevel image (erosion followed by dilation) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelOpenBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

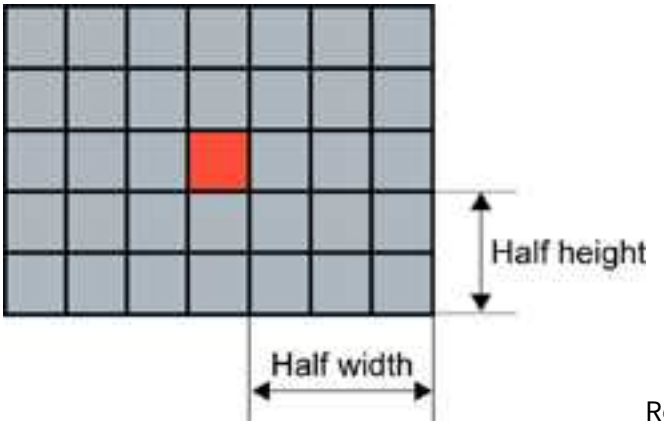
halfOfKernelWidth

Half of the box width minus one, as shown on the picture below (by default, halfOfKernelWidth =1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one, as shown on the picture below (by default, same as halfOfKernelWidth; 0 is allowed).

Remarks



Rectangular kernel of half width = 3 and half height = 2

EasyImage.BiLevelOpenDisk

Performs an opening on a bilevel image (erosion followed by dilation) on a quasi-circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelOpenDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one, as shown on the picture below (by default, halfOfKernelWidth = 1; 0 is allowed).

EasyImage.BiLevelThick

Applies a thickening operation on a bilevel image, using a 3x3 kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelThick(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel thickeningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

thickeningKernel

Pointer to the thickening kernel.

rotationMode

Rotation mode, as defined by EKernelRotation.

numberOfIterations

Number of iterations to apply. 0 indicates stop when convergence is reached. Upon return, gives the number of passes actually performed. If the rotation mode is set to either Clockwise or Anticlockwise, a pass comprises eight kernel rotations.

Remarks

The thickening kernel coefficients must be 0 (matching black pixel, value 0), 1 (matching non black pixel, value > 0) or -1 (don't care). When a match is found between the kernel coefficients and the neighborhood of a pixel, the pixel value is set to 255.

EasyImage.BiLevelThin

Applies a thinning operation on a bilevel image, using a 3x3 kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelThin(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel thinningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

thinningKernel

Pointer to the thinning kernel.

rotationMode

Rotation mode, as defined by EKernelRotation.

numberOfIterations

Number of iterations to apply. 0 indicates stop when convergence is reached. Upon return, gives the number of passes actually performed. If the rotation mode is set to either Clockwise or Anticlockwise, a pass comprises eight kernel rotations.

Remarks

The thinning kernel coefficients must be 0 (matching black pixel, value 0), 1 (matching non black pixel, value > 0) or -1 (don't care). When a match is found between the kernel coefficients and the neighborhood of a pixel, the pixel value is set to 0.

EasyImage.BiLevelWhiteTopHatBox

Performs a top-hat filtering on a bilevel image (source image minus open image) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BiLevelWhiteTopHatBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

Remarks

This filter enhances the thin white features.

EasyImage.BiLevelWhiteTopHatDisk

Performs a top-hat filtering on a bilevel image (source image minus open image) on a quasi-circular kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void BiLevelWhiteTopHatDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

Remarks

This filter enhances the thin white features.

EasyImage.BinaryMoments

Computes the zero-th, first or second order moments on the binarized image, i.e. with a unit weight for those pixels with a value above or equal to the threshold, and zero otherwise.

Namespace: Euresys.Open_eVision

[C#]

```
void BinaryMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint threshold,
 out float M,
 out float Mx,
 out float My
 )

void BinaryMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 uint threshold,
 out float M,
 out float Mx,
 out float My
 )

void BinaryMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint threshold,
 out float M,
 out float Mx,
 out float My
 )

void BinaryMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint threshold,
 out float M,
 out float Mx,
 out float My
 )

void BinaryMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 uint threshold,
 out float M,
 out float Mx,
 out float My
 )

void BinaryMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 uint threshold,
 out float M,
 out float Mx,
 out float My
 )
```

```
void BinaryMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint threshold,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void BinaryMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 uint threshold,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void BinaryMoments(
 Euresys.Open_eVision.EROIBW8 sourceImageconst,
 Euresys.Open_eVision.ERegion region,
 uint threshold,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void BinaryMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint threshold,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
```

```
void BinaryMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 uint threshold,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void BinaryMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 uint threshold,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

threshold
Binarization threshold.

M
Reference to the zero-th order moment (area).

Mx
Reference to the first-order, uncentered moments (weighted sum of abscissas).

My
Reference to the first-order, uncentered moments (weighted sum of ordinates).

region
Pointer to a region to apply the function only on a particular region in the image.

mask
Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

Mxx
Reference to the second-order, uncentered moments (weighted sum of squared abscissas).

Mxy
Reference to the second-order, uncentered moments (weighted sum of cross-product of abscissas and ordinates).

Myy
Reference to the second-order, uncentered moments (weighted sum of squared ordinates).

sourceImageconst

-

EasyImage.BlackTopHatBox

Performs a top-hat filtering on an image (closed image minus source image) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BlackTopHatBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void BlackTopHatBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void BlackTopHatBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void BlackTopHatBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void BlackTopHatBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void BlackTopHatBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void BlackTopHatBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

Remarks

This filter enhances the thin black features.

EasyImage.BlackTopHatDisk

Performs a top-hat filtering on an image (closed image minus source image) on a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
```

```
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void BlackTopHatDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

region

Region to apply the function on.

Remarks

This filter enhances the thin black features.

EasyImage.CloseBox

Performs a closing on an image (dilation followed by erosion) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void CloseBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void CloseBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void CloseBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void CloseBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void CloseBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void CloseBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void CloseBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

EasyImage.CloseDisk

Performs a closing on an image (dilation followed by erosion) on a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void CloseDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )

void CloseDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )

void CloseDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )

void CloseDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )

void CloseDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
```

```
void CloseDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void CloseDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

region

Region to apply the function on.

EasyImage.Contour

Follows the *contour* of an object.

Namespace: Euresys.Open_eVision

[C#]

```
void Contour(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EContourMode contourMode,
 int startX,
 int startY,
 Euresys.Open_eVision.EContourThreshold thresholdMode,
 uint threshold,
 Euresys.Open_eVision.EConnexity connexity,
 Euresys.Open_eVision.EPathVector path
 )
```

```
void Contour(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EContourMode contourMode,
 int startX,
 int startY,
 Euresys.Open_eVision.EContourThreshold thresholdMode,
 uint threshold,
 Euresys.Open_eVision.EConnexity connexity,
 Euresys.Open_eVision.EPathVector path
 )
void Contour(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EContourMode contourMode,
 int startX,
 int startY,
 Euresys.Open_eVision.EContourThreshold thresholdMode,
 uint threshold,
 Euresys.Open_eVision.EConnexity connexity,
 Euresys.Open_eVision.EBW8PathVector path,
 bool freeman
 )
void Contour(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EContourMode contourMode,
 int startX,
 int startY,
 Euresys.Open_eVision.EContourThreshold thresholdMode,
 uint threshold,
 Euresys.Open_eVision.EConnexity connexity,
 Euresys.Open_eVision.EBW16PathVector path,
 bool freeman
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

contourMode
Traversal mode, as defined by EContourMode.

startX
Start point abscissa.

startY
Start point ordinate.

thresholdMode
Thresholding mode as defined by EThresholdMode.

threshold
Threshold level.

connexity
Contour connexity, as defined by EConnexity.

path

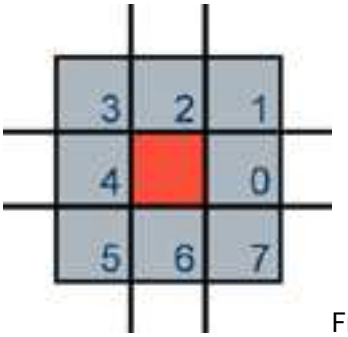
Pointer to the destination vector.

freeman

Specifies if Freeman codes are to be retrieved rather than pixel values.

Remarks

A threshold is applied so that objects become blobs. The contour is a closed or not (see property Get/SetClosed) connected path, forming the boundary of the blob.
When destination vector is an EBW8PathVector or a EBW16PathVector, this vector can contain two different information. If the bFreeman argument is false, which is the default value, member m_bw8(16)Pixel in the vector elements contains the gray-level value of the contour pixels. If it is true, the member instead gives the Freeman code leading from a pixel to next. The Freeman codes are numbered from 0 in the horizontal direction and incremented anticlockwise.



Freeman code, leading from a pixel to another adjacent pixel

EasyImage.Convert

Transforms the contents of an image to an image of another type.

Namespace: Euresys.Open_eVision

```
[C#]
void Convert(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void Convert(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Convert(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC15 destinationImage
 )
void Convert(
 Euresys.Open_eVision.EROIC15 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

```
void Convert(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC15 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC15 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC16 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC16 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC16 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC16 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24A destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC24A sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint rightShift
 )

void Convert(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint rightShift
 )

void Convert(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint rightShift
 )
```

```
void Convert(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint leftShift
 )

void Convert(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW32 destinationImage,
 uint leftShift
 )

void Convert(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW32 destinationImage,
 uint leftShift
 )

void Convert(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 sourceImageAlpha,
 Euresys.Open_eVision.EROIC24A destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIC24A sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EROIBW8 destinationImageAlpha
 )

void Convert(
 Euresys.Open_eVision.EROIC48 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint rightShift
 )

void Convert(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC48 destinationImage,
 uint leftShift
 )

void Convert(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )

void Convert(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
```

```
void Convert(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBW8 highValue
 )
void Convert(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void Convert(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EBW16 highValue
 )
void Convert(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void Convert(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW32 destinationImage,
 Euresys.Open_eVision.EBW32 highValue
 )
void Convert(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW32 destinationImage
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

destinationImage
Pointer to the destination image/ROI.

rightShift
Right shift amplitude. By default, left justified data is assumed.

leftShift
Left shift amplitude. By default, left justified data is assumed.

sourceImageAlpha
Pointer to the source alpha component (EImageBW8/EROIBW8).

destinationImageAlpha
Pointer to the destination alpha component (EImageBW8/EROIBW8).

highValue
In the case of black and white source images/ROIs, indicates to which gray level the value 1 should be mapped. By default, 1 is mapped to the highest allowed value for the destination image/ROI.

Remarks

Conversion to a black and white image (BW1)
Turns an 8-bit gray-level image into a black and white image.
Turns a 16-bit gray-level image into a black and white image.
Turns a 32-bit gray-level image into a black and white image.
Source pixels whose values is 0 are converted to black. All other source pixel values are converted to white.
Conversion to a 8-bit gray-level image (BW8)
Turns a black and white image into an 8-bit gray-level image.
Turns a 16-bit gray-level image into an 8-bit gray-level image. A right shift can be applied to the 16-bit data to adjust the magnitude, depending on how the 16-bit data is organized. For instance, if the source image holds 10 significant bits right justified, a right shift of 2 is required to drop the 2 low order bits; if the source image holds 12 bits left justified, a right shift of 8 is required and the 4 low order bits will be truncated.
Turns an EC15, EC16 or EC24 color image into an EBW8 gray-level image. The 3 color components are averaged following an equation based on the current ERgbStandard.
Conversion to a 16-bit gray-level image (BW16)
Turns a black and white image into a 16-bit gray-level image.
Turns an 8-bit gray-level image into a 16-bit gray-level image. A left shift can be applied to the 8-bit data to adjust the magnitude, depending on how the 16-bit data is organized. For instance, if the destination image holds 10 significant bits right justified, a shift of 2 is required; if the destination image holds 12 bits left justified, a shift of 8 is required.
Conversion to a 32-bit gray-level image (BW32)
Turns a black and white image into a 32-bit gray-level image.
Conversion to color images
Turns an 8-bit gray-level image into a true color equivalent. The color components are all set equal to the corresponding gray-level value.
Converts between standard and Windows' packing RGB color formats. When converting from an EC24 image to a EC15 or EC16 one, only the 5 (or 6) most significant bits of each color component are retained.
Converts between RGB 24-bit color image and RGB32 (also known as RGBA) color image. When converting from EC24 to EC24A, you can choose to provide or not the alpha component. On the other hand, when converting from EC24A to EC24, you can choose to conserve or not the alpha component. The alpha component is retrieved and set using an EImageBW8/EROIBW8.

EasyImage.ConvertTo422

Turns an 8-bit gray-level image into a YUV 4:2:2 encoded color image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvertTo422(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

Remarks

The Y component is set to the corresponding gray-level values, while the U and V components are set to 128 (achromatic light).

EasyImage.ConvolGabor

Computes the Gabor filter response of the source image and stores the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolGabor(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
void ConvolGabor(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
```

```
void ConvolGabor(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
void ConvolGabor(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
void ConvolGabor(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
void ConvolGabor(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
```

```
void ConvolGabor(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
void ConvolGabor(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 float sigma,
 float gamma,
 float theta,
 float lambda,
 float psi,
 bool normalize
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

halfOfKernelWidth
Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight
Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

sigma
Spread of the Gaussian envelope. This value cannot be zero.

gamma
Ellipticity of the Gaussian.

theta
Orientation of the Gaussian and of the sine wave.

lambda
Wavelength of the sine wave. This value cannot be zero.

psi
Phase offset of the sine wave.

normalize
Specifies whether the kernel should undergo a normalization by the sum of its components before applying the convolution.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

EasyImage.ConvolGaussian

Applies Gaussian filtering (binomial weights) in rectangular kernel of odd size.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolGaussian(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ConvolGaussian(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ConvolGaussian(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ConvolGaussian(
 Euresys.Open_eVision.EBW8Vector sourceImage,
 Euresys.Open_eVision.EBW8Vector destinationImage,
 uint halfOfKernelWidth
 )

void ConvolGaussian(
 Euresys.Open_eVision.EBW16Vector sourceImage,
 Euresys.Open_eVision.EBW16Vector destinationImage,
 uint halfOfKernelWidth
 )

void ConvolGaussian(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void ConvolGaussian(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void ConvolGaussian(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

EasyImage.ConvolGradient

Extracts the edges of an image by summing the absolute values of the Gradient X and Gradient Y derivatives and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolGradient(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolGradient(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

```
void ConvolGradient(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolGradient(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolGradient(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolGradient(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

EasyImage.ConvolGradientX

Derives an image along X using a Gradient kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolGradientX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolGradientX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

```
void ConvolGradientX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolGradientX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolGradientX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolGradientX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 0 0 0-1 0 1 0 0 0

EasyImage.ConvolGradientY

Derives an image along Y using a Gradient kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolGradientY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
```

```
void ConvolGradientY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolGradientY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolGradientY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolGradientY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolGradientY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 0 -1 00 0 00 1 0

EasyImage.ConvolHighpass1

Filters an image using a 3x3 high-pass kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolHighpass1(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolHighpass1(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolHighpass1(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolHighpass1(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolHighpass1(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolHighpass1(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 0 -1 0-1 5 -1 0 -1 0

EasyImage.ConvolHighpass2

Filters an image using a 3x3 high-pass kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolHighpass2(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolHighpass2(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolHighpass2(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolHighpass2(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolHighpass2(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolHighpass2(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: -1 -1 -1-1 9 -1-1 -1 -1

EasyImage.ConvolKernel

Performs a convolution in image space, i.e. applies a convolution kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolKernel(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
void ConvolKernel(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
void ConvolKernel(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
void ConvolKernel(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
void ConvolKernel(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
void ConvolKernel(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
```

Parameters

sourceImage
: Pointer to the source image/ROI.

destinationImage
: Pointer to the destination image/ROI.

kernel
: Pointer to the convolution kernel.

region
: Region to apply the function on.

EasyImage.ConvolLaplacian4

Takes the second derivative of an image using a 4-neighbor Laplacian kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolLaplacian4(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacian4(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacian4(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolLaplacian4(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacian4(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacian4(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 0 1 01 -4 10 1 0

EasyImage.ConvolLaplacian8

Takes the second derivative of an image using an 8-neighbor Laplacian kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolLaplacian8(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacian8(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacian8(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolLaplacian8(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacian8(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacian8(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 1 1 11 -8 11 1 1

EasyImage.ConvolLaplacianX

Takes the horizontal second derivative and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolLaplacianX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacianX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacianX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolLaplacianX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacianX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacianX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 1 -2 1

EasyImage.ConvolLaplacianY

Takes the vertical second derivative and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolLaplacianY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacianY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacianY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolLaplacianY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLaplacianY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLaplacianY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 1-2 1

EasyImage.ConvolLowpass1

Filters an image using a 3x3 low-pass kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolLowpass1(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLowpass1(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLowpass1(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolLowpass1(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLowpass1(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLowpass1(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 1 1 11 1 11 1 1

EasyImage.ConvolLowpass2

Filters an image using a 3x3 low-pass kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolLowpass2(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLowpass2(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLowpass2(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolLowpass2(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolLowpass2(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolLowpass2(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 1 1 11 0 11 1 1

EasyImage.ConvolLowpass3

Filters an image using a 3x3 low-pass kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolLowpass3(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolLowpass3(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolLowpass3(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void ConvolLowpass3(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolLowpass3(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolLowpass3(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: 1 2 12 4 21 2 1

EasyImage.ConvolPrewitt

Extracts the edges of an image by summing the absolute values of the Prewitt X and Prewitt Y derivatives and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolPrewitt(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolPrewitt(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolPrewitt(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void ConvolPrewitt(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolPrewitt(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolPrewitt(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

EasyImage.ConvolPrewittX

Derives an image along X using a Prewitt kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolPrewittX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolPrewittX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolPrewittX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void ConvolPrewittX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolPrewittX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolPrewittX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: -1 0 1-1 0 1-1 0 1

EasyImage.ConvolPrewittY

Derives an image along Y using a Prewitt kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolPrewittY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolPrewittY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolPrewittY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void ConvolPrewittY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolPrewittY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolPrewittY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: -1 -1 -1 0 0 0 1 1 1

EasyImage.ConvolRoberts

The Roberts edge extraction filter is based on a 2x2 kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolRoberts(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolRoberts(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolRoberts(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolRoberts(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolRoberts(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolRoberts(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

It computes the sum of absolute differences of the pixel values in the diagonal directions.

EasyImage.ConvolSobel

Extracts the edges of an image by summing the absolute values of the Sobel X and Sobel Y derivatives.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolSobel(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolSobel(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolSobel(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolSobel(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolSobel(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolSobel(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

EasyImage.ConvolSobelX

Derives an image along X using a Sobel kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolSobelX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolSobelX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolSobelX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void ConvolSobelX(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void ConvolSobelX(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void ConvolSobelX(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: -1 0 1-2 0 2-1 0 1

EasyImage.ConvolSobelY

Derives an image along Y using a Sobel kernel and stores the absolute value (magnitude) of the result in the destination image.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvolSobelY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolSobelY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolSobelY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void ConvolSobelY(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void ConvolSobelY(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void ConvolSobelY(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

region

Region to apply the function on.

Remarks

Filtering kernel: -1 -2 -1 0 0 0 1 2 1

EasyImage.ConvolSymmetricKernel

Performs a convolution in image space, i.e. applies a square symmetric convolution kernel of size 3x3, 5x5 or 7x7.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolSymmetricKernel(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )

void ConvolSymmetricKernel(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )

void ConvolSymmetricKernel(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )

void ConvolSymmetricKernel(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )

void ConvolSymmetricKernel(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )

void ConvolSymmetricKernel(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EKernel kernel
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

destinationImage
Pointer to the destination image/ROI.

kernel
Pointer to the convolution kernel.

region
Region to apply the function on.

Remarks

This function is a synonym for EasyImage::ConvolKernel.

EasyImage.ConvolUniform

Applies strong low-pass filtering to an image by using a uniform rectangular kernel of odd size.

Namespace: Euresys.Open_eVision

[C#]

```
void ConvolUniform(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ConvolUniform(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ConvolUniform(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ConvolUniform(
 Euresys.Open_eVision.EBW8Vector sourceVector,
 Euresys.Open_eVision.EBW8Vector destinationVector,
 uint halfOfKernelWidth
 )

void ConvolUniform(
 Euresys.Open_eVision.EBW16Vector sourceVector,
 Euresys.Open_eVision.EBW16Vector destinationVector,
 uint halfOfKernelWidth
 )
```

```
void ConvolUniform(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void ConvolUniform(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void ConvolUniform(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image) and the default value for un32HalfWidth (1) has to be used.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

sourceVector

Pointer to the source vector.

destinationVector

Pointer to the destination vector. If NULL (default), this operation is destructive (i.e. applied to the source vector) and the default value for un32HalfWidth (1) has to be used.

region

Region to apply the function on.

Remarks

This filter replaces every pixel values by the arithmetic mean of the neighboring values in a rectangular window. To handle pixels along edges, the source pixels are replicated outwards as many times as required.
A very nice feature of this function is that its running time does not depend on the kernel size!

EasyImage.Copy

Copies a source image or a constant in a destination image.

Namespace: Euresys.Open_eVision

[C#]

```
void Copy(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EROIBW32 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC24A sourceImage,
 Euresys.Open_eVision.EROIC24A destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC15 sourceImage,
 Euresys.Open_eVision.EROIC15 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC16 sourceImage,
 Euresys.Open_eVision.EROIC16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC48 sourceImage,
 Euresys.Open_eVision.EROIC48 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EBW16 constant,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

```
void Copy(
 Euresys.Open_eVision.EBW32 constant,
 Euresys.Open_eVision.EROIBW32 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC24 constant,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC15 constant,
 Euresys.Open_eVision.EROIC15 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC16 constant,
 Euresys.Open_eVision.EROIC16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EBW8 constant,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC24A constant,
 Euresys.Open_eVision.EROIC24A destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC48 constant,
 Euresys.Open_eVision.EROIC48 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW32 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC48 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC48 destinationImage
 )
```

```
void Copy(
 Euresys.Open_eVision.EROIC24A sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24A destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC15 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC15 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EROIC16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EBW8 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EBW16 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EBW32 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW32 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC48 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC48 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EC24A constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24A destinationImage
 )
```

```
void Copy(
 Euresys.Open_eVision.EC24 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Copy(
 Euresys.Open_eVision.EC15 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC15 destinationImage
 )
void Copy(
 Euresys.Open_eVision.EC16 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC16 destinationImage
 )
void Copy(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
void Copy(
 Euresys.Open_eVision.EBW1 constant,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

destinationImage
Pointer to the destination image/ROI.

constant
Gray-level or color constant.

region
Region on which to copy.

EasyImage.CumulateHistogram

Cumulates histogram values in another histogram.

Namespace: Euresys.Open_eVision

[C#]

```
void CumulateHistogram(
 Euresys.Open_eVision.EBWHistogramVector sourceVector,
 Euresys.Open_eVision.EBWHistogramVector destinationVector
 )
```

Parameters

sourceVector

Pointer to the source vector.

destinationVector

Pointer to the destination vector.

Remarks

Calling this function after EasyImage::Histogram allows you to compute the cumulative histogram of an image, i.e. the count of pixels below a given threshold value (instead of the count of pixels with a given gray value, as computed by EasyImage::Histogram).

EasyImage.DilateBox

Performs a dilation on an image (maximum of the gray values in a defined neighborhood) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void DilateBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void DilateBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void DilateBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void DilateBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void DilateBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void DilateBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void DilateBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

EasyImage.DilateDisk

Performs a dilation on an image (maximum of the gray values in a defined neighborhood) on a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void DilateDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

```
void DilateDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
void DilateDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void DilateDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
void DilateDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
void DilateDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void DilateDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth =1; 0 is allowed).

region

Region to apply the function on.

EasyImage.Distance

Computes the morphological distance function on a binary image (0 for black, non 0 for white).

Namespace: Euresys.Open_eVision

```
[C#]
void Distance(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EImageBW16 destinationImage,
 int valueOutOfImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

valueOutOfImage

Out-of-bounds image value. By default, this value is 0.

Remarks

So, each pixel of the destination image will contain, at the end of the processing, the morphological distance of the corresponding pixel in the source image. The distance function at a given pixel tells how many erosion passes are required to set it to black.

EasyImage.DoubleThreshold

Converts an image by setting all pixels below the low threshold to a low value, all pixels above the high threshold to a high value, and the remaining pixels to an intermediate value.

Namespace: Euresys.Open_eVision

```
[C#]
void DoubleThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint lowThreshold,
 uint highThreshold,
 byte lowValue,
 byte middleValue,
 byte highValue
 )
```

```
void DoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint lowThreshold,
 uint highThreshold,
 Euresys.Open_eVision.EBW16 lowValue,
 Euresys.Open_eVision.EBW16 middleValue,
 Euresys.Open_eVision.EBW16 highValue
 )
void DoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint lowThreshold,
 uint highThreshold
 )
void DoubleThreshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint lowThreshold,
 uint highThreshold,
 byte lowValue,
 byte middleValue,
 byte highValue
 )
void DoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint lowThreshold,
 uint highThreshold,
 Euresys.Open_eVision.EBW16 lowValue,
 Euresys.Open_eVision.EBW16 middleValue,
 Euresys.Open_eVision.EBW16 highValue
 )
void DoubleThreshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint lowThreshold,
 uint highThreshold
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

lowThreshold

Low threshold value.

highThreshold

High threshold value.

lowValue

Value for pixels strictly below the low threshold.

middleValue

Value for pixels that are above or equal to the low threshold, and below or equal the high threshold.

highValue

Value for pixels strictly above to the high threshold.

region

Pointer to a region to apply the function only on a particular region in the image.

EasyImage.Equalize

Equalizes an image histogram (the gray levels are re-mapped so that the histogram becomes as close to uniform as possible).

Namespace: Euresys.Open_eVision

[C#]

```
void Equalize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void Equalize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

Remarks

This strongly enhances the contrast in dark areas.

EasyImage.ErodeBox

Performs an erosion on an image (minimum of the gray values in a defined neighborhood) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void ErodeBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ErodeBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ErodeBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ErodeBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ErodeBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void ErodeBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void ErodeBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

EasyImage.ErodeDisk

Performs an erosion on an image (minimum of the gray values in a defined neighborhood) on a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void ErodeDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )

void ErodeDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )

void ErodeDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
```

```
void ErodeDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
void ErodeDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
void ErodeDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void ErodeDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

region

Region to apply the function on.

EasyImage.Flip

Flip an image around either the vertical axis, the horizontal axis or both.

Namespace: Euresys.Open_eVision

[C#]

```
void Flip(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EFlipAxis axis
 )
```

```
void Flip(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EFlipAxis axis
 )
void Flip(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EFlipAxis axis
 )
void Flip(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EFlipAxis axis
 )
void Flip(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EFlipAxis axis
 )
void Flip(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EFlipAxis axis
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. May not be the same as the source image.

axis

Axis around which the ROI flips.

Remarks

Destination image/roi size should be the same as the source image/roi size.

EasyImage.Focusing

Returns a measure of the focusing of an image by computing the total gradient energy.

Namespace: Euresys.Open_eVision

[C#]

```
float Focusing(
 Euresys.Open_eVision.EROIBW8 image
 )
float Focusing(
 Euresys.Open_eVision.EROIBW16 image
 )
```

```
float Focusing(
 Euresys.Open_eVision.EROIC24 image
 )
```

Parameters

image

Pointer to the source image/ROI.

Remarks

When this quantity is maximum for a given image, sharp focusing is achieved.
For more information, please refer to the section **Using Open eVision -> EasyImage -> Computing Image Statistics -> Image Focus** in the documentation.

EasyImage.Gain

Transforms an image, applying a gain and offset to all pixels.

Namespace: Euresys.Open_eVision

[C#]

```
void Gain(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EColor Gain
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

Gain

Constant gain. By default (argument omitted) 1, i.e. no change.

Remarks

The gain should remain close to 1, and allows contrast adjustment of the image.

The offset can be positive or negative, and allows to adjust the image intensity. The resulting values are always saturated to range [0..255].

For color images, the separate gain and offset values are specified as triple of values stored in a EColor. The default values leave the image unchanged.

Internally, the computations are achieved through fixed-point arithmetic with 5 bits of precision for the fractional part. This can result in loss of precision with small gains.

EasyImage.GainOffset

Transforms an image, applying a gain and offset to all pixels.

Namespace: Euresys.Open_eVision

```
[C#]
void GainOffset(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 float gain,
 float offset
 )
void GainOffset(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float gain,
 float offset
 )
void GainOffset(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EColor gain,
 Euresys.Open_eVision.EColor offset
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

gain

Constant gain. By default (argument omitted) 1, i.e. no change.

offset

Constant offset. By default (argument omitted) 0, i.e. no change.

Remarks

The gain should remain close to 1, and allows contrast adjustment of the image.

The offset can be positive or negative, and allows to adjust the image intensity. The resulting values are always saturated to range [0..255].

For color images, the separate gain and offset values are specified as triple of values stored in a EColor. The default values leave the image unchanged.

Internally, the computations are achieved through fixed-point arithmetic with 5 bits of precision for the fractional part. This can result in loss of precision with small gains.

EasyImage.GetFrame

Extracts the frame of given parity from an image.

Namespace: Euresys.Open_eVision

```
[C#]
void GetFrame(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool odd
 )
void GetFrame(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 bool odd
 )
void GetFrame(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool odd
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

odd

Specifies which frame is extracted (the frame made up of all lines of the same parity as odd).

Remarks

The size of the destination image is determined as follows:
DstImage_Width = SrcImage_Width
DstImage_Height = (SrcImage_Height + 1 - odd) / 2

EasyImage.GetProfilePeaks

Detects peaks in a gray-level profile. Maxima as well as minima are considered.

Namespace: Euresys.Open_eVision

[C#]

```
void GetProfilePeaks(
 Euresys.Open_eVision.EBW8Vector profile,
 Euresys.Open_eVision.EPeakVector peaks,
 uint lowThreshold,
 uint highThreshold,
 uint minimumAmplitude,
 uint minimumArea
 )
void GetProfilePeaks(
 Euresys.Open_eVision.EBW16Vector profile,
 Euresys.Open_eVision.EPeakVector peaks,
 uint lowThreshold,
 uint highThreshold,
 uint minimumAmplitude,
 uint minimumArea
 )
```

Parameters

profile

Pointer to the source vector.

peaks

Pointer to the destination vector.

lowThreshold

Threshold used for the minimum peaks.

highThreshold

Threshold used for the maximum peaks.

minimumAmplitude

Minimum amplitude required for a peak to be kept (may be 0).

minimumArea

Minimum area required for a peak to be kept (may be 0).

Remarks

To eliminate false peaks due to noise, two selection criteria are used.
A peak is the portion of the signal that is above [below] a given threshold. The peak amplitude is defined to be the difference between the threshold value and the maximum [minimum] signal value. The peak area is defined to be the surface comprised between the signal curve and the horizontal line at the given threshold.
The result is stored in a peaks vector.

EasyImage.GradientScalar

Computes the (scalar) gradient image derived from a given source image.

Namespace: Euresys.Open_eVision

[C#]

```
void GradientScalar(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EROIBW8 lookupTable
 )
void GradientScalar(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EROIBW8 lookupTable
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

lookupTable

Pointer to the image/ROI used as a preset lookup-table. This lookup table can be generated by one of EasyImage::ArgumentImage or EasyImage::ModulusImage, or be user-defined.

Remarks

The scalar value derived from the gradient depends on the preset lookup-table image.
The gradient of a gray-scale image corresponds to a vector, the components of which are the partial derivatives of the gray-level signal in the horizontal and vertical direction. A vector can be characterized by a direction and a length, corresponding to the gradient orientation, here called *argument*, and the gradient magnitude, here called *magnitude*.
Function EasyImage::GradientScalar generates a gradient direction or gradient magnitude map (gray-level image) from a given gray-level image. For efficiency, a pre-computed lookup-table is used to define the desired transformation. This lookup-table is stored as a standard EImageBW8/EImageBW16. Use one of EasyImage::ArgumentImage or EasyImage::ModulusImage once before calling EasyImage::GradientScalar.

EasyImage.GravityCenter

Computes the coordinates of the gravity center of an image, i.e. the average coordinates of the pixels above (or on) the threshold.

Namespace: Euresys.Open_eVision

[C#]

```
void GravityCenter(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint threshold,
 out float gravityX,
 out float gravityY
 )
```

```
void GravityCenter(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 uint threshold,
 out float gravityX,
 out float gravityY
 )
void GravityCenter(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint threshold,
 out float gravityX,
 out float gravityY
 )
void GravityCenter(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint threshold,
 out float gravityX,
 out float gravityY
 )
void GravityCenter(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 uint threshold,
 out float gravityX,
 out float gravityY
 )
void GravityCenter(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 uint threshold,
 out float gravityX,
 out float gravityY
 )
```

Parameters

sourceImage
: Pointer to the source image/ROI.

threshold
: Threshold.

gravityX
: Reference to the gravity center abscissa.

gravityY
: Reference to the gravity center ordinate.

region
: Pointer to a region to apply the function only on a particular region in the image.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.HDRFusion

Fuses two images using HDR principles.

Namespace: Euresys.Open_eVision

[C#]

```
void HDRFusion(
 Euresys.Open_eVision.EROIBW8 darkSrc,
 Euresys.Open_eVision.EROIBW8 lightSrc,
 int shutterSpeedFactor,
 Euresys.Open_eVision.EROIBW16 dst
 )

void HDRFusion(
 Euresys.Open_eVision.EROIBW16 darkSrc,
 Euresys.Open_eVision.EROIBW16 lightSrc,
 int shutterSpeedFactor,
 Euresys.Open_eVision.EROIBW16 dst
 )

void HDRFusion(
 Euresys.Open_eVision.EROIBW16 darkSrc,
 Euresys.Open_eVision.EROIBW16 lightSrc,
 int shutterSpeedFactor,
 Euresys.Open_eVision.EROIBW32 dst
 )

void HDRFusion(
 Euresys.Open_eVision.EROIC24 darkSrc,
 Euresys.Open_eVision.EROIC24 lightSrc,
 int shutterSpeedFactor,
 Euresys.Open_eVision.EROIC48 dst
 )

void HDRFusion(
 Euresys.Open_eVision.EROIC48 darkSrc,
 Euresys.Open_eVision.EROIC48 lightSrc,
 int shutterSpeedFactor,
 Euresys.Open_eVision.EROIC48 dst
 )
```

Parameters

darkSrc
Dark input image (high shutter speed).

lightSrc
Light input image (low shutter speed).

shutterSpeedFactor
Shutter speed factor between light and dark image.

dst
Destination image.

EasyImage.Histogram

Computes the histogram of an image (count of each gray-level value).

Namespace: Euresys.Open_eVision

[C#]

```
void Histogram(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBWHistogramVector histogram
 )
void Histogram(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBWHistogramVector histogram
 )
void Histogram(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint mostSignificantBit,
 uint numberOfSignificantBits,
 bool saturate
 )
void Histogram(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint mostSignificantBit,
 uint numberOfSignificantBits,
 bool saturate
 )
void Histogram(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint mostSignificantBit,
 uint numberOfSignificantBits,
 bool saturate
 )
```

```
void Histogram(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBWHistogramVector histogram
 )
void Histogram(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint mostSignificantBit,
 uint numberOfSignificantBits,
 bool saturate
 )
void Histogram(
 Euresys.Open_eVision.EROIBW32 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint mostSignificantBit,
 uint numberOfSignificantBits,
 bool saturate
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

histogram

Pointer to the destination vector.

region

Pointer to a region to apply the function only on a particular region in the image.

mostSignificantBit

Index of the most significant bit of the pixels (0 has weight 1).

numberOfSignificantBits

Number of significant bits; the histogram will possess $2^{numberOfSignificantBits}$ entries.

saturate

Boolean indicating if values larger than $2^{mostSignificantBit}-1$ are saturated (default true) or not (false).

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.HistogramThreshold

Determines an appropriate threshold level based on the histogram contents, using an automatic threshold mode.

Namespace: Euresys.Open_eVision

```
[C#]
void HistogramThreshold(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 ref uint threshold,
 out float averageOfPixelsBelowThreshold,
 out float averageOfPixelsAboveThreshold,
 float relativeThreshold,
 uint from,
 uint to
 )
```

Parameters

histogram

Pointer to a vector conaining an image histogram.

threshold

reference to the threshold value. Before calling the function, must be set to the appropriate thresholding mode, as defined by EThresholdMode.

averageOfPixelsBelowThreshold

Average gray level of the dark pixels (below threshold).

averageOfPixelsAboveThreshold

Average gray level of the light pixels (above threshold).

relativeThreshold

Relative threshold value, relevant only in the Relative mode.

from

Lower bound of the analyzed gray-level range.

to

Upper bound of the analyzed gray-level range.

Remarks

Additionally, returns the average gray levels in the regions below and above the threshold. The threshold level can be computed by analyzing a range of gray levels in the histogram.

EasyImage.HistogramThresholdBW16

Determines an appropriate threshold level based on the histogram contents, using an automatic threshold mode.

Namespace: Euresys.Open_eVision

```
[C#]
void HistogramThresholdBW16(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 ref uint threshold,
 out float averageOfPixelsBelowThreshold,
 out float averageOfPixelsAboveThreshold,
 float relativeThreshold,
 uint from,
 uint to
 )
```

Parameters

histogram

Pointer to a vector conaining an image histogram.

threshold

reference to the threshold value. Before calling the function, must be set to the appropriate thresholding mode, as defined by EThresholdMode.

averageOfPixelsBelowThreshold

Average gray level of the dark pixels (below threshold).

averageOfPixelsAboveThreshold

Average gray level of the light pixels (above threshold).

relativeThreshold

Relative threshold value, relevant only in the Relative mode.

from

Lower bound of the analyzed gray-level range.

to

Upper bound of the analyzed gray-level range.

Remarks

Additionally, returns the average gray levels in the regions below and above the threshold. The threshold level can be computed by analyzing a range of gray levels in the histogram.

EasyImage.HitAndMiss

Apply the morphological hit-and-miss transform to detect a particular pattern of foreground and background pixels in a BW8, BW16 or C24 image/ROI.

Namespace: Euresys.Open_eVision

```
[C#]
void HitAndMiss(
 Euresys.Open_eVision.EROIBW8 source,
 Euresys.Open_eVision.EROIBW8 destination,
 Euresys.Open_eVision.EHitAndMissKernel kernel
 )
```

```
void HitAndMiss(
 Euresys.Open_eVision.EROIBW16 source,
 Euresys.Open_eVision.EROIBW16 destination,
 Euresys.Open_eVision.EHitAndMissKernel kernel
 )
void HitAndMiss(
 Euresys.Open_eVision.EROIC24 source,
 Euresys.Open_eVision.EROIC24 destination,
 Euresys.Open_eVision.EHitAndMissKernel kernel
 )
```

Parameters

source

The source image/ROI.

destination

The destination image/ROI.

kernel

The hit-and-miss kernel.

EasyImage.HorizontalMirror

Mirrors an image horizontally (the columns are swapped).

Namespace: Euresys.Open_eVision

```
[C#]
void HorizontalMirror(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void HorizontalMirror(
 Euresys.Open_eVision.EROIC24 sourceImage
 )
void HorizontalMirror(
 Euresys.Open_eVision.EROIBW16 sourceImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

EasyImage.ImageToLineSegment

Copies the pixel values along a given line segment (arbitrarily oriented) to a vector.

Namespace: Euresys.Open_eVision

[C#]

```
void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 outOfMaskValue,
 Euresys.Open_eVision.EBW8Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 outOfMaskValue,
 Euresys.Open_eVision.EBW16Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )
```

```
void ImageToLineSegment(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EC24 outOfMaskValue,
 Euresys.Open_eVision.EC24Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8Vector path,
 Euresys.Open_eVision.ELine line
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16Vector path,
 Euresys.Open_eVision.ELine line
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector path,
 Euresys.Open_eVision.ELine line
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 outOfMaskValue,
 Euresys.Open_eVision.EBW8Vector path,
 Euresys.Open_eVision.ELine line
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 outOfMaskValue,
 Euresys.Open_eVision.EBW16Vector path,
 Euresys.Open_eVision.ELine line
 )

void ImageToLineSegment(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EC24 outOfMaskValue,
 Euresys.Open_eVision.EC24Vector path,
 Euresys.Open_eVision.ELine line
 )
```

```
void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 outOfMaskValue,
 Euresys.Open_eVision.EBW8Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )
void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 outOfMaskValue,
 Euresys.Open_eVision.EBW16Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )
void ImageToLineSegment(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EC24 outOfMaskValue,
 Euresys.Open_eVision.EC24Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )
void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 outOfMaskValue,
 Euresys.Open_eVision.EBW8Vector path,
 Euresys.Open_eVision.ELine line
 )
void ImageToLineSegment(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 outOfMaskValue,
 Euresys.Open_eVision.EBW16Vector path,
 Euresys.Open_eVision.ELine line
 )
```

```
void ImageToLineSegment(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EC24 outOfMaskValue,
 Euresys.Open_eVision.EC24Vector path,
 Euresys.Open_eVision.ELine line
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

path

Pointer to the destination vector.

X0

Coordinates of the starting point of the segment.

Y0

Coordinates of the starting point of the segment.

X1

Coordinates of the ending point of the segment.

Y1

Coordinates of the ending point of the segment.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

outOfMaskValue

The value to be given to the pixels that lie out of the mask or the region.

line

A Eline object

region

Reference to a region to apply the function only on a particular region in the image.

Remarks

The line segment must be wholly contained within the image. The vector length is adjusted automatically.

EasyImage.ImageToPath

Given a path described by coordinates in a path vector, copies the corresponding pixel values into the same vector.

Namespace: Euresys.Open_eVision

[C#]

```
void ImageToPath(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 outOfMaskValue,
 Euresys.Open_eVision.EBW8PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 outOfMaskValue,
 Euresys.Open_eVision.EBW16PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EC24 outOfMaskValue,
 Euresys.Open_eVision.EC24PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 outOfMaskValue,
 Euresys.Open_eVision.EBW8PathVector path
 )

void ImageToPath(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 outOfMaskValue,
 Euresys.Open_eVision.EBW16PathVector path
 )
```

```
void ImageToPath(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EC24 outOfMaskValue,
 Euresys.Open_eVision.EC24PathVector path
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

path

Pointer to the destination vector.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

outOfMaskValue

The value to be given to the pixels that lie out of the mask.

region

Reference to a region to apply the function only on a particular region in the image.

EasyImage.IsodataThreshold

Computes a suitable threshold value for a histogram.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW8 IsodataThreshold(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint from,
 uint to
 )
```

Parameters

histogram

Pointer to a vector containing an image histogram.

from

Lower bound of the useful gray-level interval (by default, 0).

to

Upper bound of the useful gray-level interval (by default, 255).

Remarks

The "isodata" rule is used: if one computes the average gray level of pixels below the threshold and the average gray level of pixels above the threshold, the threshold lies exactly halfway between them. Optionally, the threshold selection can be restricted to a range of gray-level values.

It is possible that, in the automatic or relative thresholding modes, the computed threshold exceeds the dynamic range of the return type. In this case, the value is clipped to the maximum value that is representable in the return type.

EasyImage.IsodataThresholdBW16

Computes a suitable threshold value for a histogram.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW16 IsodataThresholdBW16(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 uint from,
 uint to
 )
```

Parameters

histogram

Pointer to a vector containing an image histogram.

from

Lower bound of the useful gray-level interval (by default, 0).

to

Upper bound of the useful gray-level interval (by default, 65535).

Remarks

The "isodata" rule is used: if one computes the average gray level of pixels below the threshold and the average gray level of pixels above the threshold, the threshold lies exactly halfway between them. Optionally, the threshold selection can be restricted to a range of gray-level values.
Returns the threshold.

EasyImage.LinearTransform

Applies a general affine transformation.

Namespace: Euresys.Open_eVision

[C#]

```
void LinearTransform(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 float Axx,
 float Axy,
 float Ax,
 float Ayx,
 float Ayy,
 float Ay,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 int interpolationBits
 )

void LinearTransform(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 float Axx,
 float Axy,
 float Ax,
 float Ayx,
 float Ayy,
 float Ay,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 int interpolationBits
 )

void LinearTransform(
 Euresys.Open_eVision.EROIC24 sourceImage,
 float Axx,
 float Axy,
 float Ax,
 float Ayx,
 float Ayy,
 float Ay,
 Euresys.Open_eVision.EROIC24 destinationImage,
 int interpolationBits
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

Axx

See formula below.

Axy

See formula below.

Ax

See formula below.

Ayx

See formula below.

Ayy

See formula below.

Ay

See formula below.

destinationImage

Pointer to the destination image/ROI.

interpolationBits

Number of bits of accuracy for interpolation. Allowed values are 0 (no interpolation, nearest neighbor), 4 (linear interpolation) or 8 (cubic interpolation).

Remarks

An affine transformation is an important class of linear 2D geometric transformations which maps variables (e.g. pixel intensity values located at position (X_{Src}, Y_{Src}) in an input image) into new variables (e.g. (X_{Dst}, Y_{Dst}) in an output image) by applying a linear combination of translation, rotation, scaling and/or shearing (i.e. non-uniform scaling in some directions) operations.
The parameters of the EasyImage::LinearTransform function are the coefficients of the affine equations below:

$$X_{Dst} = A_{xx}X_{Src} + A_{xy}Y_{Src} + A_x$$

$$Y_{Dst} = A_{yx}X_{Src} + A_{yy}Y_{Src} + A_y$$

EasyImage.LineSegmentToImage

Copies the pixel values from a vector or a constant to the pixels of a given line segment (arbitrarily oriented).

Namespace: Euresys.Open_eVision

[C#]

```
void LineSegmentToImage(
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBW8 pixel,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void LineSegmentToImage(
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EBW16 pixel,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void LineSegmentToImage(
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EC24 pixel,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void LineSegmentToImage(
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBW8Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void LineSegmentToImage(
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EBW16Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )

void LineSegmentToImage(
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EC24Vector path,
 int X0,
 int Y0,
 int X1,
 int Y1
 )
```

Parameters

destinationImage
Pointer to the destination image/ROI.

pixel
Constant color value.

X0
Coordinates of the starting point of the segment.

Y0
Coordinates of the starting point of the segment.

X1
Coordinates of the ending point of the segment.

Y1
Coordinates of the ending point of the segment.

path
Pointer to the source vector.

Remarks

The line segment must be wholly contained within the image.

EasyImage.LocalAverage

Computes the average in a rectangular window centered on every pixel.

Namespace: Euresys.Open_eVision

[C#]

```
void LocalAverage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfWidth,
 uint halfHeight
 )
void LocalAverage(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfWidth,
 uint halfHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

halfWidth

Half of the window width minus one.

halfHeight

Half of the window height minus one.

Remarks

The window dimensions can be an arbitrary odd integer.
The running time of this function does not depend on the window size.

EasyImage.LocalDeviation

Computes the standard deviation in a rectangular window centered on every pixel.

Namespace: Euresys.Open_eVision

```
[C#]
void LocalDeviation(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfWidth,
 uint halfHeight
 )
void LocalDeviation(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfWidth,
 uint halfHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfWidth

Half of the window width minus one.

halfHeight

Half of the window height minus one.

Remarks

The window dimensions can be an arbitrary odd integer.
The running time of this function does not depend on the window size.

EasyImage.Lut

Transforms the gray levels of an image, using a lookup table stored in a vector (of unsigned values).

Namespace: Euresys.Open_eVision

[C#]

```
void Lut(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EBW16Vector lookupTable
 )
void Lut(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBW8Vector lookupTable
 )
void Lut(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBW8Vector lookupTable,
 uint numberOfScalingBits
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

lookupTable

Pointer to the lookup vector.

numberOfScalingBits

Number of scaling bits (or right padding bits).

Remarks

A 16-bit image usually does not make use of its 16 bits. In most cases, only 10 or 12 bits are used. These bits are called *significant bits*. In the 16-bit information, significant bits can be left aligned, right aligned or not aligned at all. To indicate which are the significant bits, we have to tell how many bits are significant and the number of right padding bits (0 right padding bit means that significant bits are right aligned).

The number of significant bits is given by the number of Look Up table entries. For example a Lut of 1024 entries is used for an image of 10 significant bits (as $2^{10} = 1024$).

The number of right padding bits is given by means of the numberOfScalingBits parameter. Leaving this parameter undefined indicates that the significant bits are left aligned on the word.

EasyImage.MatchFrames

Determines the optimal shift amplitude by comparing two successive lines of the image.

Namespace: Euresys.Open_eVision

```
[C#]
void MatchFrames(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int fixedRow,
 int minimumOffset,
 int maximumOffset,
 ref int bestOffset
 )
void MatchFrames(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 int fixedRow,
 int minimumOffset,
 int maximumOffset,
 ref int bestOffset
 )
void MatchFrames(
 Euresys.Open_eVision.EROIC24 sourceImage,
 int fixedRow,
 int minimumOffset,
 int maximumOffset,
 ref int bestOffset
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

fixedRow

Index of the line used for comparison. Line fixedRow remains in place and is compared with line (fixedRow + 1), shifted by some amount.

minimumOffset

Minimum value of the allowed offset (positive to the right).

maximumOffset

Maximum value of the allowed offset (positive to the right).

bestOffset

Estimated shift amplitude.

Remarks

These lines should be chosen such that they cross some edges or non-uniform areas.
When an image is interlaced, the two frames (even and odd lines) are not recorded at the same time. If there is movement in the scene, a visible artifact can result (the edges of objects exhibit a "comb" effect).
When the movement is uniform and horizontal (objects on a conveyor belt), one cure to this problem is to shift one of the frames horizontally with respect to the other frame (using EasyImage::RealignFrame). The amplitude of the shift can be estimated automatically.

EasyImage.Median

Applies a median filter to an image (median of the gray values in a neighborhood). Kernel may be of an arbitrary size except for EROIBW1 where it is always 3*3.

Namespace: Euresys.Open_eVision

[C#]

```
void Median(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void Median(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void Median(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void Median(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void Median(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void Median(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void Median(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half height of the kernel minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

EasyImage.ModulusImage

Prepares a lookup-table image for use for gradient magnitude computation.

Namespace: Euresys.Open_eVision

[C#]

```
void ModulusImage(
 Euresys.Open_eVision.EImageBW8 destinationImage,
 float gain
 )
```

Parameters

destinationImage

Pointer to the destination image.

gain

Gain value to be applied to the modulus. 1 saturates; 1/Sqrt(2) does not.

Remarks

The modulus of the gradient argument can be adjusted to avoid saturation. EasyImage::ModulusImage sets a lookup-table image for use with function EasyImage::GradientScalar, ready to compute the modulus of the gradient in the source image, i.e. its amplitude (as defined by the Euclidian norm). The argument will be returned as a value in range 0..255 suitable for storage in an EImageBW8 or as a value in range 0..65535 suitable for storage in an EImageBW16. A gain coefficient can be adjusted to avoid saturation (gain = 1 saturates gradient amplitudes larger than 255 in the EBW8 case and 65535 in the EBW16 case; gain = 1/Sqrt(2) never saturates).

EasyImage.MorphoGradientBox

Computes the morphological gradient of an image using a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void MorphoGradientBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void MorphoGradientBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void MorphoGradientBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void MorphoGradientBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void MorphoGradientBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void MorphoGradientBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void MorphoGradientBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

Remarks

The morphological gradient is the difference between the dilation and the erosion of the image, using the same structuring element.
The kernel size is a pair of odd numbers; they must be halved before they are passed. For instance, a 3x5 kernel is passed as 1x2.

EasyImage.MorphoGradientDisk

Computes the morphological gradient of an image using a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void MorphoGradientDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )

void MorphoGradientDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )

void MorphoGradientDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )

void MorphoGradientDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )

void MorphoGradientDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )

void MorphoGradientDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )

void MorphoGradientDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

region

Region to apply the function on.

Remarks

The morphological gradient is the difference between the dilation and the erosion of the image, using the same structuring element.

EasyImage.Normalize

Normalizes an image, i.e. applies a linear transform to the gray levels so that their average and standard deviation are imposed.

Namespace: Euresys.Open_eVision

```
[C#]
void Normalize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 float imposedAverage,
 float imposedStandardDeviation
 )
void Normalize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float imposedAverage,
 float imposedStandardDeviation
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

imposedAverage

Imposed average.

imposedStandardDeviation

Imposed standard deviation.

EasyImage.Offset

Transforms an image, applying a gain and offset to all pixels.

Namespace: Euresys.Open_eVision

```
[C#]
void Offset(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EColor Offset
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

Offset

Constant offset. By default (argument omitted) 0, i.e. no change.

Remarks

The gain should remain close to 1, and allows contrast adjustment of the image.

The offset can be positive or negative, and allows to adjust the image intensity. The resulting values are always saturated to range [0..255].

For color images, the separate gain and offset values are specified as triple of values stored in a EColor. The default values leave the image unchanged.

Internally, the computations are achieved through fixed-point arithmetic with 5 bits of precision for the fractional part. This can result in loss of precision with small gains.

EasyImage.OpenBox

Performs an opening on an image (erosion followed by dilation) on a rectangular kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void OpenBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

```
void OpenBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void OpenBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void OpenBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void OpenBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void OpenBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
void OpenBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half of the box width minus one, as shown on the picture below (by default, halfOfKernelWidth =1; 0 is allowed).

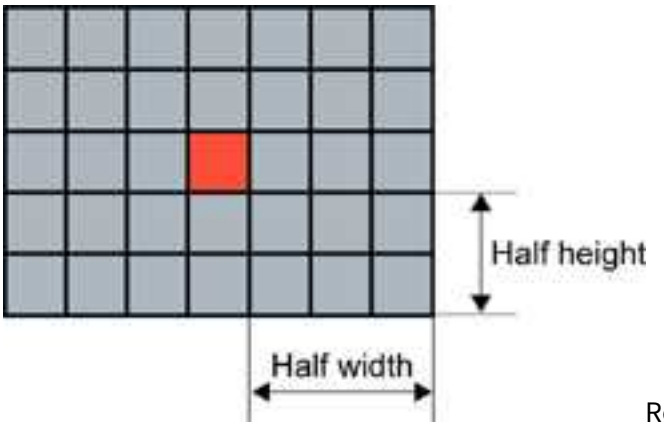
halfOfKernelHeight

Half of the box height minus one, as shown on the picture below (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

Remarks



Rectangular kernel of half width = 3 and half height = 2

EasyImage.OpenDisk

Performs an opening on an image (erosion followed by dilation) on a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void OpenDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
void OpenDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
```

```
void OpenDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void OpenDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
void OpenDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
void OpenDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void OpenDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. If NULL (default), this operation is destructive (i.e. applied to the source image).

halfOfKernelWidth

Half width of the kernel minus one, as shown on the picture below (by default, halfOfKernelWidth = 1; 0 is allowed).

region

Region to apply the function on.

EasyImage.Oper

Applies the desired arithmetic or logic pixel-wise operator between two images or constants.

Namespace: Euresys.Open_eVision

[C#]

```
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EBW8 constant,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EBW16 constant,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EC24 constant,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EBW8 constant,
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EBW16 constant,
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EC24 constant,
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 constant,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 constant,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

```
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24 constant,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW16 sourceImage0,
 Euresys.Open_eVision.EROIBW16 sourceImage1,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIC24 sourceImage0,
 Euresys.Open_eVision.EROIC24 sourceImage1,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

```
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW16 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.EROIC24 sourceImage1,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIC24 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EBW1 constant,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
void Oper(
 Euresys.Open_eVision.EArithmeticLogicOperation operation,
 Euresys.Open_eVision.EROIBW1 sourceImage0,
 Euresys.Open_eVision.EROIBW1 sourceImage1,
 Euresys.Open_eVision.EROIBW1 destinationImage
 )
```

Parameters

operation

Arithmetic or logic operator, as defined by EArithmeticLogicOperation.

constant

Gray-level or color constant.

destinationImage

Pointer to the destination image/ROI.

sourceImage

Pointer to the second source image/ROI (right operand).

sourceImage0

Pointer to the first source image/ROI (left operand).

sourceImage1

Pointer to the second source image/ROI (right operand).

Remarks

The source and destination images may be the same.
When the source operands are two color images/constants, the components are combined pair-wise. The result is a color image.
When the source operands are a color image and a gray-level image, each color component is combined with the gray-level component. The result is a color image.

EasyImage.Overlay

Overlays an image on the top of a color image, at a given position.

Namespace: Euresys.Open_eVision

[C#]

```
void Overlay(
 Euresys.Open_eVision.ERGBIC24 sourceImage,
 Euresys.Open_eVision.ERGBIC16 destinationImage,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 referenceValue
 )
void Overlay(
 Euresys.Open_eVision.ERGBIC24 sourceImage,
 Euresys.Open_eVision.ERGBIC15 destinationImage,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 referenceValue
 )
```

```
void Overlay(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 referenceValue
 )
void Overlay(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EROIC15 destinationImage,
 float panX,
 float panY
 )
void Overlay(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EROIC16 destinationImage,
 float panX,
 float panY
 )
void Overlay(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float panX,
 float panY
 )
void Overlay(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIC24 overlay,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 referenceValue
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

destinationImage
Pointer to the destination image/ROI.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY
Vertical panning value expressed in pixels. By default, no panning occurs.

referenceValue
Reference color.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

overlay

When a BW8 source image is specified, pointer to the overlay image/ROI.

Remarks

If a color image is provided as the source image, all the pixels of this image are copied to the destination image, but the ones that equal the reference color.
If a BW8 image is provided as the source image, all the pixels of the overlay image are copied to the destination image, but the ones that equal the reference color, the latter being replaced by the content of the source image.

EasyImage.OverlayColor

Gets/Sets the color of the overlay in the destination image when a BW8 Image is used as overlay source image in functions.

Namespace: Euresys.Open_eVision

[C#]

```
static Euresys.Open_eVision.EC24 OverlayColor
  { get; set; }
```

Remarks

Note. When a C24 Image is used as overlay source image, the color of the overlay in destination image is the same as the one in the overlay source image, thus allowing multi colored overlays.

EasyImage.PathToImage

Given a path described by coordinates in a path vector, copies the pixel values from the path vector to the corresponding image pixels.

Namespace: Euresys.Open_eVision

[C#]

```
void PathToImage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8PathVector path
 )
void PathToImage(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16PathVector path
 )
```

```
void PathToImage(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24PathVector path
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

path

Pointer to the destination vector.

EasyImage.PixelAverage

Computes the average pixel value in a gray-level or color image.

Namespace: Euresys.Open_eVision

[C#]

```
void PixelAverage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float average
 )

void PixelAverage(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float average
 )

void PixelAverage(
 Euresys.Open_eVision.EROIC24 sourceImage,
 out float average0,
 out float average1,
 out float average2
 )

void PixelAverage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float average
 )

void PixelAverage(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float average
 )
```

```
void PixelAverage(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float average0,
 out float average1,
 out float average2
 )
void PixelAverage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 out float average
 )
void PixelAverage(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 out float average
 )
void PixelAverage(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 out float average0,
 out float average1,
 out float average2
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

average
Reference to the average gray-level value.

average0
Reference to the average values for the first color channel.

average1
Reference to the average values for the second color channel.

average2
Reference to the average values for the third color channel.

region
Pointer to a region to apply the function only on a particular region in the image.

inputMask
Pointer to the mask, which allows functions to be applied on a particular region in the image.

EasyImage.PixelCompare

Counts the number of pixels differing between two images.

Namespace: Euresys.Open_eVision

[C#]

```
uint PixelCompare(
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIBW16 sourceImage0,
 Euresys.Open_eVision.EROIBW16 sourceImage1
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIC24 sourceImage0,
 Euresys.Open_eVision.EROIC24 sourceImage1
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 sourceImage1
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIBW16 sourceImage0,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 sourceImage1
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIC24 sourceImage0,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 sourceImage1
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIBW8 sourceImage0,
 Euresys.Open_eVision.EROIBW8 sourceImage1,
 Euresys.Open_eVision.EROIBW8 mask
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIBW16 sourceImage0,
 Euresys.Open_eVision.EROIBW16 sourceImage1,
 Euresys.Open_eVision.EROIBW8 mask
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIC24 sourceImage0,
 Euresys.Open_eVision.EROIC24 sourceImage1,
 Euresys.Open_eVision.EROIBW8 mask
 )

uint PixelCompare(
 Euresys.Open_eVision.EROIBW1 sourceImage0,
 Euresys.Open_eVision.EROIBW1 sourceImage1
 )
```

Parameters

sourceImage0

Pointer to the first source image/ROI.

sourceImage1

Pointer to the second source image/ROI.

region

Pointer to a region to apply the function only on a particular region in the image.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.PixelCount

Counts the pixels in the three value classes separated by two thresholds.

Namespace: Euresys.Open_eVision

[C#]

```
void PixelCount(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out int numberOfPixelsBelowThreshold,
 out int numberOfPixelsBetweenThresholds,
 out int numberOfPixelsAboveThreshold
 )
void PixelCount(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out int numberOfPixelsBelowThreshold,
 out int numberOfPixelsBetweenThresholds,
 out int numberOfPixelsAboveThreshold
 )
void PixelCount(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out int numberOfPixelsBelowThreshold,
 out int numberOfPixelsBetweenThresholds,
 out int numberOfPixelsAboveThreshold
 )
```

```
void PixelCount(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out int numberOfPixelsBelowThreshold,
 out int numberOfPixelsBetweenThresholds,
 out int numberOfPixelsAboveThreshold
 )

void PixelCount(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out System.UInt64 numberOfPixelsBelowThreshold,
 out System.UInt64 numberOfPixelsBetweenThresholds,
 out System.UInt64 numberOfPixelsAboveThreshold
 )

void PixelCount(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out System.UInt64 numberOfPixelsBelowThreshold,
 out System.UInt64 numberOfPixelsBetweenThresholds,
 out System.UInt64 numberOfPixelsAboveThreshold
 )

void PixelCount(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out System.UInt64 numberOfPixelsBelowThreshold,
 out System.UInt64 numberOfPixelsBetweenThresholds,
 out System.UInt64 numberOfPixelsAboveThreshold
 )

void PixelCount(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out System.UInt64 numberOfPixelsBelowThreshold,
 out System.UInt64 numberOfPixelsBetweenThresholds,
 out System.UInt64 numberOfPixelsAboveThreshold
 )
```

```
void PixelCount(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out int numberOfPixelsBelowThreshold,
 out int numberOfPixelsBetweenThresholds,
 out int numberOfPixelsAboveThreshold
 )
void PixelCount(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out int numberOfPixelsBelowThreshold,
 out int numberOfPixelsBetweenThresholds,
 out int numberOfPixelsAboveThreshold
 )
void PixelCount(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8 lowThreshold,
 Euresys.Open_eVision.EBW8 highThreshold,
 out System.UInt64 numberOfPixelsBelowThreshold,
 out System.UInt64 numberOfPixelsBetweenThresholds,
 out System.UInt64 numberOfPixelsAboveThreshold
 )
void PixelCount(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16 lowThreshold,
 Euresys.Open_eVision.EBW16 highThreshold,
 out System.UInt64 numberOfPixelsBelowThreshold,
 out System.UInt64 numberOfPixelsBetweenThresholds,
 out System.UInt64 numberOfPixelsAboveThreshold
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

lowThreshold

Inferior threshold.

highThreshold

Superior threshold.

numberOfPixelsBelowThreshold

Reference to the count of pixels strictly below the inferior threshold.

numberOfPixelsBetweenThresholds

Reference to the count of pixels above or equal to the inferior threshold, and strictly below the superior threshold.

numberOfPixelsAboveThreshold

Reference to the count of pixels above or equal to the superior threshold.

region

Pointer to a region to apply the function only on a particular region in the image.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.PixelMax

Computes the maximum gray-level value in an image.

Namespace: Euresys.Open_eVision

[C#]

```
void PixelMax(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out Euresys.Open_eVision.EBW8 maximumValue
 )

void PixelMax(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out Euresys.Open_eVision.EBW16 maximumValue
 )

void PixelMax(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out Euresys.Open_eVision.EBW8 maximumValue
 )

void PixelMax(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out Euresys.Open_eVision.EBW16 maximumValue
 )

void PixelMax(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out Euresys.Open_eVision.EBW8 maximumValue
 )

void PixelMax(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out Euresys.Open_eVision.EBW16 maximumValue
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumValue

Reference to the maximum value.

region

Pointer to a region to apply the function only on a particular region in the image.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.PixelMaxBW16

Computes the maximum gray-level value in an image.

Namespace: Euresys.Open_eVision

```
[C#]
void PixelMaxBW16(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out Euresys.Open_eVision.EBW16 maximumValue
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumValue

Reference to the maximum value.

EasyImage.PixelMaxBW8

Computes the maximum gray-level value in an image.

Namespace: Euresys.Open_eVision

```
[C#]
void PixelMaxBW8(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out Euresys.Open_eVision.EBW8 maximumValue
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumValue

Reference to the maximum value.

EasyImage.PixelMin

Computes the minimum gray-level value in an image.

Namespace: Euresys.Open_eVision

```
[C#]
void PixelMin(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out Euresys.Open_eVision.EBW8 minimumValue
 )
void PixelMin(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out Euresys.Open_eVision.EBW16 minimumValue
 )
void PixelMin(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out Euresys.Open_eVision.EBW8 minimumValue
 )
void PixelMin(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out Euresys.Open_eVision.EBW16 minimumValue
 )
void PixelMin(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out Euresys.Open_eVision.EBW8 minimumValue
 )
void PixelMin(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out Euresys.Open_eVision.EBW16 minimumValue
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

minimumValue

Reference to the minimum value.

region

Region to apply the function on.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.PixelMinBW16

Computes the minimum gray-level value in an image.

Namespace: Euresys.Open_eVision

```
[C#]
void PixelMinBW16(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out Euresys.Open_eVision.EBW16 minimumValue
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

minimumValue

Reference to the minimum value.

EasyImage.PixelMinBW8

Computes the minimum gray-level value in an image.

Namespace: Euresys.Open_eVision

```
[C#]
void PixelMinBW8(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out Euresys.Open_eVision.EBW8 minimumValue
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

minimumValue

Reference to the minimum value.

EasyImage.PixelStat

Computes the minimum, maximum and average gray-level values in an image.

Namespace: Euresys.Open_eVision

[C#]

```
void PixelStat(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void PixelStat(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )

void PixelStat(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void PixelStat(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )

void PixelStat(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void PixelStat(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

minimumValue
Reference to the minimum value.

maximumValue
Reference to the maximum value.

average
Reference to the average value.

region
Pointer to a region to apply the function only on a particular region in the image.

mask
Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.PixelStatBW16

Computes the minimum, maximum and average gray-level values in an image.

Namespace: Euresys.Open_eVision

[C#]

```
void PixelStatBW16(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

minimumValue
Reference to the minimum value.

maximumValue
Reference to the maximum value.

average
Reference to the average value.

EasyImage.PixelStatBW8

Computes the minimum, maximum and average gray-level values in an image.

Namespace: Euresys.Open_eVision

```
[C#]
void PixelStatBW8(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

minimumValue
Reference to the minimum value.

maximumValue
Reference to the maximum value.

average
Reference to the average value.

EasyImage.PixelStdDev

Computes the average gray-level or color value in an image, the standard deviation of the color components, and the correlation between the color components (in the case of color images).

Namespace: Euresys.Open_eVision

```
[C#]
void PixelStdDev(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float standardDeviation,
 out float mean
 )
void PixelStdDev(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float standardDeviation,
 out float mean
 )
```

```
void PixelStdDev(
 Euresys.Open_eVision.EROIC24 sourceImage,
 out float standardDeviation0,
 out float standardDeviation1,
 out float standardDeviation2,
 out float correlation01,
 out float correlation12,
 ref float correlation20,
 out float mean0,
 out float mean1,
 out float mean2
 )

void PixelStdDev(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float standardDeviation,
 out float mean
 )

void PixelStdDev(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float standardDeviation,
 out float mean
 )

void PixelStdDev(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float standardDeviation0,
 out float standardDeviation1,
 out float standardDeviation2,
 out float correlation01,
 out float correlation12,
 ref float correlation20,
 out float mean0,
 out float mean1,
 out float mean2
 )

void PixelStdDev(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float standardDeviation,
 out float mean
 )

void PixelStdDev(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float standardDeviation,
 out float mean
 )
```

```
void PixelStdDev(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float standardDeviation0,
 out float standardDeviation1,
 out float standardDeviation2,
 out float correlation01,
 out float correlation12,
 ref float correlation20,
 out float mean0,
 out float mean1,
 out float mean2
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

standardDeviation

Reference to a variable in which the standard deviation of the pixel values is to be stored (for gray-level images).

mean

Reference to a variable in which the average value of the pixels is to be stored (for gray-level images).

standardDeviation0

Reference to a variable in which the standard deviation of the values of the first color component is to be stored (for color images).

standardDeviation1

Reference to a variable in which the standard deviation of the values of the second color component is to be stored (for color images).

standardDeviation2

Reference to a variable in which the standard deviation of the values of the third color component is to be stored (for color images).

correlation01

Reference to a variable in which the correlation between the values of the first color component and the second color component is to be stored (for color images).

correlation12

Reference to a variable in which the correlation between the values of the second color component and the third color component is to be stored (for color images).

correlation20

-

mean0

Reference to a variable in which the average value of the first color component is to be stored (for color images).

mean1

Reference to a variable in which the average value of the second color component is to be stored (for color images).

mean2

Reference to a variable in which the average value of the third color component is to be stored (for color images).

region

Pointer to a region to apply the function only on a particular region in the image.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

Remarks

The variance can be obtained from the standard deviation by squaring it.

EasyImage.PixelVariance

For a gray-level image, computes the mean and variance of the pixel values.

Namespace: Euresys.Open_eVision

[C#]

```
void PixelVariance(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float variance,
 out float mean
 )

void PixelVariance(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float variance,
 out float mean
 )

void PixelVariance(
 Euresys.Open_eVision.EROIC24 sourceImage,
 out float variance0,
 out float variance1,
 out float variance2,
 out float covariance01,
 out float covariance12,
 out float covariance20,
 out float mean0,
 out float mean1,
 out float mean2
 )

void PixelVariance(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float variance,
 out float mean
 )
```

```
void PixelVariance(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float variance,
 out float mean
 )

void PixelVariance(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float variance0,
 out float variance1,
 out float variance2,
 out float covariance01,
 out float covariance12,
 out float covariance20,
 out float mean0,
 out float mean1,
 out float mean2
 )

void PixelVariance(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float variance,
 out float mean
 )

void PixelVariance(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float variance,
 out float mean
 )

void PixelVariance(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float variance0,
 out float variance1,
 out float variance2,
 out float covariance01,
 out float covariance12,
 out float covariance20,
 out float mean0,
 out float mean1,
 out float mean2
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

variance
Reference to the covariances of the pairs of pixel component values.

mean
Reference to the mean pixel component values.

variance0
Reference to the covariances of the pairs of pixel component values.

variance1
Reference to the covariances of the pairs of pixel component values.

variance2
Reference to the covariances of the pairs of pixel component values.

covariance01
Reference to the covariances of the pairs of pixel component values.

covariance12
Reference to the covariances of the pairs of pixel component values.

covariance20
Reference to the covariances of the pairs of pixel component values.

mean0
Reference to the mean pixel component values.

mean1
Reference to the mean pixel component values.

mean2
Reference to the mean pixel component values.

region
Pointer to a region to apply the function only on a particular region in the image.

mask
Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

Remarks

For a color image, computes the means of the three pixel color components, the variances of the components and the covariances between pairs of components.

EasyImage.ProfileDerivative

Computes the first derivative of a profile extracted from a gray-level image.

Namespace: Euresys.Open_eVision

[C#]

```
void ProfileDerivative(
 Euresys.Open_eVision.EBW8Vector sourceVector,
 Euresys.Open_eVision.EBW8Vector destinationVector
 )
void ProfileDerivative(
 Euresys.Open_eVision.EBW16Vector sourceVector,
 Euresys.Open_eVision.EBW16Vector destinationVector
 )
```

Parameters

sourceVector

Pointer to the source vector.

destinationVector

Pointer to the destination vector.

Remarks

Taking the derivative transforms transitions (edges) into peaks.

Note. Since the EBW8 data type only handles unsigned values, the derivative is shifted up by 128. Values under [above] 128 correspond to negative [positive] derivative (decreasing [increasing] slope).

EasyImage.ProjectOnAColumn

Projects an image horizontally onto a column.

Namespace: Euresys.Open_eVision

[C#]

```
void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )
void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )
void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8Vector destinationVector
 )
void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16Vector destinationVector
 )
```

```
void ProjectOnAColumn(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector destinationVector
 )

void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )

void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )

void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8Vector destinationVector
 )

void ProjectOnAColumn(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16Vector destinationVector
 )

void ProjectOnAColumn(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EC24Vector destinationVector
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationVector

Pointer to the destination vector.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

Remarks

Pixel gray/color levels are added when projecting into an EBW32Vector. When projecting into an EBW8Vector/EBW16Vector/EC24Vector, pixel values are averaged, instead.

EasyImage.ProjectOnARow

Projects an image vertically onto a row.

Namespace: Euresys.Open_eVision

[C#]

```
void ProjectOnARow(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW32Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW8Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EBW16Vector destinationVector
 )

void ProjectOnARow(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EC24Vector destinationVector
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationVector

Pointer to the destination vector.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

Remarks

Pixel gray/color levels are added when projecting into an EBW32Vector. When projecting into an EBW8Vector/EBW16Vector/EC24Vector, pixel values are averaged, instead.

EasyImage.RealignFrame

Shifts one frame of the image horizontally.

Namespace: Euresys.Open_eVision

[C#]

```
void RealignFrame(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 int offset,
 uint fixedRow
 )

void RealignFrame(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 int offset,
 uint fixedRow
 )

void RealignFrame(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 int offset,
 uint fixedRow
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

offset

Indicates the number of pixels by which to shift (positive to the right).

fixedRow

Specifies which frame remains unchanged (the frame made up of all lines of the same parity as fixedRow; by default, fixedRow = 0).

Remarks

The same image should be used as source and destination. If the destination image differs from the source image, only the shifted rows are copied. To use a different destination image, the source image must be copied first in the destination image object.
When an image is interlaced, the two frames (even and odd lines) are not recorded at the same time. If there is movement in the scene, a visible artifact can result (the edges of objects exhibit a "comb" effect).
When the movement is uniform and horizontal (objects on a conveyor belt), one cure to this problem is to shift one of the frames horizontally with respect to the other frame. The amplitude of the shift can be estimated automatically (using EasyImage::MatchFrames).

EasyImage.RebuildFrame

Rebuilds one frame of the image by interpolation between the lines of the other frame.

Namespace: Euresys.Open_eVision

[C#]

```
void RebuildFrame(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint fixedRow
 )

void RebuildFrame(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint fixedRow
 )

void RebuildFrame(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint fixedRow
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

fixedRow

Specifies which frame remains unchanged (the frame made up of all lines of the same parity as fixedRow; by default, fixedRow = 0).

Remarks

The same image should be used as source and destination. If the destination image differs from the source image, only the shifted rows are copied. To use a different destination image, the source image must be copied first in the destination image object. When an image is interlaced, the two frames (even and odd lines) are not recorded at the same time. If there is movement in the scene, a visible artifact can result (the edges of objects exhibit a "comb" effect). One cure to this problem is to replace one of the frames by linearly interpolating between the lines of the other frame.

EasyImage.RecursiveAverage

Applies stronger noise reduction to small variations and conversely.

Namespace: Euresys.Open_eVision

[C#]

```
void RecursiveAverage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW16 store,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EBW16Vector lookupTable
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

store

Pointer to a 16-bit work image.

destinationImage

Pointer to the destination image/ROI.

lookupTable

Pointer to the LUT vector generated by a call to EasyImage::SetRecursiveAverageLUT.

Remarks

Recursive averaging is a well known process for noise reduction by temporal integration. The principle is to continuously update a noise-free image by blending it, using a linear combination, with the raw, noisy, live image stream.
Algorithmically, this amounts to apply the following recurrence: where a is a mixture coefficient. The value of this coefficient can be adjusted so that a prescribed noise reduction ratio is achieved. This procedure is effective when applied to still images, but generates a trailing effect on moving objects because of the transient behavior of the filter. The larger the noise reduction ratio, the heavier the trailing effect. To work around this, a non-linearity can be introduced in the blending process: small gray-level values variations between successive images are usually caused by noise, while large variations correspond to changes in the signal itself (camera displacement or object movements). Function EasyImage::RecursiveAverage uses this observation and applies stronger noise reduction to small variations and conversely. This way, noise is better reduced in still areas and trailing is avoided in moving areas.
For optimal performance, the non-linearity must be pre-computed once for all using function EasyImage::SetRecursiveAverageLUT.

Note. Before the first call to the EasyImage::RecursiveAverage method, the 16-bit work image *must* be cleared (all pixel values set to zero).

EasyImage.Register

Registers an image by realigning one, two or three pivot points to reference positions.

Namespace: Euresys.Open_eVision

[C#]

```
void Register(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 int interpolationBits
 )
```

```
void Register(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 int interpolationBits
 )
void Register(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 int interpolationBits
 )
void Register(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float sourceImagePivot1X,
 float sourceImagePivot1Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 float destinationImagePivot1X,
 float destinationImagePivot1Y,
 int interpolationBits,
 bool resize
 )
void Register(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float sourceImagePivot1X,
 float sourceImagePivot1Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 float destinationImagePivot1X,
 float destinationImagePivot1Y,
 int interpolationBits,
 bool resize
 )
```

```
void Register(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float sourceImagePivot1X,
 float sourceImagePivot1Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 float destinationImagePivot1X,
 float destinationImagePivot1Y,
 int interpolationBits,
 bool resize
 )
void Register(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float sourceImagePivot1X,
 float sourceImagePivot1Y,
 float sourceImagePivot2X,
 float sourceImagePivot2Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 float destinationImagePivot1X,
 float destinationImagePivot1Y,
 float destinationImagePivot2X,
 float destinationImagePivot2Y,
 int interpolationBits
 )
void Register(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float sourceImagePivot1X,
 float sourceImagePivot1Y,
 float sourceImagePivot2X,
 float sourceImagePivot2Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 float destinationImagePivot1X,
 float destinationImagePivot1Y,
 float destinationImagePivot2X,
 float destinationImagePivot2Y,
 int interpolationBits
 )
```

```
void Register(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 float sourceImagePivot0X,
 float sourceImagePivot0Y,
 float sourceImagePivot1X,
 float sourceImagePivot1Y,
 float sourceImagePivot2X,
 float sourceImagePivot2Y,
 float destinationImagePivot0X,
 float destinationImagePivot0Y,
 float destinationImagePivot1X,
 float destinationImagePivot1Y,
 float destinationImagePivot2X,
 float destinationImagePivot2Y,
 int interpolationBits
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. May not be the same as the source image.

sourceImagePivot0X

First pivot point abscissa in the source image.

sourceImagePivot0Y

First pivot point ordinate in the source image.

destinationImagePivot0X

First pivot point abscissa in the destination image.

destinationImagePivot0Y

First pivot point ordinate in the destination image.

interpolationBits

Number of bits of accuracy for interpolation. Allowed values are 0 (no interpolation, nearest neighbor), 4 (linear interpolation) or 8 (cubic interpolation).

sourceImagePivot1X

Second pivot point abscissa in the source image.

sourceImagePivot1Y

Second pivot point ordinate in the source image.

destinationImagePivot1X

Second pivot point abscissa in the destination image.

destinationImagePivot1Y

Second pivot point ordinate in the destination image.

resize

true if scaling is allowed.

sourceImagePivot2X

Third pivot point abscissa in the source image.

sourceImagePivot2Y

Third pivot point ordinate in the source image.

destinationImagePivot2X

Third pivot point abscissa in the destination image.

destinationImagePivot2Y

Third pivot point ordinate in the destination image.

Remarks

Out-of-image-bounds pixels are black.
Registration is the process of realigning two misaligned images so that point-to-point comparisons are possible. The simplest way to achieve this is to accurately locate features in both images (landmarks or pivots), using pattern matching, point measurement or whatever other technique, and realign one of the images so that the landmarks are superimposed.
* When a single pivot point is used, the registration transform is a simple translation. If interpolation bits are used, sub-pixel translation is achieved.
* When two pivot points are used, the registration is a combination of translation, rotation and optionally scaling. If scaling is not allowed, the second pivot point will not be matched exactly in general. Anyway, for most applications scaling should not be used unless it corresponds to a change of lens magnification or viewing distance.
* When three pivot points are used, the registration is a combination of translation, rotation, shearing correction and optionally scaling. The so-called shear effect can arise when acquiring images with a misaligned line-scan camera.
To achieve good accuracy, the pivot points should be chosen as far apart as possible.

EasyImage.RmsNoise

Computes the root-mean-square amplitude of noise, by comparing a given image to a reference image.

Namespace: Euresys.Open_eVision

[C#]

```
float RmsNoise(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 referenceImage,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
float RmsNoise(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 referenceImage,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
float RmsNoise(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 referenceImage,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
```

```
float RmsNoise(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 referenceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
float RmsNoise(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 referenceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
float RmsNoise(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 referenceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

referenceImage

Pointer to the reference image/ROI.

referenceNoise

Specifies how the reference image is affected by noise, as defined by EReferenceNoise.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

count

-

Remarks

The reference image can be noiseless (obtained by suppressing the source of noise), or affected by a noise of the same distribution as the given image.

EasyImage.Rotate

Rotate an image by an increment of a quarter of a turn (right angle).

Namespace: Euresys.Open_eVision

[C#]

```
void Rotate(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.ERotationRightAngles rightAngle
 )
```

```
void Rotate(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.ERotationRightAngles rightAngle
 )
void Rotate(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.ERotationRightAngles rightAngle
 )
void Rotate(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERotationRightAngles rightAngle
 )
void Rotate(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERotationRightAngles rightAngle
 )
void Rotate(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERotationRightAngles rightAngle
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. May not be the same as the source image.

rightAngle

Right angle of rotation (90, 180 or 270 degrees).

Remarks

Destination image/roi size should be the compatible with the source image/roi size with the rotation.

EasyImage.ScaleRotate

Re-scales an image by an arbitrary factor and/or rotates it by an arbitrary angle.

Namespace: Euresys.Open_eVision

[C#]

```
void ScaleRotate(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 float sourceImagePivotX,
 float sourceImagePivotY,
 float destinationImagePivotX,
 float destinationImagePivotY,
 float scaleX,
 float scaleY,
 float rotation,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 int interpolationBits
 )
void ScaleRotate(
 Euresys.Open_eVision.EROIC24 sourceImage,
 float sourceImagePivotX,
 float sourceImagePivotY,
 float destinationImagePivotX,
 float destinationImagePivotY,
 float scaleX,
 float scaleY,
 float rotation,
 Euresys.Open_eVision.EROIC24 destinationImage,
 int interpolationBits
 )
void ScaleRotate(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 float sourceImagePivotX,
 float sourceImagePivotY,
 float destinationImagePivotX,
 float destinationImagePivotY,
 float scaleX,
 float scaleY,
 float rotation,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 int interpolationBits
 )
void ScaleRotate(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 float sourceImagePivotX,
 float sourceImagePivotY,
 float destinationImagePivotX,
 float destinationImagePivotY,
 float scaleX,
 float scaleY,
 float rotation,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 int interpolationBits
 )
```

```
void ScaleRotate(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 float sourceImagePivotX,
 float sourceImagePivotY,
 float destinationImagePivotX,
 float destinationImagePivotY,
 float scaleX,
 float scaleY,
 float rotation,
 Euresys.Open_eVision.EROIC24 destinationImage,
 int interpolationBits
 )
void ScaleRotate(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 float sourceImagePivotX,
 float sourceImagePivotY,
 float destinationImagePivotX,
 float destinationImagePivotY,
 float scaleX,
 float scaleY,
 float rotation,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 int interpolationBits
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

sourceImagePivotX
Pivot point abscissa in the source image.

sourceImagePivotY
Pivot point ordinate in the source image.

destinationImagePivotX
Pivot point abscissa in the destination image.

destinationImagePivotY
Pivot point ordinate in the destination image.

scaleX
Scale factor for the abscissas. Its value must be different than 0.0.

scaleY
Scale factor for the ordinates. Its value must be different than 0.0.

rotation
Anti-clockwise rotation angle, using the current angle unit.

destinationImage
Pointer to the destination image/ROI. May not be the same as the source image.

interpolationBits

Number of bits of accuracy for interpolation. Allowed values are 0 (no interpolation, nearest neighbor), 4 (linear interpolation) or 8 (cubic interpolation).

region

Region to apply the function on.

Remarks

For resampling, the nearest neighbor rule or bilinear interpolation with 4 or 8 bits of accuracy is used.
The pivot point is a given point in the source image which is mapped to a given point in the destination image. Rotation and scaling are done around the pivot point. The pivot point reference coordinates are based on the 'Pixel Coordinate System', meaning that the origin (0, 0) is the center of the top left pixel of the image.
Out-of-image-bounds pixels are black.
When using a region, only the pixels contained in this region will be taken into account.

EasyImage.SetCircleWarp

Prepares suitable warp images for use with function EasyImage::Warp to unwarp a circular ring-wedge shape into a straight rectangle. This is a cartesian to polar image conversion function.
See also EasyImage::SetInvCircleWarp.

Namespace: Euresys.Open_eVision

[C#]

```
void SetCircleWarp(
 float centerX,
 float centerY,
 int numberOfRadialSampledPoints,
 float minimumRadius,
 float maximumRadius,
 int numberOfTangentSampledPoints,
 float minimumAngle,
 float maximumAngle,
 Euresys.Open_eVision.EImageBW16 warpImageX,
 Euresys.Open_eVision.EImageBW16 warpImageY
 )
```

Parameters

centerX

Abscissa of the ring-wedge center.

centerY

Ordinate of the ring-wedge center.

numberOfRadialSampledPoints

Number of points to be sampled in the radial direction (the height of the destination polar image).

minimumRadius

Starting radius of the ring-wedge shape.

maximumRadius

Ending radius of the ring-wedge shape.

numberOfTangentSampledPoints

Number of points to be sampled in the tangent direction (the width of the destination polar image).

minimumAngle

Starting angle of the ring-wedge shape.

maximumAngle

Ending angle of the ring-wedge shape.

warpImageX

Destination warp image for the abscissas.

warpImageY

Destination warp image for the ordinates.

Remarks

Typical use is unwarping of a text printed around a circle.

Note. A ring-wedge is delimited by two concentric circles and two straight lines passing through the center.

EasyImage.SetFrame

Replaces the frame of given parity in an image.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFrame(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool odd
 )
```

```
void SetFrame(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 bool odd
 )
void SetFrame(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool odd
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

odd

Specifies which frame is replaced (the frame made up of all lines of the same parity as odd).

Remarks

The size of the destination image is determined as follows: DstImage_Width = SrcImage_ WidthDstImage_Height = (SrcImage_Height + 1 - odd) / 2

EasyImage.SetInvCircleWarp

Prepares suitable warp images for use with function EasyImage::Warp to unwarp a straight rectangle into a circular ring-wedge shape. This is a polar to cartesian image conversion function.
See also EasyImage::SetCircleWarp.

Namespace: Euresys.Open_eVision

[C#]

```
void SetInvCircleWarp(
 float centerX,
 float centerY,
 int numberOfRadialSampledPoints,
 float minimumRadius,
 float maximumRadius,
 int numberOfTangentSampledPoints,
 float minimumAngle,
 float maximumAngle,
 Euresys.Open_eVision.EImageBW16 warpImageX,
 Euresys.Open_eVision.EImageBW16 warpImageY,
 int warpImageWidth,
 int warpImageHeight
 )
```

Parameters

centerX

Abscissa of the ring-wedge center.

centerY

Ordinate of the ring-wedge center.

numberOfRadialSampledPoints

Number of points to be sampled in the radial direction (the height of the source polar image).

minimumRadius

Starting radius of the ring-wedge shape.

maximumRadius

Ending radius of the ring-wedge shape.

numberOfTangentSampledPoints

Number of points to be sampled in the tangent direction (the width of the source polar image).

minimumAngle

Starting angle of the ring-wedge shape.

maximumAngle

Ending angle of the ring-wedge shape.

warpImageX

Destination cartesian image for the abscissas.

warpImageY

Destination cartesian image for the ordinates.

warpImageWidth

The width of the destination cartesian images. Optional parameter, if omitted a best fit size is calculated.

warpImageHeight

The height of the destination cartesian images. Optional parameter, if omitted a best fit size is calculated.

EasyImage.SetRecursiveAverageLUT

Pre-compute the required non-linear transfer function for noise reduction by recursive temporal averaging.

Namespace: Euresys.Open_eVision

[C#]

```
void SetRecursiveAverageLUT(
 Euresys.Open_eVision.EBW16Vector lookupTable,
 float reductionNoiseFactor,
 float reductionNoiseWidth
 )
```

Parameters

lookupTable

Pointer to the LUT vector holding the non-linear transfer function.

reductionNoiseFactor

Noise reduction factor. The larger the value, the more effectively noise will be reduced.

reductionNoiseWidth

Indicates the extent to which noise reduction applies to large variations in gray-level values. For variations small with respect to this parameter, noise will be reduced by a factor close to the reductionNoiseFactor value; for variations much larger than reductionNoiseWidth, no noise reduction will take place.

Remarks

This function is a companion to EasyImage::RecursiveAverage.

EasyImage.SetupEqualize

Prepares a lookup-table for image equalization, using an image histogram.

Namespace: Euresys.Open_eVision

[C#]

```
void SetupEqualize(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 Euresys.Open_eVision.EBW8Vector lookupTable
 )
```

Parameters

histogram

Pointer to the source histogram vector.

lookupTable

Pointer to the destination lookup-table vector.

Remarks

This function, along with EasyImage::Histogram and EasyImage::Lut, is an alternative to using EasyImage::Equalize.

EasyImage.SetupInverseWarp

Prepares suitable inverse warp images for use with function EasyImage::Warp to unwarp an invertible LUT given by the warpImageX and warpImageY.

Namespace: Euresys.Open_eVision

```
[C#]
void SetupInverseWarp(
 Euresys.Open_eVision.EImageBW16 warpImageX,
 Euresys.Open_eVision.EImageBW16 warpImageY,
 Euresys.Open_eVision.EImageBW16 inverseWarpImageX,
 Euresys.Open_eVision.EImageBW16 inverseWarpImageY
 )
```

Parameters

warpImageX

Pointer to the X lookup image.

warpImageY

Pointer to the Y lookup image.

inverseWarpImageX

Pointer to the inverse X lookup image.

inverseWarpImageY

Pointer to the inverse Y lookup image.

Remarks

Typical use is warping back a text printed around a circle. The behavior when using non invertible LUT is undefined.

EasyImage.Shrink

Resizes an image to a smaller size. Pre-filtering is applied to avoid aliasing.

Namespace: Euresys.Open_eVision

```
[C#]
void Shrink(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void Shrink(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
void Shrink(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

EasyImage.SignalNoiseRatio

Computes the signal to noise ratio, in dB, by comparing a given image to a reference image.

Namespace: Euresys.Open_eVision

[C#]

```
float SignalNoiseRatio(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 referenceImage,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )

float SignalNoiseRatio(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 referenceImage,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )

float SignalNoiseRatio(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 referenceImage,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )

float SignalNoiseRatio(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 referenceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )

float SignalNoiseRatio(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 referenceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )

float SignalNoiseRatio(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 referenceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 Euresys.Open_eVision.EReferenceNoise referenceNoise
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

referenceImage

Pointer to the reference image/ROI.

referenceNoise

Specifies how the reference image is affected by noise, as defined by EReferenceNoise.

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

pSrcImage

-

pRefImage

-

un32Count

-

eReferenceNoise

-

Remarks

The reference image can be noiseless (obtained by suppressing the source of noise) or be affected by a noise of the same distribution as the given image.
The signal amplitude is defined as the sum of the squared pixel gray-level values while the noise amplitude is defined as the sum of the squared difference between the pixel gray-level values of the given image and the reference.

EasyImage.SwapFrames

Interchanges the even and odd rows of an image.

Namespace: Euresys.Open_eVision

[C#]

```
void SwapFrames(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void SwapFrames(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void SwapFrames(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

Remarks

This is helpful when acquisition of an interleaved image has confused even and odd frames.

EasyImage.Thick

Applies a thickening operation on an image, using a 3x3 kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void Thick(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel thickeningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
void Thick(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EKernel thickeningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
void Thick(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EKernel thickeningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
int Thick(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 Euresys.Open_eVision.EKernel thickeningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

thickeningKernel

Pointer to the thickening kernel.

rotationMode

Rotation mode, as defined by EKernelRotation.

numberOfIterations

Number of iterations to apply. 0 indicates stop when convergence is reached. Upon return, gives the number of passes actually performed. If the rotation mode is set to either Clockwise or Anticlockwise, a pass comprises eight kernel rotations.

Remarks

The thickening kernel coefficients must be 0 (matching black pixel, value 0), 1 (matching non black pixel, value > 0) or -1 (don't care). When a match is found between the kernel coefficients and the neighborhood of a pixel, the pixel value is set to 255.

EasyImage.Thin

Applies a thinning operation on an image, using a 3x3 kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void Thin(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EKernel thinningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
void Thin(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 Euresys.Open_eVision.EKernel thinningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
void Thin(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EKernel thinningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
```

```
int Thin(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 Euresys.Open_eVision.EKernel thinningKernel,
 Euresys.Open_eVision.EKernelRotation rotationMode,
 ref int numberOfIterations
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as source image.

thinningKernel

Pointer to the thinning kernel.

rotationMode

Rotation mode, as defined by EKernelRotation.

numberOfIterations

Number of iterations to apply. 0 indicates stop when convergence is reached. Upon return, gives the number of passes actually performed. If the rotation mode is set to either Clockwise or Anticlockwise, a pass comprises eight kernel rotations.

Remarks

The thinning kernel coefficients must be 0 (matching black pixel, value 0), 1 (matching non black pixel, value > 0) or -1 (don't care). When a match is found between the kernel coefficients and the neighborhood of a pixel, the pixel value is set to 0.

EasyImage.ThreeLevelsMinResidueThreshold

Computes the two threshold values used to separate the pixels of an image in three classes.

Namespace: Euresys.Open_eVision

[C#]

```
float ThreeLevelsMinResidueThreshold(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 out Euresys.Open_eVision.EBW8 firstGrayPixelValue,
 out Euresys.Open_eVision.EBW8 firstWhitePixelValue,
 out float averageBlack,
 out float averageGray,
 out float averageWhite
 )
```

Parameters

histogram
Histogram of the image.

firstGrayPixelValue
Low threshold.

firstWhitePixelValue
High threshold.

averageBlack
Average value of the black pixels (pixels under the low threshold).

averageGray
Average value of the gray pixels (pixels between the low threshold and the high threshold).

averageWhite
Average value of the white pixels (pixels over the high threshold).

Remarks

These values are computed using the minimum residue criterion from the histogram of the image. The function returns the minimum residue as per the method. The residue is the Euclidian distance between the source image and the thresholded image.

EasyImage.Threshold

Binarize an image by setting pixels to two different possible values in a destination image, according to their value in a source image.

Namespace: Euresys.Open_eVision

[C#]

```
void Threshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint threshold,
 byte lowValue,
 byte highValue,
 float relativeThreshold
 )

void Threshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint threshold,
 byte lowValue,
 byte highValue,
 float relativeThreshold
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

```
void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint threshold
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint threshold
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint threshold,
 Euresys.Open_eVision.EBW16 lowValue,
 Euresys.Open_eVision.EBW16 highValue
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint threshold,
 Euresys.Open_eVision.EBW16 lowValue,
 Euresys.Open_eVision.EBW16 highValue
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float relativeThreshold
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float relativeThreshold
 )

void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float relativeThreshold,
 Euresys.Open_eVision.EBW16 lowValue,
 Euresys.Open_eVision.EBW16 highValue
 )
```

```
void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 float relativeThreshold,
 Euresys.Open_eVision.EBW16 lowValue,
 Euresys.Open_eVision.EBW16 highValue
 )

void Threshold(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24 minimum,
 Euresys.Open_eVision.EC24 maximum
 )

void Threshold(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24 minimum,
 Euresys.Open_eVision.EC24 maximum
 )

void Threshold(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24 minimum,
 Euresys.Open_eVision.EC24 maximum,
 Euresys.Open_eVision.EColorLookup colorLookupTable,
 Euresys.Open_eVision.EBW8 rejectValue,
 Euresys.Open_eVision.EBW8 acceptValue
 )

void Threshold(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24 minimum,
 Euresys.Open_eVision.EC24 maximum,
 Euresys.Open_eVision.EColorLookup colorLookupTable,
 Euresys.Open_eVision.EBW8 rejectValue,
 Euresys.Open_eVision.EBW8 acceptValue
 )

void Threshold(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24 minimum,
 Euresys.Open_eVision.EC24 maximum,
 Euresys.Open_eVision.EColorLookup colorLookupTable
 )
```

```
void Threshold(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EC24 minimum,
 Euresys.Open_eVision.EC24 maximum,
 Euresys.Open_eVision.EColorLookup colorLookupTable
 )
void Threshold(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint threshold,
 float relativeThreshold
 )
void Threshold(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint threshold,
 float relativeThreshold
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI.

threshold

The value to compare each pixel to

lowValue

Value for pixels below the threshold (by default, 0).

highValue

Value for pixels above the threshold (by default, it is set to 255 for BW8 destination images and 65535 for BW16 destination images).

relativeThreshold

Fraction of the image pixels that will be set below the threshold. Only used when the threshold value is Relative (by default, 0.5). This value must be greater than (or equal to) 0 and strictly less than 1.

region

Pointer to a region to apply the function only on a particular region in the image.

minimum

Three lower thresholds combined in a single color value.

maximum

Three upper thresholds combined in a single color value.

colorLookupTable

Pointer to the color lookup table to be applied before thresholding, if any.

rejectValue

Value for pixels falling outside the range (by default, 0).

acceptValue

Value for pixels falling inside the range (by default, 255).

Remarks

When the source image is gray-level, the pixel values are measured against a threshold. All pixels below this threshold will yield a low value in the destination image, and all pixels above or on the threshold will yield a high value.
When the destination image is binary (BW1 pixel type), then the values are set to 0 or 1, according to the criterion.
When the destination image is gray-level (BW8 or BW16), then the values are set to 0 or to the maximum pixel value for the image type (255 for BW8 and 65535 for BW16). In some overloads, these minimum and maximum destination values can be specified.
When the source image is gray-level, several modes are available: absolute (the threshold value is given), relative (the threshold value is computed to obtain a desired fraction of the image pixels), or automatic (using three different criteria). In the function overloads where this mode cannot be specified, it is assumed to be absolute.
If the source image is color, all pixels whose components are comprised in a range of values (minimum to maximum) will be set to a constant value (white by default), while other pixels will be set to another constant value (black by default). In this case, if a color lookup is specified, it is applied on the fly to the color image before thresholding.
The simpler color image overload does not support the use of an on-the-fly color lookup table nor rejectValue/acceptValue arguments. On the other hand, it has been MMX optimized, and will run significantly faster when the acceptance region is large.

EasyImage.Transpose

Transpose an image.

Namespace: Euresys.Open_eVision

[C#]

```
void Transpose(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Transpose(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Transpose(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Transpose(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )

void Transpose(
 Euresys.Open_eVision.EROIBW16 sourceImage
 )
```

```
void Transpose(
 Euresys.Open_eVision.EROIC24 sourceImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. May not be the same as the source image.

Remarks

Destination image/roi width and height should be respectively equal to source image/roi height and width.

EasyImage.TwoLevelsMinResidueThreshold

Computes the threshold value used to separate the pixels of an image in two classes.

Namespace: Euresys.Open_eVision

[C#]

```
float TwoLevelsMinResidueThreshold(
 Euresys.Open_eVision.EBWHistogramVector histogram,
 out Euresys.Open_eVision.EBW8 firstWhitePixelValue,
 out float averageBlack,
 out float averageWhite
 )
```

Parameters

histogram

Histogram of the image.

firstWhitePixelValue

Threshold.

averageBlack

Average value of the black pixels (pixels under the threshold).

averageWhite

Average value of the white pixels (pixels over the threshold).

Remarks

This value is computed using the minimum residue criterion from the histogram of the image. The function returns the minimum residue as per the method. The residue is the Euclidian distance between the source image and the thresholded image.

EasyImage.Uniformize

Shading correction is the process of transforming the gray or color component values of an image, using one or two reference images or vectors.

Namespace: Euresys.Open_eVision

[C#]

```
void Uniformize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 pixelReference,
 Euresys.Open_eVision.EROIBW8 imageReference,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool multiplicative
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 pixelReference,
 Euresys.Open_eVision.EROIBW16 imageReference,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 bool multiplicative
 )

void Uniformize(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24 pixelReference,
 Euresys.Open_eVision.EROIC24 imageReference,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool multiplicative
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 pixelReference,
 Euresys.Open_eVision.EBW8Vector vectorOfPixelReference,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool multiplicative
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 pixelReference,
 Euresys.Open_eVision.EBW16Vector vectorOfPixelReference,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 bool multiplicative
 )
```

```
void Uniformize(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24 pixelReference,
 Euresys.Open_eVision.EC24Vector vectorOfPixelReference,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool multiplicative
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 pixelLightReference,
 Euresys.Open_eVision.EROIBW8 imageLightReference,
 Euresys.Open_eVision.EBW8 pixelDarkReference,
 Euresys.Open_eVision.EROIBW8 imageDarkReference,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 pixelLightReference,
 Euresys.Open_eVision.EROIBW16 imageLightReference,
 Euresys.Open_eVision.EBW16 pixelDarkReference,
 Euresys.Open_eVision.EROIBW16 imageDarkReference,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )

void Uniformize(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24 pixelLightReference,
 Euresys.Open_eVision.EROIC24 imageLightReference,
 Euresys.Open_eVision.EC24 pixelDarkReference,
 Euresys.Open_eVision.EROIC24 imageDarkReference,
 Euresys.Open_eVision.EROIC24 destinationImage
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EBW8 pixelLightReference,
 Euresys.Open_eVision.EBW8Vector vectorOfPixelLightReference,
 Euresys.Open_eVision.EBW8 pixelDarkReference,
 Euresys.Open_eVision.EBW8Vector vectorOfPixelDarkReference,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )

void Uniformize(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EBW16 pixelLightReference,
 Euresys.Open_eVision.EBW16Vector vectorOfPixelLightReference,
 Euresys.Open_eVision.EBW16 pixelDarkReference,
 Euresys.Open_eVision.EBW16Vector vectorOfPixelDarkReference,
 Euresys.Open_eVision.EROIBW16 destinationImage
 )
```

```
void Uniformize(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EC24 pixelLightReference,
 Euresys.Open_eVision.EC24Vector vectorOfPixelLightReference,
 Euresys.Open_eVision.EC24 pixelDarkReference,
 Euresys.Open_eVision.EC24Vector vectorOfPixelDarkReference,
 Euresys.Open_eVision.EROIC24 destinationImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

pixelReference

Constant value to transform the reference image or vector into.

imageReference

Pointer to the reference source image/ROI or vector.

destinationImage

Pointer to the destination image/ROI.

multiplicative

true, if the transform is multiplicative (gain); false, if the transform is additive (offset) (by default, true).

vectorOfPixelReference

Constant value to transform the reference image or vector into.

pixelLightReference

Constant value to transform the light reference image or vector into.

imageLightReference

Pointer to the light reference source image/ROI or vector.

pixelDarkReference

Constant value to transform the dark reference image/ROI or vector into.

imageDarkReference

Pointer to the dark reference source image/ROI or vector.

vectorOfPixelLightReference

Constant value to transform the light reference image or vector into.

vectorOfPixelDarkReference

Constant value to transform the dark reference image/ROI or vector into.

Remarks

The intent is to compensate for non-uniform lighting or sensor response non-uniformity by providing images of the background with no foreground object present.
In the case of area-scan cameras, the illumination can change anywhere in the field of view, requiring 2D compensation. In the case of line-scan cameras imaging moving parts, illumination remains constant across image rows. Only 1D compensation is required. In this case, the reference illumination is specified as a vector, which is replicated across all image rows.
* When a single reference image is used, the transform is analog to an adaptive (space-variant) gain *or* offset (Gain * Intensity or Intensity + Offset); the transform lets the reference image(s) become a specified constant value, i.e. flat field illumination.
* When two reference images are used, the transform is analog to adaptive gain *and* offset (Gain * Intensity + Offset); the transform let both reference images become specified constants, i.e. flat field illumination with a correct black reference.

Note. The reference image(s) should be chosen such that they contain no saturated pixel values (remain in the linear domain) and little (filtered out) noise.

EasyImage.VerticalMirror

Mirrors an image vertically (the rows are swapped).

Namespace: Euresys.Open_eVision

[C#]

```
void VerticalMirror(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void VerticalMirror(
 Euresys.Open_eVision.EROIBW16 sourceImage
 )
void VerticalMirror(
 Euresys.Open_eVision.EROIC24 sourceImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

EasyImage.Warp

Transforms an image so that each pixels are moved to the locations specified in the "warp" images used as look-up tables.

Namespace: Euresys.Open_eVision

```
[C#]
void Warp(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 Euresys.Open_eVision.EImageBW16 warpImageX,
 Euresys.Open_eVision.EImageBW16 warpImageY,
 int shiftX,
 int shiftY
 )
void Warp(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 Euresys.Open_eVision.EImageBW16 warpImageX,
 Euresys.Open_eVision.EImageBW16 warpImageY,
 int shiftX,
 int shiftY
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

destinationImage
Pointer to the destination image/ROI.

warpImageX
Pointer to the X lookup image.

warpImageY
Pointer to the Y lookup image.

shiftX
Horizontal translation.

shiftY
Vertical translation.

Remarks

For example, pixel [10,20] moves to location [WarpXImage[10,20], WarpYImage[10,20]].

EasyImage.WeightedMoments

Computes the zero-th, first, second, third or fourth order weighted moments on the gray-level image. The weight of a pixel is its gray-level value.

Namespace: Euresys.Open_eVision

[C#]

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float M,
 out float Mx,
 out float My
 )

void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float M,
 out float Mx,
 out float My
 )

void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My
 )

void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My
 )

void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )

void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
```

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy
 )
```

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy,
 out float Mxxxx,
 out float Mxxxy,
 out float Mxxyy,
 out float Mxyyy,
 out float Myyyy
 )
```

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy,
 out float Mxxxx,
 out float Mxxxy,
 out float Mxxyy,
 out float Mxyyy,
 out float Myyyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy,
 out float Mxxxx,
 out float Mxxxy,
 out float Mxxyy,
 out float Mxyyy,
 out float Myyyy
 )
```

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy,
 out float Mxxxx,
 out float Mxxxy,
 out float Mxxyy,
 out float Mxyyy,
 out float Myyyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
```

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy
 )
```

```
void WeightedMoments(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy,
 out float Mxxxx,
 out float Mxxxy,
 out float Mxxyy,
 out float Mxyyy,
 out float Myyyy
 )
void WeightedMoments(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 mask,
 out float M,
 out float Mx,
 out float My,
 out float Mxx,
 out float Mxy,
 out float Myy,
 out float Mxxx,
 out float Mxxy,
 out float Mxyy,
 out float Myyy,
 out float Mxxxx,
 out float Mxxxy,
 out float Mxxyy,
 out float Mxyyy,
 out float Myyyy
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

M

Reference to the zero-th order weighted moment (total gray value).

Mx

Reference to the first order moments (weighted sums of abscissas and ordinates).

My

Reference to the first order moments (weighted sums of abscissas and ordinates).

region

Pointer to a region to apply the function only on a particular region in the image.

Mxx

Reference to the second order uncentered moments (weighted sums of squared abscissas, cross-product and squared ordinates).

Mxy

Reference to the second order uncentered moments (weighted sums of squared abscissas, cross-product and squared ordinates).

Myy

Reference to the second order uncentered moments (weighted sums of squared abscissas, cross-product and squared ordinates).

Mxxx

Reference to the third order uncentered moments (weighted sums of third order products).

Mxxy

Reference to the third order uncentered moments (weighted sums of third order products).

Mxyy

Reference to the third order uncentered moments (weighted sums of third order products).

Myyy

Reference to the third order uncentered moments (weighted sums of third order products).

Mxxxx

Reference to the fourth order uncentered moments (weighted sums of fourth order products).

Mxxxy

Reference to the fourth order uncentered moments (weighted sums of fourth order products).

Mxxyy

Reference to the fourth order uncentered moments (weighted sums of fourth order products).

Mxyyy

Reference to the fourth order uncentered moments (weighted sums of fourth order products).

Myyyy

Reference to the fourth order uncentered moments (weighted sums of fourth order products).

mask

Pointer to a mask to apply the function only on a particular region in the image. Note: the mask must have the same size as the source image.

EasyImage.WhiteTopHatBox

Performs a top-hat filtering on an image (source image minus open image) on a rectangular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void WhiteTopHatBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void WhiteTopHatBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void WhiteTopHatBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void WhiteTopHatBox(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void WhiteTopHatBox(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void WhiteTopHatBox(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )

void WhiteTopHatBox(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth; 0 is allowed).

region

Region to apply the function on.

Remarks

This filter enhances the thin white features.

EasyImage.WhiteTopHatDisk

Performs a top-hat filtering on an image (source image minus open image) on a circular kernel.

Namespace: Euresys.Open_eVision

[C#]

```
void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )

void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )

void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )

void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 uint halfOfKernelWidth
 )
```

```
void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIBW16 destinationImage,
 uint halfOfKernelWidth
 )
void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.EROIC24 destinationImage,
 uint halfOfKernelWidth
 )
void WhiteTopHatDisk(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW1 destinationImage,
 uint halfOfKernelWidth
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

destinationImage

Pointer to the destination image/ROI. Must not be the same as the source image.

halfOfKernelWidth

Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

region

Region to apply the function on.

Remarks

This filter enhances the thin white features.

4.24. EasyObject Class

This class contains static properties and methods specific to the EasyObject library.

Namespace: Euresys.Open_eVision

Methods

ContourArea	Computes the area of an object from its contour.
ContourGravityCenter	Computes the area and gravity center of an object from its contour.
ContourInertia	Computes the inertia parameters of an object from its contour.
IsFloatFeature	Tests whether a given feature is associated with floating-point values.
IsIntegerFeature	Tests whether a given feature is associated with integer values.

IsUnsignedIntegerFeature	Tests whether a given feature is associated with unsigned integer values.

EasyObject.ContourArea

Computes the area of an object from its contour.

Namespace: Euresys.Open_eVision

```
[C#]
void ContourArea(
 Euresys.Open_eVision.EPathVector pPathVector,
 ref int n32Area
 )
```

Parameters

pPathVector

Pointer to the source vector.

n32Area

Reference to the area to compute.

EasyObject.ContourGravityCenter

Computes the area and gravity center of an object from its contour.

Namespace: Euresys.Open_eVision

```
[C#]
void ContourGravityCenter(
 Euresys.Open_eVision.EPathVector pPathVector,
 ref int n32Area,
 ref float f32GravityCenterX,
 ref float f32GravityCenterY
 )
```

Parameters

pPathVector

Pointer to the source vector.

n32Area

Reference to the area to compute.

f32GravityCenterX

Reference to the abscissa of the gravity center to compute.

f32GravityCenterY

Reference to the ordinate of the gravity center to compute.

EasyObject.ContourInertia

Computes the inertia parameters of an object from its contour.

Namespace: Euresys.Open_eVision

```
[C#]
void ContourInertia(
 Euresys.Open_eVision.EPathVector pPathVector,
 ref int n32Area,
 ref float f32GravityCenterX,
 ref float f32GravityCenterY,
 ref float f32SigmaX,
 ref float f32SigmaY,
 ref float f32SigmaXY
 )
```

Parameters

pPathVector

Pointer to the source vector.

n32Area

Reference to the area to compute.

f32GravityCenterX

Reference to the abscissa of the gravity center to compute.

f32GravityCenterY

Reference to the ordinate of the gravity center to compute.

f32SigmaX

Centered cross moment of inertia.

f32SigmaY

Centered moment of inertia around Y.

f32SigmaXY

Centered cross moment of inertia.

EasyObject.IsFloatFeature

Tests whether a given feature is associated with floating-point values.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsFloatFeature(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature.

Remarks

Most features are floating-point. The exceptions are listed in these functions: EasyObject::IsUnsignedIntegerFeature and EasyObject::IsIntegerFeature.

EasyObject.IsIntegerFeature

Tests whether a given feature is associated with integer values.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsIntegerFeature(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature.

Remarks

The features associated with integer values are: ContourX, ContourY, LeftLimit, RightLimit, TopLimit, and BottomLimit.

EasyObject.IsUnsignedIntegerFeature

Tests whether a given feature is associated with unsigned integer values.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsUnsignedIntegerFeature(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature.

Remarks

The features associated with unsigned integer values are: ElementIndex, LayerIndex, RunCount, Area and LargestRun.

4.25. EBarCode Class

This class is deprecated.

Manages a complete context for the reading or verification of bar codes in EasyBarCode. Deprecated, use EBarCodeReader instead

Namespace: Euresys.Open_eVision

Properties

AdditionalSymbologies	Enabled symbologies belonging to the group of additional symbologies.
Angle	Orientation of the shape.
Center	Center point of the EBarCode.
CenterX	Abscissa of the origin point of the EBarCode.
CenterY	Ordinate of the origin point of the EBarCode.
KnownLocation	Flag indicating whether the symbol location is known or not.
KnownModule	Flag indicating whether the symbol module is known or not.
Module	Module value.
NumDecodedSymbologies	Number of symbologies (among the enabled ones) for which the decoding process was successful.
NumEnabledSymbologies	Number of enabled symbologies.
Rectangle	Sets the nominal position (center coordinates), size and rotation angle of the symbol bounding box according to a known rectangle.
RectangleShape	Get the rectangle shape associated with the EBarCode.
RelativeReadingSizeX	Reading area width, relative to the symbol extent.
RelativeReadingSizeY	Reading area height, relative to the symbol extent.
RelativeReadingX	Reading area abscissa, relative to the symbol position.
RelativeReadingY	Reading area ordinate, relative to the symbol position.
SizeX	X size of the EBarCode
SizeY	Y size of the EBarCode
StandardSymbologies	Enabled symbologies belonging to the group of standard symbologies.
ThicknessRatio	Bars thickness ratio.
VerifyChecksum	"VerifyChecksum" mode.

Methods

Decode	Provides the decoded information (or a reading error code) corresponding to the specified symbology.
Detect	Processes the image, reads the possible contents of the bar code corresponding to all enabled symbologies and rates their likeliness.
Drag	Moves a handle to a new position and updates the position parameters of the symbol bounding box.
Draw	Draws the symbol bounding box.
DrawWithCurrentPen	Draws the symbol bounding box.
EBarCode	Creates an EBarCode object.
GetDecodedAngle	Allows retrieving the bar code reading angle, pertaining to the specified symbology, or, at least, to the most likely symbology.
GetDecodedDirection	Returns the encoding direction of the bar code, pertaining to the specified symbology, or, at least, to the most likely symbology.
GetDecodedRectangle	Allows retrieving the bar code reading rectangle, pertaining to the specified symbology, or, at least, to the most likely symbology.
GetDecodedSymbology	Returns the identifier of one of the symbologies that were successfully decoded.
GetSymbologyName	Retrieves the name of given symbology as a string.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Load	Loads an EBarCode.The given EBarCode must have been created for reading.
Read	Processes the image, reads the possible contents of the bar code and returns the single possible decoding (mono-symbology) or the most likely one (multi-symbology) or a reading error code.
Save	Loads an EBarCode.The given EBarCode must have been created for writing.
SetCenterXY	Sets the center coordinates of a EBarCode object.
SetReadingCenter	Sets the reading area center coordinates, relative to the symbol position and extent.
SetReadingSize	Sets the reading area size, relative to the symbol extent.
SetSize	Sets the size of a EBarCode object.

EBarCode.AdditionalSymbologies

This property is deprecated.

Enabled symbologies belonging to the group of additional symbologies.

Namespace: Euresys.Open_eVision

[C#]

```
uint AdditionalSymbologies
    { get; set; }
```

Remarks

Due to the large number of supported symbologies, they have been gathered in two groups. For more information about these groups, see ESymbologies.

EBarCode.Angle

This property is deprecated.

Orientation of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
    { get; set; }
```

EBarCode.Center

This property is deprecated.

Center point of the EBarCode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
    { get; set; }
```

EBarCode.CenterX

This property is deprecated.

Abscissa of the origin point of the EBarCode.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
    { get; }
```

EBarCode.CenterY

This property is deprecated.

Ordinate of the origin point of the EBarCode.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

EBarCode.Decode

This method is deprecated.

Provides the decoded information (or a reading error code) corresponding to the specified symbology.

Namespace: Euresys.Open_eVision

[C#]

```
string Decode(
 Euresys.Open_eVision.ESymbologies symbology
 )
```

Parameters

symbology

Specified symbology, as defined by ESymbologies this symbology must have been enabled).

Remarks

Before calling EBarCode::Decode, an EBarCode::Detect operation must have been performed. In case of the mono-symbology mode, or if only the most likely decoding matters, the EBarCode::Read method should be used.

EBarCode.Detect

This method is deprecated.

Processes the image, reads the possible contents of the bar code corresponding to all enabled symbologies and rates their likeliness.

Namespace: Euresys.Open_eVision

[C#]

```
void Detect(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
```

Parameters

sourceImage

Pointer to the image containing the bar code.

Remarks

Processing the image means finding the symbol (in case of automatic location mode) and retrieving its descriptive parameters. The decoded information corresponding to a specific symbology is provided by the decode function. The symbologies that were successfully decoded are ranked by decreasing likeliness (range 0 to NumDecodedSymbologies-1). In case of the mono-symbology mode or if only the most likely decoding matters, the Read function should be used.

EBarCode.Drag

This method is deprecated.

Moves a handle to a new position and updates the position parameters of the symbol bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int cursorX,
 int cursorY
 )
```

Parameters

cursorX

Cursor current coordinates.

cursorY

Cursor current coordinates.

EBarCode.Draw

This method is deprecated.

Draws the symbol bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the symbol bounding box must be displayed, as defined by EDrawingMode.

daughters

true if the shapes attached to the symbol bounding box are to be displayed as well.

color

The color in which to draw the overlay.

Remarks

The bounding box corresponds to the nominal position of the bar code (Nominal), in case this information has been explicitly provided, and to the actual position (Actual) if it has been determined by image analysis. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBarCode.DrawWithCurrentPen

This method is deprecated.

Draws the symbol bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the symbol bounding box must be displayed, as defined by EDrawingMode.

daughters

true if the shapes attached to the symbol bounding box are to be displayed as well.

Remarks

The bounding box corresponds to the nominal position of the bar code (Nominal), in case this information has been explicitly provided, and to the actual position (Actual) if it has been determined by image analysis. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBarCode.EBarCode

This method is deprecated.

Creates an EBarCode object.

Namespace: Euresys.Open_eVision

[C#]

```
void EBarCode(
 )
```

EBarCode.GetDecodedAngle

This method is deprecated.

Allows retrieving the bar code reading angle, pertaining to the specified symbology, or, at least, to the most likely symbology.

Namespace: Euresys.Open_eVision

[C#]

```
void GetDecodedAngle(
 out float decodedAngle
 )

void GetDecodedAngle(
 out float decodedAngle,
 float cutAngle
 )

void GetDecodedAngle(
 Euresys.Open_eVision.ESymbologies symbology,
 out float decodedAngle
 )
```

```
void GetDecodedAngle(
 Euresys.Open_eVision.ESymbologies symbology,
 out float decodedAngle,
 float cutAngle
 )
```

Parameters

decodedAngle

Returned bar code reading angle value.

cutAngle

Cut angle value (degrees) defining the allowed range for the bar code reading angle ([cutAngle, cutAngle + 360]). By default, the cut angle equals -45.

symbology

Specified symbology, as defined by ESymbologies (this symbology must have been enabled).

EBarCode.GetDecodedDirection

This method is deprecated.

Returns the encoding direction of the bar code, pertaining to the specified symbology, or, at least, to the most likely symbology.

Namespace: Euresys.Open_eVision

[C#]

```
void GetDecodedDirection(
 out bool directEncoding
 )

void GetDecodedDirection(
 Euresys.Open_eVision.ESymbologies symbology,
 out bool directEncoding
 )
```

Parameters

directEncoding

Boolean holding the encoding direction status.

symbology

Specified symbology, as defined by ESymbologies (this symbology must have been enabled).

Remarks

The encoding direction of the bar code is "Direct" or "Inverse". The encoding direction is said to be "Direct" when the bar code longitudinal axis falls in the range [-45 degrees, 135]. Conversely, when the bar code longitudinal axis doesn't fall in the previous range, the encoding direction is said to be "Inverse".

EBarCode.GetDecodedRectangle

This method is deprecated.

Allows retrieving the bar code reading rectangle, pertaining to the specified symbology, or, at least, to the most likely symbology.

Namespace: Euresys.Open_eVision

[C#]

```
void GetDecodedRectangle(
 Euresys.Open_eVision.ERectangle rect
 )
void GetDecodedRectangle(
 Euresys.Open_eVision.ESymbologies symbology,
 Euresys.Open_eVision.ERectangle rect
 )
```

Parameters

rect

Returned bar code reading rectangle.

symbology

Specified symbology, as defined by ESymbologies (this symbology must have been enabled).

EBarCode.GetDecodedSymbology

This method is deprecated.

Returns the identifier of one of the symbologies that were successfully decoded.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESymbologies GetDecodedSymbology(
 uint index
 )
```

Parameters

index

Index of the specified symbology (range 0 to NumDecodedSymbologies-1).

Remarks

The desired symbology is specified by its ranking index (range 0 to NumDecodedSymbologies-1). The symbologies that were successfully decoded are ranked by decreasing likeliness.

EBarCode.GetSymbologyName

This method is deprecated.

Retrieves the name of given symbology as a string.

Namespace: Euresys.Open_eVision

```
[C#]
string GetSymbologyName(
 Euresys.Open_eVision.ESymbologies symbology
 )
```

Parameters

symbology

Symbology.

EBarCode.HitTest

This method is deprecated.

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the handles of the shapes attached to the symbol bounding box have to be considered as well.

EBarCode.KnownLocation

This property is deprecated.

Flag indicating whether the symbol location is known or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool KnownLocation
  { get; set; }
```

Remarks

In case of known location, use EBarCode::Rectangle to adjust a rectangle around the symbol.

EBarCode.KnownModule

This property is deprecated.

Flag indicating whether the symbol module is known or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool KnownModule
  { get; set; }
```

Remarks

If true, it is also necessary to get the EBarCode::Module and EBarCode::ThicknessRatio properties in order to specify the requested module and thickness ratio.

EBarCode.Load

This method is deprecated.

Loads an EBarCode.The given EBarCode must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path,
 bool daughters
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer,
 bool daughters
 )
```

Parameters

path

The file path.

daughters

Indicates if the load must be done on the whole hierarchy or just this object.

serializer

Pointer to the ESerializer created for reading.

EBarCode.Module

This property is deprecated.

Module value.

Namespace: Euresys.Open_eVision

```
[C#]
float Module
  { get; set; }
```

Remarks

The module value is a descriptive parameter participating in the encoding; it corresponds to the thinner bar width. Symbols whose bars thickness can take two values, the module and V times the module (where V runs from 1.5 to 3), are called *binary* bar codes. When the bars thickness are small integer multiples (1 to 4 or 5) of a module, the symbols are called *modular* bar codes.

EBarCode.NumDecodedSymbologies

This property is deprecated.

Number of symbologies (among the enabled ones) for which the decoding process was successful.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumDecodedSymbologies
  { get; }
```

EBarCode.NumEnabledSymbologies

This property is deprecated.

Number of enabled symbologies.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumEnabledSymbologies
  { get; }
```

EBarCode.Read

This method is deprecated.

Processes the image, reads the possible contents of the bar code and returns the single possible decoding (mono-symbology) or the most likely one (multi-symbology) or a reading error code.

Namespace: Euresys.Open_eVision

[C#]

```
string Read(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
```

Parameters

sourceImage

The image containing the bar code.

Remarks

Processing the image means finding the symbol (in case of automatic location mode) and retrieving its descriptive parameters. When decoding other than the most likely one are also required, a call to the EBarCode::Detect function followed by a EBarCode::Decode should be used.

EBarCode.Rectangle

This property is deprecated.

Sets the nominal position (center coordinates), size and rotation angle of the symbol bounding box according to a known rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangle Rectangle
  { get; set; }
```

Remarks

An ERectangle object is characterized by its center coordinates, its size and its rotation angle.

EBarCode.RectangleShape

This property is deprecated.

Get the rectangle shape associated with the EBarCode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangleShape RectangleShape
  { get; }
```

EBarCode.RelativeReadingSizeX

This property is deprecated.

Reading area width, relative to the symbol extent.

Namespace: Euresys.Open_eVision

[C#]

```
float RelativeReadingSizeX
  { get; }
```

EBarCode.RelativeReadingSizeY

This property is deprecated.

Reading area height, relative to the symbol extent.

Namespace: Euresys.Open_eVision

[C#]

```
float RelativeReadingSizeY
  { get; }
```

EBarCode.RelativeReadingX

This property is deprecated.

Reading area abscissa, relative to the symbol position.

Namespace: Euresys.Open_eVision

[C#]

```
float RelativeReadingX
  { get; }
```

EBarCode.RelativeReadingY

This property is deprecated.

Reading area ordinate, relative to the symbol position.

Namespace: Euresys.Open_eVision

[C#]

```
float RelativeReadingY
```

```
{ get; }
```

EBarCode.Save

This method is deprecated.

Loads an EBarCode.The given EBarCode must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path,
 bool daughters
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer,
 bool daughters
 )
```

Parameters

path

The file path.

daughters

Indicates if the save must be done on the whole hierarchy or just this object.

serializer

Pointer to the ESerializer created for writing.

EBarCode.SetCenterXY

This method is deprecated.

Sets the center coordinates of a EBarCode object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the EBarCode object.

centerY

Center coordinates of the EBarCode object.

EBarCode.SetReadingCenter

This method is deprecated.

Sets the reading area center coordinates, relative to the symbol position and extent.

Namespace: Euresys.Open_eVision

```
[C#]
void SetReadingCenter(
 float relativeX,
 float relativeY
 )
```

Parameters

relativeX

Reading area center abscissa, relative to the symbol position and extent.

relativeY

Reading area center ordinate, relative to the symbol position and extent.

EBarCode.SetReadingSize

This method is deprecated.

Sets the reading area size, relative to the symbol extent.

Namespace: Euresys.Open_eVision

```
[C#]
void SetReadingSize(
 float relativeSizeX,
 float relativeSizeY
 )
```

Parameters

relativeSizeX

Reading area width, relative to the symbol extent.

relativeSizeY

Reading area height, relative to the symbol extent.

EBarCode.SetSize

This method is deprecated.

Sets the size of a EBarCode object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSize(
 float sizeX,
 float sizeY
 )
```

Parameters

sizeX

Nominal size X of the EBarCode object. Default values is 100.

sizeY

Nominal size Y of the EBarCode object. Default values is 100.

Remarks

A EBarCode object is fully defined knowing its nominal position (given by the coordinates of its center), its nominal size, its rotation angle and its outline tolerance. By default, the width and height values are 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

EBarCode.SizeX

This property is deprecated.

X size of the EBarCode

Namespace: Euresys.Open_eVision

[C#]

```
float SizeX
  { get; }
```

EBarCode.SizeY

This property is deprecated.

Y size of the EBarCode

Namespace: Euresys.Open_eVision

[C#]

```
float SizeY
  { get; }
```

EBarCode.StandardSymbologies

This property is deprecated.

Enabled symbologies belonging to the group of standard symbologies.

Namespace: Euresys.Open_eVision

```
[C#]
uint StandardSymbologies
    { get; set; }
```

Remarks

Due to the large number of supported symbologies, they have been gathered in two groups. For more information about these groups, see ESymbologies.

EBarCode.ThicknessRatio

This property is deprecated.

Bars thickness ratio.

Namespace: Euresys.Open_eVision

```
[C#]
float ThicknessRatio
    { get; set; }
```

Remarks

This property is relevant in case of binary codes only. It corresponds to the ratio of a thin bar width over a thick bar width, and should range from 1.5 to 3.

EBarCode.VerifyChecksum

This property is deprecated.

"VerifyChecksum" mode.

Namespace: Euresys.Open_eVision

```
[C#]
bool VerifyChecksum
    { get; set; }
```

Remarks

The "VerifyChecksum" mode enables or disables verification of the checksum character. That verification mode is set in the same way for all enabled symbologies. It is worth noting that checksum may be present or not in the bar code, and the user may verify or not checksum validity. These two circumstances are independent, and give rise to four modes of operation. The verification process will return an "invalid checksum" error in case of bad checksum character. This error can also be generated if there is no checksum in the bar code. In the other case, when checksum are not verified, no error will occur, and the process will continue silently. When the "VerifyChecksum" mode is enabled, the returned decoded string does not contain the checksum character(s). Conversely, when the verification process is disabled, the checksum character(s) are concatenated to the encoded information.

4.26. EBarCode Class

Represents a 1D Bar Code.

Namespace: Euresys.Open_eVision.EasyBarCode2

Properties

GradingParameters	Grading Parameters according to ISO15416.
Position	Position of the barcode.
Symbologies	Returns all compatible symbologies, in order of likelyhood.
Symbology	Returns the most likely compatible symbology.

Methods

DrawPosition	Draws the BarCode Position.
DrawPositionWithCurrentPen	Draws the BarCode Position using the pen currently set in the graphical context.
EBarCode	Constructs a EBarCode context.
GetChecksumOK	Checksum validity status.
GetDecodedString	Decoded bar code string.
HasGradingParameters	Returns whether the EBarCode contains Grading Parameters.
operator=	Copies all the data from another EBarCode object into the current EBarCode object.

EBarCode.DrawPosition

Draws the BarCode Position.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void DrawPosition(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawPosition(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

Handle of the graphics context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBarCode.DrawPositionWithCurrentPen

This method is deprecated.

Draws the BarCode Position using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void DrawPositionWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBarCode.EBarCode

Constructs a EBarCode context.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EBarCode(
 Euresys.Open_eVision.EasyBarCode2.EBarCode other
 )
```

Parameters

other

Another EBarCode object to be copied in the new EBarCode object.

Remarks

The default constructor constructs an uninitialized EBarCode object. All properties are initialized to their respective default values. The copy constructor constructs a EBarCode context based on a pre-existing EBarCode object. All properties and internal data are copied.

EBarCode.GetChecksumOK

Checksum validity status.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool GetChecksumOK(
 )
bool GetChecksumOK(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies symbology
 )
```

Parameters

symbology

Chosen symbology

Remarks

If the symbology parameter is omitted, the property returns the value pertaining to the barcode's most likely symbology.

EBarCode.GetDecodedString

Decoded bar code string.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
string GetDecodedString(
 bool includeChecksum
 )

string GetDecodedString(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies symbology,
 bool includeChecksum
 )
```

Parameters

includeChecksum

Indicates if the returned string should include the check character (default: true)

symbology

Chosen symbology

Remarks

If the symbology parameter is omitted, the property returns the value pertaining to the barcode's most likely symbology. If you choose to exclude the check character and you use a symbology where it is optional, be sure it is included as the character corresponding to the checksum position will be removed in all cases. When the symbology is Gs1_128, no checksum is returned no matter the value of includeChecksum as it would break the parsing of the machine readable Gs1 code.

EBarCode.GradingParameters

Grading Parameters according to ISO15416.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCodeGradingParameters GradingParameters
  { get; }
```

Remarks

If the most likely symbology does not support grading parameters or EBarCodeReader::ComputeGrading is false, an exception is thrown.

EBarCode.HasGradingParameters

Returns whether the EBarCode contains Grading Parameters.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool HasGradingParameters(
 )
```

EBarCode.operator=

Copies all the data from another EBarCode object into the current EBarCode object.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCode operator=(
 Euresys.Open_eVision.EasyBarCode2.EBarCode other
 )
```

Parameters

other

EBarCode object to be copied

EBarCode.Position

Position of the barcode.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EQuadrangle Position
  { get; }
```

EBarCode.Symbologies

Returns all compatible symbologies, in order of likelyhood.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies[] Symbologies
  { get; }
```

EBarCode.Symbology

Returns the most likely compatible symbology.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies Symbology
  { get; }
```

4.27. EBarCodeGrid Class

-

Namespace: Euresys.Open_eVision.EasyBarCode2

Properties

EnableAll	Enable/Disable all cells
NumCols	Returns the number of columns in the grid
NumRows	Returns the number of rows in the grid

Methods

EBarCodeGrid	Creates an EBarCodeGrid object.
GetCellEnabled	Returns true if Cell is enabled and false otherwise
GetResults	Returns the detected Barcodes
operator=	Assignment operator
SetEnableCell	Enable/Disable Cell
SetEnableColumn	Enable/Disable Column
SetEnableRow	Enable/Disable Row

EBarCodeGrid.EBarCodeGrid

Creates an EBarCodeGrid object.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EBarCodeGrid(
 )
void EBarCodeGrid(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeGrid other
 )
void EBarCodeGrid(
 uint numCols,
 uint numRows
 )
```

Parameters

other

The reference EBarCodeGrid instance to copy this one from.

numCols

The number of columns in the grid.

numRows

The number of rows in the grid.

EBarCodeGrid.EnableAll

Enable/Disable all cells

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool EnableAll
  { get; set; }
```

Remarks

By default, all grid cells are enabled.

EBarCodeGrid.GetCellEnabled

Returns true if Cell is enabled and false otherwise

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool GetCellEnabled(
 uint column,
 uint row
 )
```

Parameters

column

-

row

-

Remarks

By default, all grid cells are enabled.

EBarCodeGrid.GetResults

Returns the detected Barcodes

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
Euresys.Open_eVision.EasyBarCode2.EBarCode[] GetResults(
 )
Euresys.Open_eVision.EasyBarCode2.EBarCode[] GetResults(
 uint column,
 uint row
 )
```

Parameters

column

The column of a cell.

row

The row of a cell.

EBarCodeGrid.NumCols

Returns the number of columns in the grid

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
uint NumCols
  { get; }
```

EBarCodeGrid.NumRows

Returns the number of rows in the grid

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
uint NumRows
  { get; }
```

EBarCodeGrid.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCodeGrid operator=(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeGrid other
 )
```

Parameters

other

The EBarCodeGrid instance to assign.

EBarCodeGrid.SetEnableCell

Enable/Disable Cell

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void SetEnableCell(
 uint column,
 uint row,
 bool enable
 )
```

Parameters

column

-

row

-

enable

-

Remarks

By default, all grid cells are enabled.

EBarCodeGrid.SetEnableColumn

Enable/Disable Column

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
void SetEnableColumn(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

EBarCodeGrid.SetEnableRow

Enable/Disable Row

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
void SetEnableRow(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

4.28. EBarCodeReader Class

Represents a 1D Bar Code Reading Context.

Namespace: Euresys.Open_eVision.EasyBarCode2

Properties

ComputeGrading	Enables or disables the computation of the grades of the read barcodes according to ISO 15416. At the moment, grading is only supported for Code128, Gs1_128 and Ean13.
EnabledSymbologies	Enabled symbologies.
EnablePermissiveDecoding	Enables or disables the decoding of codes containing partially incorrect information. In practice, when this option is set, the reader assumes a character might be badly printed and uses the checksum to correct that character. In rare cases, this option may lead to reading false positives codes. It has no effect for symbologies in which a checksum is not mandatory.
LearningPerformed	Returns whether a learning has been performed on the EBarCodeReader.
MaxNumCodes	Maximum number of barcodes to find in a single Image/ROI.
MinModuleSize	Sets the minimal module size. This is the size in pixels of the smallest module of the barcode in the image. Setting this parameter is helpful when trying to detect small barcodes in large images. In most cases, the min module size is to be set to an integer value, either 1, 2 or 3. Nevertheless, we allow intermediary floating-point values, like 2.5, because the processing time of the EBarCodeReader::Read method is strongly dependent of the minModuleSize.
ReadingOrientation	Some symbologies do not specify start and stop patterns, namely: CodeStk, PharmacodeOneTrack and BinaryCode. In these cases, we do not know if we should decode the barcode from left to right or from right to left. EBarCodeReader::ReadingOrientation solves this problem.
TimeOut	Time-out for the EBarCodeReader::Read method.
UseMinModuleSize	Enables or disables the usage of the minimal module size, see EBarCodeReader::MinModuleSize to set it.
ValidateBarCode	Enables/Disables all barcode validations. Deprecated, use EBarCodeReader::ValidateMandatoryChecksum, EBarCodeReader::ValidateOptionalChecksum and EBarCodeReader instead.
ValidateMandatoryChecksum	Enables/Disables checksum validation for all symbologies for which a checksum is mandatory, for example Code128. See complete list at https://documentation.euresys.com/Products/OPEN_EVISION/OPEN_EVISION/en-us/Content/00_Home/List_of_Supported_Codes.htm
ValidateOptionalChecksum	Enables/Disables checksum validation for all symbologies for which a checksum is optional, for example Code39. See complete list at https://documentation.euresys.com/Products/OPEN_EVISION/OPEN_EVISION/en-us/Content/00_Home/List_of_Supported_Codes.htm

ValidatePharmacode	Enables/Disables validation for the PharmacodeOneTrack symbology.
ValidateWithChecksum	Enables/Disables all barcode validations. Deprecated, use EBarCodeReader::ValidateMandatoryChecksum, EBarCodeReader::ValidateOptionalChecksum and EBarCodeReader instead.

Methods

DisableAllSymbologies	Disables all symbologies.
EBarCodeReader	Constructs a EBarCodeReader context.
EnableAllSymbologies	Enables all supported symbologies, with the exception of CodeStk, PharmacodeOneTrack and BinaryCode because they might interfere with other symbologies.
EnableDefaultSymbologies	Enables default symbologies.
EnableSymbologies	Enables a set of symbologies.
EnableSymbology	Enables a single symbology.
Learn	Learns the best options to use to read the given Images/ROIs. The EBarCodeReader::MinModuleSize is modified as well as the scales at which we detect barcodes. The other options (symbologies, checksum verification, max number of codes, ...) must be set by the user so that the codes are read correctly.
Load	Load the reader configuration.
operator=	Copies all the data from another EBarCodeReader object into the current EBarCodeReader object.
Read	Finds and reads all the barcodes in the provided Image/ROI.
ResetLearning	Forgets the learned parameter settings and resets them to their default values.
Save	Save the reader configuration.

EBarCodeReader.ComputeGrading

Enables or disables the computation of the grades of the read barcodes according to ISO 15416.
At the moment, grading is only supported for Code128, Gs1_128 and Ean13.

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
bool ComputeGrading
  { get; set; }
```

Remarks

ComputeGrading is disabled by default.

EBarCodeReader.DisableAllSymbologies

Disables all symbologies.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void DisableAllSymbologies(
 )
```

EBarCodeReader.EBarCodeReader

Constructs a EBarCodeReader context.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EBarCodeReader(
 )
void EBarCodeReader(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeReader other
 )
```

Parameters

other

Another EBarCodeReader object to be copied in the new EBarCodeReader object.

Remarks

The default constructor constructs an uninitialized EBarCodeReader object. All properties are initialized to their respective default values. The copy constructor constructs a EBarCodeReader context based on a pre-existing EBarCodeReader object. All properties and internal data are copied.

EBarCodeReader.EnableAllSymbologies

Enables all supported symbologies, with the exception of CodeStk, PharmacodeOneTrack and BinaryCode because they might interfere with other symbologies.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EnableAllSymbologies(
 )
```

EBarCodeReader.EnableDefaultSymbologies

Enables default symbologies.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EnableDefaultSymbologies(
 )
```

EBarCodeReader.EnabledSymbologies

Enabled symbologies.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies[] EnabledSymbologies
  { get; }
```

EBarCodeReader.EnablePermissiveDecoding

Enables or disables the decoding of codes containing partially incorrect information.
In practice, when this option is set, the reader assumes a character might be badly printed and uses the checksum to correct that character. In rare cases, this option may lead to reading false positives codes. It has no effect for symbologies in which a checksum is not mandatory.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool EnablePermissiveDecoding
  { get; set; }
```

Remarks

Permissive decoding is enabled by default.

EBarCodeReader.EnableSymbologies

Enables a set of symbologies.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EnableSymbologies(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies[] symbologies
 )
```

Parameters

symbologies

-

EBarCodeReader.EnableSymbology

Enables a single symbology.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void EnableSymbology(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeSymbologies symbology
 )
```

Parameters

symbology

-

EBarCodeReader.Learn

Learns the best options to use to read the given Images/ROIs. The EBarCodeReader::MinModuleSize is modified as well as the scales at which we detect barcodes. The other options (symbologies, checksum verification, max number of codes, ...) must be set by the user so that the codes are read correctly.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
float Learn(
 Euresys.Open_eVision.EROIBW8[] rois,
 bool keepDefaultScales,
 bool addAllScales
 )
float Learn(
 Euresys.Open_eVision.EImageBW8[] images,
 bool keepDefaultScales,
 bool addAllScales
 )
```

Parameters

rois

ROIs in which to find the barcodes.

keepDefaultScales

if true, Learning does not remove the scales used by default even if they are useless for the given images. Default: true

addAllScales

if true, Learning adds all of the scales at which a code is detected. Otherwise, the smallest number of scales required to read all of the images is added. Default: true

images

Images in which to find the barcodes.

Remarks

Adding more scales does not necessarily makes the reading slower, as processing stops as soon as we find the required number of codes. On the other hand, having too few scales can make the reading fail. The is why the default scales are kept and all the interesting scales are added by default.

EBarCodeReader.LearningPerformed

Returns whether a learning has been performed on the EBarCodeReader.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool LearningPerformed
  { get; }
```

Remarks

Note that after a failed call to EBarCodeReader::Learn (the value of 0 was returned), calling this method will returns false.

EBarCodeReader.Load

Load the reader configuration.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void Load(
 string file
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

file

File path.

serializer

Serializer. Must be in read mode.

EBarCodeReader.MaxNumCodes

Maximum number of barcodes to find in a single Image/ROI.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
uint MaxNumCodes
  { get; set; }
```

Remarks

By default, this parameter is set to 1.

EBarCodeReader.MinModuleSize

Sets the minimal module size. This is the size in pixels of the smallest module of the barcode in the image. Setting this parameter is helpful when trying to detect small barcodes in large images.
In most cases, the min module size is to be set to an integer value, either 1, 2 or 3. Nevertheless, we allow intermediary floating-point values, like 2.5, because the processing time of the EBarCodeReader::Read method is strongly dependent of the minModuleSize.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
float MinModuleSize
  { get; set; }
```

Remarks

Setting the minModuleSize automatically enables its use, see EBarCodeReader::UseMinModuleSize. If the min module size is used but never set, it is considered to be 1 pixel.

EBarCodeReader.operator=

Copies all the data from another EBarCodeReader object into the current EBarCodeReader object.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCodeReader operator=(
 Euresys.Open_eVision.EasyBarCode2.EBarCodeReader other
 )
```

Parameters

other

EBarCodeReader object to be copied.

EBarCodeReader.Read

Finds and reads all the barcodes in the provided Image/ROI.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EBarCode[] Read(
 Euresys.Open_eVision.EROIBW8 img
 )

Euresys.Open_eVision.EasyBarCode2.EBarCode[] Read(
 Euresys.Open_eVision.EROIBW8 img,
 Euresys.Open_eVision.ERegion region
 )

Euresys.Open_eVision.EasyBarCode2.EBarCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 field,
 Euresys.Open_eVision.ERectangleRegion area,
 int numCellsX,
 int numCellsY,
 float extension
 )

Euresys.Open_eVision.EasyBarCode2.EBarCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 field,
 Euresys.Open_eVision.ERectangleRegion area,
 Euresys.Open_eVision.EasyBarCode2.EBarCodeGrid grid,
 float extension
 )
```

Parameters

img
Image/ROI in which to find the barcodes.

region
Optional region used to reduce the search domain.

field
-

area
Rectangular Region used as the full grid area

numCellsX
Number of grid cells in the X direction

numCellsY
Number of grid cells in the Y direction

extension
Extension of the grid cells to allow cell overlap. For instance, 0.0f means no extension and 0.1f means a 10% cell size extension. default: 0.0f

grid
Grid with cell disabling capabilities

Remarks

The grid overload allows you to disable some cells of the grid if those cells are not supposed to contain barcodes. See the EBarCodeGrid class documentation for more information.

EBarCodeReader.ReadingOrientation

Some symbologies do not specify start and stop patterns, namely: CodeStk, PharmacodeOneTrack and BinaryCode. In these cases, we do not know if we should decode the barcode from left to right or from right to left. EBarCodeReader::ReadingOrientation solves this problem.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
Euresys.Open_eVision.EasyBarCode2.EReadingOrientation ReadingOrientation
  { get; set; }
```

Remarks

The default orientation is LeftToRight.

EBarCodeReader.ResetLearning

Forgets the learned parameter settings and resets them to their default values.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void ResetLearning(
 )
```

EBarCodeReader.Save

Save the reader configuration.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
void Save(
 string file
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

file

File path.

serializer

Serializer. Must be in write mode.

EBarCodeReader.TimeOut

Time-out for the EBarCodeReader::Read method.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
System.UInt64 TimeOut
  { get; set; }
```

Remarks

If the processing time of one of these functions becomes longer than the set time-out, the processing is stopped and an exception is thrown.
In that case, the error code of the exception is TimeoutReached.
The time-out is set in microseconds.
This time-out is not a real time-out.
The processing is stopped as soon as possible after the time-out has been reached.
This means that the time elapsed effectively in the method can be greater than the time-out itself.

EBarCodeReader.UseMinModuleSize

Enables or disables the usage of the minimal module size, see EBarCodeReader::MinModuleSize to set it.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool UseMinModuleSize
  { get; set; }
```

Remarks

The minimal module size is not used by default.

EBarCodeReader.ValidateBarCode

Enables/Disables all barcode validations.
Deprecated, use EBarCodeReader::ValidateMandatoryChecksum, EBarCodeReader::ValidateOptionalChecksum and EBarCodeReader instead.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
bool ValidateBarCode
  { get; set; }
```

Remarks

If this validation is enabled, barcodes with an erroneous checksum will not be returned.
For the PharmaCodeOneTrack symbology, no checksum is computed. We instead validate that the barcode is coherent along its height and that the relative width of the bars/space are coherent with the symbology's specification. This allow to reduce the number of false positives significantly.

Some symbologies have an optional checksum, for example Code39, for these symbologies, enforcing checksum validation comes at the risk of removing good barcodes that do not have a checksum. See complete list at https://documentation.euresys.com/Products/OPEN_EVISION/OPEN_EVISION/en-us/Content/00_Home/List_of_Supported_Codes.htm.

By default, validation is enforced when checksum is mandatory for the symbology and for Pharmacodes.

EBarCodeReader.ValidateMandatoryChecksum

Enables/Disables checksum validation for all symbologies for which a checksum is mandatory, for example Code128.
See complete list at https://documentation.euresys.com/Products/OPEN_EVISION/OPEN_EVISION/en-us/Content/00_Home/List_of_Supported_Codes.htm

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
bool ValidateMandatoryChecksum
    { get; set; }
```

Remarks

If validation is enabled for symbologies with a mandatory checksum, barcodes of these symbologies with an erroneous checksum will not be returned.
By default, validation is enforced when checksum is mandatory.

EBarCodeReader.ValidateOptionalChecksum

Enables/Disables checksum validation for all symbologies for which a checksum is optional, for example Code39.
See complete list at https://documentation.euresys.com/Products/OPEN_EVISION/OPEN_EVISION/en-us/Content/00_Home/List_of_Supported_Codes.htm

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
bool ValidateOptionalChecksum
    { get; set; }
```

Remarks

If validation is enabled for symbologies with an optional checksum, barcodes of these symbologies with an erroneous checksum will not be returned.
By default, validation is not enforced when checksum is optional to avoid removing correct codes.

EBarCodeReader.ValidatePharmacode

Enables/Disables validation for the PharmacodeOneTrack symbology.

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
bool ValidatePharmacode
    { get; set; }
```

Remarks

Pharmacodes are validated by checking that the barcode is coherent along its height and that the relative width of the bars/space are coherent with the symbology's specification. This allows to reduce the number of false positives significantly.
By default, validation is enforced for Pharmacodes.

EBarCodeReader.ValidateWithChecksum

This property is deprecated.

Enables/Disables all barcode validations.
Deprecated, use EBarCodeReader::ValidateMandatoryChecksum, EBarCodeReader::ValidateOptionalChecksum and EBarCodeReader instead.

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
bool ValidateWithChecksum
  { get; set; }
```

4.29. EBaseROI Class

This represents the abstract base class for all ROI and image classes.

Derived Class (es):
EROIBW1
EROIBW16EROIBW32EROIBW32fEROIBW8EROIC15EROIC16EROIC24EROIC24AEROIC48

Namespace: Euresys.Open_eVision

Properties

Author	Gets or sets the Author attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.
BaseTopParent	Returns the image at the top of the hierarchy, or NULL if there is no image on top.
BitsPerPixel	Gets the number of storage bits per pixel.
ColorSystem	Gets or sets the color system used by this image, as defined by the EColorSystem enumeration.
ColPitch	Gets the pitch of a column (number of bytes between two horizontally adjacent pixels). For BW1 (one bit per pixel) images, this value is undefined.
Comment	Gets or sets the Comment attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.
Date	Gets or sets the Date attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.
Height	Gets or sets the height of the ROI.

IsVoid	Tests whether if the topmost parent image of this hierarchy has a zero size.
OrgX	Gets or sets the x-coordinate of the upper left corner of the ROI, relative to its parent ROI/image.
OrgY	Gets or sets the y-coordinate of the upper left corner of the ROI, relative to its parent ROI/image.
Parent	Returns the hierarchical parent of this object.
PlanesPerPixel	Gets the number of color components in each pixel of the ROI/image.
RowPitch	Gets the pitch of a row (the number of bytes between two vertically adjacent pixels). This is also valid for BW1 images (one bit per pixel).
Title	Gets or sets the Title attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.
TotalHeight	Gets the height, in pixels, of the ROI topmost parent.
TotalOrgX	Gets the x-coordinate of the upper left pixel of the ROI, relative to its topmost parent upper left pixel.
TotalOrgY	Gets the y-coordinate of the upper left pixel of the ROI, relative to its topmost parent upper left pixel.
TotalWidth	Gets the width, in pixels, of the ROI topmost parent.
Type	Gets the ROI/image pixel type, as defined by the EImageType enumeration.
Width	Gets or sets the width of the ROI.

Methods

Attach	This method attaches the ROI to another ROI or image. Only ROIs can be attached. An image can never be attached to another image or ROI. Optionally, the ROI can be moved and resized after attachment by supplying additional parameters.
CopyTo	Copies all the data of the current EBaseROI object into another EBaseROI object and returns it.
CropToImage	This method reduces the ROI size so that it is completely contained within its topmost parent image bounds (if such an image exists at the top of the hierarchy). This means that, after calling this method, either the ROI has a zero size, or all of its pixels map to valid pixels of the underlying image buffer. If the ROI is already contained within its parent image bounds, then this method does nothing.
Drag	Moves the specified handle to a new position and updates all placement parameters of the ROI.
Draw	Draws an ROI/image in a device context.
DrawFrame	Draws a rectangular frame around an image or ROI.
DrawFrameWithCurrentPen	Draws a rectangular frame around an image or ROI.

GetImagePtr	Returns a pointer to the pixel at given coordinates within the image/ROI.
GetSubBaseROIs	Returns all the children, and possibly recursively all their children, too.
HasSubROI	Tests whether this object has a given attached ROI.
HitTest	Detects if the cursor is placed over one of the dragging handles.
IsAnROI	Tests whether this object is an ROI or an image.
Load	Restores an image stored in the given file.
Save	Saves the EBaseROI object to the given file.
SaveJpeg	Saves the EBaseROI object to the given file, in JPEG format.
SaveJpeg2K	Saves the EBaseROI object to the given file, in JPEG 2000 format.
SavePng	Saves the EBaseROI object to the given file, in PNG format.
SetImagePtr	Sets the pointer to an externally allocated image buffer.
SetPlacement	Sets the placement of an ROI, relative to its parent ROI/image.
SetSize	Sets the width and height of an ROI/image.

EBaseROI.Attach

This method attaches the ROI to another ROI or image.
Only ROIs can be attached. An image can never be attached to another image or ROI.
Optionally, the ROI can be moved and resized after attachment by supplying additional parameters.

Namespace: Euresys.Open_eVision

[C#]

```
void Attach(
 Euresys.Open_eVision.EBaseROI parent
 )

void Attach(
 Euresys.Open_eVision.EBaseROI parent,
 int orgX,
 int orgY,
 int width,
 int height
 )
```

Parameters

parent
ROI or image on which to attache the ROI.

orgX
When specified, sets the new x-coordinate of the ROI top-left corner.

orgY
When specified, sets the new y-coordinate of the ROI top-left corner.

width
When specified, sets the new width of the ROI.

height
When specified, sets the new height of the ROI.

EBaseROI.Author

Gets or sets the Author attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.

Namespace: Euresys.Open_eVision

[C#]

```
string Author
  { get; set; }
```

EBaseROI.BaseTopParent

Returns the image at the top of the hierarchy, or NULL if there is no image on top.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBaseROI BaseTopParent
  { get; }
```

EBaseROI.BitsPerPixel

Gets the number of storage bits per pixel.

Namespace: Euresys.Open_eVision

[C#]

```
uint BitsPerPixel
  { get; }
```

EBaseROI.ColorSystem

Gets or sets the color system used by this image, as defined by the EColorSystem enumeration.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EColorSystem ColorSystem
  { get; set; }
```

Remarks

Upon object creation, a default color system is set, compatible with the ROI/image type (GrayLevel for gray-level types and Rgb for color types).
The color system associated to an image is mainly relevant when working on color images.
See EasyColor (FG) for more information.

EBaseROI.ColPitch

Gets the pitch of a column (number of bytes between two horizontally adjacent pixels). For BW1 (one bit per pixel) images, this value is undefined.

Namespace: Euresys.Open_eVision

```
[C#]
int ColPitch
  { get; }
```

EBaseROI.Comment

Gets or sets the Comment attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.

Namespace: Euresys.Open_eVision

```
[C#]
string Comment
  { get; set; }
```

EBaseROI.CopyTo

Copies all the data of the current EBaseROI object into another EBaseROI object and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EBaseROI dest
 )
void CopyTo(
 Euresys.Open_eVision.EBaseROI dest
 )
```

Parameters

dest

An EBaseROI object in which the current EBaseROI object data have to be copied.

Remarks

This method copies all the object date to the destination object. The attached ROIs are copied recursively and attached to the destination object. They will be deleted automatically when the the destination object is deleted.
When the buffer of the source image has been provided by a call to SetImagePtr, the pointer will be copied into the destination image. Both images will thus refer the same external buffer. Deprecation notice: The overload taking a pointer is deprecated.

EBaseROI.CropToImage

This method reduces the ROI size so that it is completely contained within its topmost parent image bounds (if such an image exists at the top of the hierarchy). This means that, after calling this method, either the ROI has a zero size, or all of its pixels map to valid pixels of the underlying image buffer. If the ROI is already contained within its parent image bounds, then this method does nothing.

Namespace: Euresys.Open_eVision

[C#]

```
void CropToImage(
 )
```

EBaseROI.Date

Gets or sets the Date attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.

Namespace: Euresys.Open_eVision

[C#]

```
string Date
  { get; set; }
```

EBaseROI.Drag

Moves the specified handle to a new position and updates all placement parameters of the ROI.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 Euresys.Open_eVision.EDragHandle dragHandle,
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

dragHandle

Handle identifier, as defined by EDragHandle. The value returned by EBaseROI::HitTest should be used.

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

If zooming and/or panning were used when drawing the ROI, the same values must be used with EBaseROI::HitTest and EBaseROI::Drag.

EBaseROI.Draw

Draws an ROI/image in a device context.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

c24Vector

When supplied, this parameter allows using a LUT that maps from BW8 to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from BW8 to BW8 when drawing.

Remarks

An ROI/image can be drawn (its pixels rendered) using a device context.
The horizontal and vertical zooming factors can be different and must be contained in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBaseROI.DrawFrame

Draws a rectangular frame around an image or ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawFrame(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EFramePosition framePosition,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawFrame(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawFrame(
 IntPtr graphicContext,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawFrame(
 IntPtr graphicContext,
 Euresys.Open_eVision.EFramePosition framePosition,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawFrame(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

framePosition

Positioning of the frame relative to the ROI.

handles

true if handles are to be drawn.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

Color in which to draw the frame.

Remarks

A frame can be drawn (using a device context) around an image or ROI, possibly with 9 sizing handles.
A suitable default pen is used (see EBaseROI::DrawFrameWithCurrentPen if you wish to use the pen currently selected into the device context).
Zooming and panning are possible. Please note that panning is applied *before* zooming.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBaseROI.DrawFrameWithCurrentPen

This method is deprecated.

Draws a rectangular frame around an image or ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawFrameWithCurrentPen(
 IntPtr graphicContext,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawFrameWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EFramePosition framePosition,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

handles

true if handles are to be drawn.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

framePosition

Positioning of the frame relative to the ROI.

Remarks

A frame can be drawn (using a device context) around an image or ROI, possibly with 9 sizing handles.
The current device context pen is used. Zooming and panning are possible. Please note that panning is applied *before* zooming.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBaseROI.GetImagePtr

Returns a pointer to the pixel at given coordinates within the image/ROI.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr GetImagePtr(
 int x,
 int y
 )

IntPtr GetImagePtr(
 int x,
 int y
 )

IntPtr GetImagePtr(
 )

IntPtr GetImagePtr(
 )
```

Parameters

x

The pixel x-coordinate.

y

The pixel y-coordinate.

Remarks

This methods returns the memory address of the byte that contains the pixel (or address that contains the first byte of the pixel if it is bigger than one byte).
If the pixel coordinates are not specified, the method returns the address of the top-left pixel of the ROI/image.

EBaseROI.GetSubBaseROIs

Returns all the children, and possibly recursively all their children, too.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBaseROI[] GetSubBaseROIs(
 bool recursive
 )
Euresys.Open_eVision.EBaseROI[] GetSubBaseROIs(
 bool recursive
 )
```

Parameters

recursive

true to retrieve all sub-ROIs recursively. false otherwise.

EBaseROI.HasSubROI

Tests whether this object has a given attached ROI.

Namespace: Euresys.Open_eVision

[C#]

```
bool HasSubROI(
 Euresys.Open_eVision.EBaseROI subROI
 )
```

Parameters

subROI

Sub ROI to find.

EBaseROI.Height

Gets or sets the height of the ROI.

Namespace: Euresys.Open_eVision

[C#]

```
int Height
  { get; set; }
```

Remarks

The *placement of an ROI* is given by the coordinates its upper left corner (origin point), relative to its parent ROI/image and by its size (width and height).

EBaseROI.HitTest

Detects if the cursor is placed over one of the dragging handles.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EDragHandle HitTest(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Returns a handle identifier, as defined by EDragHandle.
If zooming and/or panning were used when drawing the ROI, the same values must be used with EBaseROI::HitTest and EBaseROI::Drag.

EBaseROI.IsAnROI

Tests whether this object is an ROI or an image.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsAnROI(
 )
```

EBaseROI.IsVoid

Tests whether if the topmost parent image of this hierarchy has a zero size.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsVoid
   { get; }
```

Remarks

For an image, this method returns true if the image size is zero.
For an ROI, this method returns true if the topmost parent image size is zero or if there is no topmost image.

EBaseROI.Load

Restores an image stored in the given file.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path of the file.

serializer

The ESerializer file-like object that is read from.

Remarks

When loading, an image is resized if need be. On the opposite, an ROI cannot be resized, and the sizes *must* match.
The image contents around the ROI remains unchanged.
If a serializer is used, then the Euresys proprietary file format is expected. This format preserves attributes and sub-ROIs.
See Supported Image File Types for details about supported files.
See Image File Access - Save, Load - for details about file format and compatibility. When loading a color image file into a gray-level image, the conversion equation will depend of the current ERgbStandard set.

EBaseROI.OrgX

Gets or sets the x-coordinate of the upper left corner of the ROI, relative to its parent ROI/image.

Namespace: Euresys.Open_eVision

[C#]

```
int OrgX
  { get; set; }
```

Remarks

The *placement of an ROI* is given by the coordinates its upper left corner (origin point), relative to its parent ROI/image and by its size (width and height).

EBaseROI.OrgY

Gets or sets the y-coordinate of the upper left corner of the ROI, relative to its parent ROI/image.

Namespace: Euresys.Open_eVision

[C#]

```
int OrgY
  { get; set; }
```

Remarks

The *placement of an ROI* is given by the coordinates its upper left corner (origin point), relative to its parent ROI/image and by its size (width and height).

EBaseROI.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBaseROI Parent
  { get; }
```

EBaseROI.PlanesPerPixel

Gets the number of color components in each pixel of the ROI/image.

Namespace: Euresys.Open_eVision

[C#]

```
uint PlanesPerPixel
  { get; }
```

EBaseROI.RowPitch

Gets the pitch of a row (the number of bytes between two vertically adjacent pixels). This is also valid for BW1 images (one bit per pixel).

Namespace: Euresys.Open_eVision

[C#]

```
int RowPitch
  { get; }
```

EBaseROI.Save

Saves the EBaseROI object to the given file.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path,
 Euresys.Open_eVision.EImageFileType type
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path of the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

serializer

The ESerializer file-like object that is written to.

Remarks

By default (if no format is specified), the file format is determined from the file extension.
If a serializer is used, then the Euresys proprietary file format is used. This format preserves attributes and sub-ROIs.
See Supported Image File Types for details about supported files.
See Image File Access - Save, Load - for details about file format and compatibility.

EBaseROI.SaveJpeg

Saves the EBaseROI object to the given file, in JPEG format.

Namespace: Euresys.Open_eVision

[C#]

```
void SaveJpeg(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG quality, between 0 and 100 (100 is best quality). The default value is 75.

Remarks

See Image File Access - Save, Load - for details about file format and quality.

EBaseROI.SaveJpeg2K

Saves the EBaseROI object to the given file, in JPEG 2000 format.

Namespace: Euresys.Open_eVision

```
[C#]
void SaveJpeg2K(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG 2000 quality, between 1 and 512. The default value is 16.

Remarks

See Image File Access - Save, Load - for details about file format and quality.

EBaseROI.SavePng

Saves the EBaseROI object to the given file, in PNG format.

Namespace: Euresys.Open_eVision

```
[C#]
void SavePng(
 string path,
 int compression
 )
```

Parameters

path

The full path of the destination file.

compression

PNG compression, between 1 and 9 (1 is the fastest and 9 is the best compression). The default value is 1.

Remarks

See Image File Access - Save, Load - for details about file format and quality.

EBaseROI.SetImagePtr

Sets the pointer to an externally allocated image buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void SetImagePtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the image.

bitsPerRow

The total number of bits contained in a row, padding included. Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EBaseROI::SetImagePtr.

Remarks

This call is only valid on an image. An ROI gets its buffer from its parent while an image normally allocates a pixel buffer automatically. The pointer to this buffer refers to the top left pixel of the image. The next pixels are stored contiguously, row by row, from top to bottom and from left to right.
Padding at the end of a row may be used, but it must lead to rows that are multiple of 4 bytes. This method overrides the internally allocated image buffer of the EBaseROI.
As long as the image accesses this buffer, it must not be deleted.

EBaseROI.SetPlacement

Sets the placement of an ROI, relative to its parent ROI/image.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPlacement(
 int originX,
 int originY,
 int width,
 int height
 )
```

Parameters

originX

New x-coordinate of the top-left pixel of this ROI.

originY

New y-coordinate of the top-left pixel of this ROI.

width

New ROI width.

height

New ROI height.

Remarks

This method can only be called on ROIs.
The *placement of an ROI* is given by the coordinates its upper left corner (origin point), relative to its parent ROI/image and by its size (width and height).

EBaseROI.SetSize

Sets the width and height of an ROI/image.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSize(
 int width,
 int height
 )

void SetSize(
 Euresys.Open_eVision.EBaseROI other
 )
```

Parameters

width

The new requested ROI/image width.

height

The new requested ROI/image height.

other

The other ROI/image whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new image buffer (deallocate the old image buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new Open eVision image buffer and setting its size creates a 4-byte aligned buffer, by default. The *size of an image* is specified as a number of columns (width) and rows (height).
The maximum image dimensions are 32767 by 32767. Furthermore, it must fit into the available memory, that depends upon the physical memory, the operating system and the memory already allocated by the process in other modules or libraries.
The *placement of an ROI* is given by the x and y coordinates of its upper left pixel relative to its parent image, and also by its width and its height.

EBaseROI.Title

Gets or sets the Title attribute of the ROI/image. This is a convenience property that allows storing some information in the ROI/image. Please note that not all file formats preserve this information.

Namespace: Euresys.Open_eVision

[C#]

```
string Title
  { get; set; }
```

EBaseROI.TotalHeight

Gets the height, in pixels, of the ROI topmost parent.

Namespace: Euresys.Open_eVision

[C#]

```
int TotalHeight
  { get; }
```

Remarks

The *total size* of an ROI is the size of its *topmost* parent.

EBaseROI.TotalOrgX

Gets the x-coordinate of the upper left pixel of the ROI, relative to its topmost parent upper left pixel.

Namespace: Euresys.Open_eVision

[C#]

```
int TotalOrgX
  { get; }
```

Remarks

The *total origin coordinates* of an ROI indicate the position of its upper left pixel relative to the *topmost* parent image.
The total origin coordinates (top-left pixel) of a topmost parent are always (0,0).

EBaseROI.TotalOrgY

Gets the y-coordinate of the upper left pixel of the ROI, relative to its topmost parent upper left pixel.

Namespace: Euresys.Open_eVision

[C#]

```
int TotalOrgY
  { get; }
```

Remarks

The *total origin coordinates* of an ROI indicate the position of its upper left pixel relative to the *topmost* parent.
The total origin coordinates (top-left pixel) of a topmost parent are always (0,0).

EBaseROI.TotalWidth

Gets the width, in pixels, of the ROI topmost parent.

Namespace: Euresys.Open_eVision

[C#]

```
int TotalWidth
  { get; }
```

Remarks

The *total size* of an ROI is the size of its *topmost* parent.

EBaseROI.Type

Gets the ROI/image pixel type, as defined by the EImageType enumeration.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageType Type
  { get; }
```

EBaseROI.Width

Gets or sets the width of the ROI.

Namespace: Euresys.Open_eVision

```
[C#]
int Width
  { get; set; }
```

Remarks

The *placement of an ROI* is given by the coordinates its upper left corner (origin point), relative to its parent ROI/image and by its size (width and height).

4.30. EBinaryImageSegmenter Class

Segments a binary image.

Remarks

This segmenter is applicable to EROIBW1 grayscale images.
It produces coded images with two layers: The Black layer (usually, with index 0) contains the unmasked pixels having a binary value equal to zero; and the White layer (usually, with index 1) contains the remaining unmasked pixels, i.e. unmasked pixels having a binary value equal to one.

Base Class:ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Methods

EBinaryImageSegmenter	-
operator==	Comparison operator.

EBinaryImageSegmenter.EBinaryImageSegmenter

-

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
void EBinaryImageSegmenter(
 Euresys.Open_eVision.Segmenters.ETwoLayersImageSegmenter other
 )
```

Parameters

other

-

EBinaryImageSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
bool operator==(
 Euresys.Open_eVision.Segmenters.EBinaryImageSegmenter other
 )
```

Parameters

other

Other segmenter to compare to.

4.31. EBW16PathVector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EBW16PathVector member, and then add elements one at time at the tail by calling the EBW16PathVector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EBW16PathVector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

Closed	Flag indicating whether the shape built with EasyImage::Contour must be closed or not.
RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
DrawClosedContour	Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.
DrawWithCurrentPen	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
EBW16PathVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EBW16PathVector object into the current EBW16PathVector object
SetElement	Modifies the vector element at the given index by the given value.

EBW16PathVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

[C#]

```
void AddElement(
 Euresys.Open_eVision.EBW16Path element
 )
```

Parameters

element

The element to be added.

EBW16PathVector.Closed

Flag indicating whether the shape built with EasyImage::Contour must be closed or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Closed
  { get; set; }
```

EBW16PathVector.Draw

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPathVectorDrawOption option,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

option

-

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW16PathVector.DrawClosedContour

Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawClosedContour(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EContourMode contourMode,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

contourMode

Contour mode used to get this path vector used to draw the external boundary of the contour.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

EBW16PathVector.DrawWithCurrentPen

This method is deprecated.

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW16PathVector.EBW16PathVector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW16PathVector(
 )
void EBW16PathVector(
 uint maxNumberOfElements
 )
void EBW16PathVector(
 Euresys.Open_eVision.EBW16PathVector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EBW16PathVector object to be copied

EBW16PathVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW16Path GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EBW16PathVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW16PathVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EBW16Path operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EBW16PathVector (excluded) of the element to be accessed.

EBW16PathVector.operator=

Copies all the data from another EBW16PathVector object into the current EBW16PathVector object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW16PathVector operator=(
 Euresys.Open_eVision.EBW16PathVector other
 )
```

Parameters

other

EBW16PathVector object to be copied

EBW16PathVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EBW16PathVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EBW16Path value
 )
```

Parameters

index

Index, between 0 and EBW16PathVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.32. EBW16PixelAccessor Class

Manages a BW16 pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EBW16PixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EBW16PixelAccessor.EBW16PixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW16PixelAccessor(
 Euresys.Open_eVision.EROIBW16 roi
 )
```

Parameters

roi

Pixel source.

EBW16PixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
ushort GetPixel(
 int x,
 int y
 )
```

Parameters

x

Pixel X coordinate.

y

Pixel Y coordinate.

EBW16PixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 ushort value,
 int x,
 int y
 )
```

Parameters

value
Pixel value.

x
Pixel X coordinate.

y
Pixel Y coordinate.

4.33. EBW16Vector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EBW16Vector member, and then add elements one at time at the tail by calling the EBW16Vector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EBW16Vector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws a plot of the vector element values.
DrawWithCurrentPen	Draws a plot of the vector element values.
EBW16Vector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EBW16Vector object into the current EBW16Vector object
SetElement	Modifies the vector element at the given index by the given value.
WeightedMoment	Returns the first order geometric moment (weighted gravity center).

EBW16Vector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 Euresys.Open_eVision.EBW16 element
 )
```

Parameters

element

The element to be added.

EBW16Vector.Draw

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

color

The color in which to draw the overlay.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW16Vector.DrawWithCurrentPen

This method is deprecated.

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW16Vector.EBW16Vector

Constructs a vector.

Namespace: Euresys.Open_eVision

[C#]

```
void EBW16Vector(
 )

void EBW16Vector(
 uint maxNumberOfElements
 )

void EBW16Vector(
 Euresys.Open_eVision.EBW16Vector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EBW16Vector object to be copied

EBW16Vector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW16 GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EBW16Vector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW16Vector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EBW16 operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EBW16Vector (excluded) of the element to be accessed.

EBW16Vector.operator=

Copies all the data from another EBW16Vector object into the current EBW16Vector object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW16Vector operator=(
 Euresys.Open_eVision.EBW16Vector other
 )
```

Parameters

other

EBW16Vector object to be copied

EBW16Vector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr RawDataPtr
```

```
{ get; }
```

EBW16Vector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EBW16 value
 )
```

Parameters

index

Index, between 0 and EBW16Vector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW16Vector.WeightedMoment

Returns the first order geometric moment (weighted gravity center).

Namespace: Euresys.Open_eVision

```
[C#]
float WeightedMoment(
 uint from,
 uint to
 )
```

Parameters

from

First element of the vector portion for which the weighted moment will be calculated. By default, this is the first element of the vector.

to

Last element of the vector portion for which the weighted moment will be calculated. By default, this is the last element of the vector.

4.34. EBW32PixelAccessor Class

Manages a BW32 pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EBW32PixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EBW32PixelAccessor.EBW32PixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW32PixelAccessor(
 Euresys.Open_eVision.EROIBW32 roi
 )
```

Parameters

roi

Pixel source.

EBW32PixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
uint GetPixel(
 int x,
 int y
 )
```

Parameters

x

Pixel X coordinate.

y

Pixel Y coordinate.

EBW32PixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 uint value,
 int x,
 int y
 )
```

Parameters

value

Pixel value.

x

Pixel X coordinate.

y

Pixel Y coordinate.

4.35. EBW32Vector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EBW32Vector member, and then add elements one at time at the tail by calling the EBW32Vector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EBW32Vector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws a plot of the vector element values.
DrawWithCurrentPen	Draws a plot of the vector element values.
EBW32Vector	Constructs a vector.

GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EBW32Vector object into the current EBW32Vector object
SetElement	Modifies the vector element at the given index by the given value.
WeightedMoment	Returns the first order geometric moment (weighted gravity center).

EBW32Vector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

[C#]

```
void AddElement(
 Euresys.Open_eVision.EBW32 element
 )
```

Parameters

element

The element to be added.

EBW32Vector.Draw

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )

void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

color

The color in which to draw the overlay.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW32Vector.DrawWithCurrentPen

This method is deprecated.

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW32Vector.EBW32Vector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW32Vector(
 )
void EBW32Vector(
 uint maxNumberOfElements
 )
void EBW32Vector(
 Euresys.Open_eVision.EBW32Vector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EBW32Vector object to be copied

EBW32Vector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW32 GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EBW32Vector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW32Vector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EBW32 operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EBW32Vector (excluded) of the element to be accessed.

EBW32Vector.operator=

Copies all the data from another EBW32Vector object into the current EBW32Vector object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW32Vector operator=(
 Euresys.Open_eVision.EBW32Vector other
 )
```

Parameters

other

EBW32Vector object to be copied

EBW32Vector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EBW32Vector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EBW32 value
 )
```

Parameters

index

Index, between 0 and EBW32Vector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW32Vector.WeightedMoment

Returns the first order geometric moment (weighted gravity center).

Namespace: Euresys.Open_eVision

```
[C#]
float WeightedMoment(
 uint from,
 uint to
 )
```

Parameters

from

First element of the vector portion for which the weighted moment will be calculated. By default, this is the first element of the vector.

to

Last element of the vector portion for which the weighted moment will be calculated. By default, this is the last element of the vector.

4.36. EBW8PathVector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EBW8PathVector member, and then add elements one at time at the tail by calling the EBW8PathVector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EBW8PathVector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

Closed	Flag indicating whether the shape built with EasyImage::Contour must be closed or not.
RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
DrawClosedContour	Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.

DrawWithCurrentPen	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
EBW8PathVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EBW8PathVector object into the current EBW8PathVector object
SetElement	Modifies the vector element at the given index by the given value.

EBW8PathVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 Euresys.Open_eVision.EBW8Path element
 )
```

Parameters

element

The element to be added.

EBW8PathVector.Closed

Flag indicating whether the shape built with EasyImage::Contour must be closed or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool Closed
  { get; set; }
```

EBW8PathVector.Draw

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPathVectorDrawOption option,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

option

-

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW8PathVector.DrawClosedContour

Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawClosedContour(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EContourMode contourMode,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

contourMode

Contour mode used to get this path vector used to draw the external boundary of the contour.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

EBW8PathVector.DrawWithCurrentPen

This method is deprecated.

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW8PathVector.EBW8PathVector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW8PathVector(
 )
void EBW8PathVector(
 uint maxNumberOfElements
 )
void EBW8PathVector(
 Euresys.Open_eVision.EBW8PathVector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EBW8PathVector object to be copied

EBW8PathVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW8Path GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EBW8PathVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW8PathVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
ref Euresys.Open_eVision.EBW8Path operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EBW8PathVector (excluded) of the element to be accessed.

EBW8PathVector.operator=

Copies all the data from another EBW8PathVector object into the current EBW8PathVector object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW8PathVector operator=(
 Euresys.Open_eVision.EBW8PathVector other
 )
```

Parameters

other

EBW8PathVector object to be copied

EBW8PathVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EBW8PathVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EBW8Path value
 )
```

Parameters

index

Index, between 0 and EBW8PathVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.37. EBW8PixelAccessor Class

Manages a BW8 pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EBW8PixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EBW8PixelAccessor.EBW8PixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW8PixelAccessor(
 Euresys.Open_eVision.EROIBW8 roi
 )
```

Parameters

roi

Pixel source.

EBW8PixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
byte GetPixel(
 int x,
 int y
 )
```

Parameters

x

Pixel X coordinate.

y

Pixel Y coordinate.

EBW8PixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 byte value,
 int x,
 int y
 )
```

Parameters

value
Pixel value.

x
Pixel X coordinate.

y
Pixel Y coordinate.

4.38. EBW8Vector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EBW8Vector member, and then add elements one at time at the tail by calling the EBW8Vector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EBW8Vector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws a plot of the vector element values.
DrawWithCurrentPen	Draws a plot of the vector element values.
EBW8Vector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EBW8Vector object into the current EBW8Vector object
SetElement	Modifies the vector element at the given index by the given value.
WeightedMoment	Returns the first order geometric moment (weighted gravity center).

EBW8Vector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 Euresys.Open_eVision.EBW8 element
 )
```

Parameters

element

The element to be added.

EBW8Vector.Draw

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

color

The color in which to draw the overlay.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW8Vector.DrawWithCurrentPen

This method is deprecated.

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBW8Vector.EBW8Vector

Constructs a vector.

Namespace: Euresys.Open_eVision

[C#]

```
void EBW8Vector(
 )

void EBW8Vector(
 uint maxNumberOfElements
 )

void EBW8Vector(
 Euresys.Open_eVision.EBW8Vector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EBW8Vector object to be copied

EBW8Vector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW8 GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EBW8Vector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW8Vector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EBW8 operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EBW8Vector (excluded) of the element to be accessed.

EBW8Vector.operator=

Copies all the data from another EBW8Vector object into the current EBW8Vector object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW8Vector operator=(
 Euresys.Open_eVision.EBW8Vector other
 )
```

Parameters

other

EBW8Vector object to be copied

EBW8Vector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr RawDataPtr
```

```
{ get; }
```

EBW8Vector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EBW8 value
 )
```

Parameters

index

Index, between 0 and EBW8Vector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBW8Vector.WeightedMoment

Returns the first order geometric moment (weighted gravity center).

Namespace: Euresys.Open_eVision

```
[C#]
float WeightedMoment(
 uint from,
 uint to
 )
```

Parameters

from

First element of the vector portion for which the weighted moment will be calculated. By default, this is the first element of the vector.

to

Last element of the vector portion for which the weighted moment will be calculated. By default, this is the last element of the vector.

4.39. EBWHistogramVector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EBWHistogramVector member, and then add elements one at time at the tail by calling the EBWHistogramVector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EBWHistogramVector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws a plot of the vector element values.
DrawWithCurrentPen	Draws a plot of the vector element values.
EBWHistogramVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EBWHistogramVector object into the current EBWHistogramVector object
SetElement	Modifies the vector element at the given index by the given value.

EBWHistogramVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 uint element
 )
```

Parameters

element

The element to be added.

EBWHistogramVector.Draw

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

color

The color in which to draw the overlay.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBWHistogramVector.DrawWithCurrentPen

This method is deprecated.

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EBWHistogramVector.EBWHistogramVector

Constructs a vector.

Namespace: Euresys.Open_eVision

[C#]

```
void EBWHistogramVector(
 )
void EBWHistogramVector(
 Euresys.Open_eVision.EBWHistogramVector other
 )
void EBWHistogramVector(
 uint maxNumberOfElements
 )
```

Parameters

other

EBWHistogramVector object to be copied

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

EBWHistogramVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
uint GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EBWHistogramVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EBWHistogramVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref uint operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EBWHistogramVector (excluded) of the element to be accessed.

EBWHistogramVector.operator=

Copies all the data from another EBWHistogramVector object into the current EBWHistogramVector object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBWHistogramVector operator=(
 Euresys.Open_eVision.EBWHistogramVector other
 )
```

Parameters

other

EBWHistogramVector object to be copied

EBWHistogramVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EBWHistogramVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 uint value
 )
```

Parameters

index

Index, between 0 and EBWHistogramVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.40. EC15PixelAccessor Class

Manages a C15 pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EC15PixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EC15PixelAccessor.EC15PixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EC15PixelAccessor(
 Euresys.Open_eVision.EROIC15 roi
 )
```

Parameters

roi

Pixel source.

EC15PixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC15 GetPixel(
 int x,
 int y
 )
```

Parameters

x
Pixel X coordinate.

y
Pixel Y coordinate.

EC15PixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC15 value,
 int x,
 int y
 )
```

Parameters

value
Pixel value.

x
Pixel X coordinate.

y
Pixel Y coordinate.

4.41. EC16PixelAccessor Class

Manages a C16 pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EC16PixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EC16PixelAccessor.EC16PixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EC16PixelAccessor(
 Euresys.Open_eVision.EROIC16 roi
 )
```

Parameters

roi

Pixel source.

EC16PixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC16 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Pixel X coordinate.

y

Pixel Y coordinate.

EC16PixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC16 value,
 int x,
 int y
 )
```

Parameters

value
Pixel value.

x
Pixel X coordinate.

y
Pixel Y coordinate.

4.42. EC24APixelAccessor Class

Manages a C24A pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EC24APixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EC24APixelAccessor.EC24APixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EC24APixelAccessor(
 Euresys.Open_eVision.EROIC24A roi
 )
```

Parameters

roi
Pixel source.

EC24APixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EC24A GetPixel(
 int x,
 int y
 )
```

Parameters

x
Pixel X coordinate.

y
Pixel Y coordinate.

EC24APixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPixel(
 Euresys.Open_eVision.EC24A value,
 int x,
 int y
 )
```

Parameters

value
Pixel value.

x
Pixel X coordinate.

y
Pixel Y coordinate.

4.43. EC24PathVector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EC24PathVector member, and then add elements one at time at the tail by calling the EC24PathVector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EC24PathVector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

Closed	Flag indicating whether the shape built with EasyImage::Contour must be closed or not.
RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
DrawClosedContour	Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.
DrawWithCurrentPen	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
EC24PathVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EC24PathVector object into the current EC24PathVector object
SetElement	Modifies the vector element at the given index by the given value.

EC24PathVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

[C#]

```
void AddElement(
 Euresys.Open_eVision.EC24Path element
 )
```

Parameters

element

The element to be added.

EC24PathVector.Closed

Flag indicating whether the shape built with EasyImage::Contour must be closed or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Closed
  { get; set; }
```

EC24PathVector.Draw

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPathVectorDrawOption option,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

option

-

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EC24PathVector.DrawClosedContour

Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawClosedContour(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EContourMode contourMode,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

contourMode

Contour mode used to get this path vector used to draw the external boundary of the contour.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

EC24PathVector.DrawWithCurrentPen

This method is deprecated.

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EC24PathVector.EC24PathVector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EC24PathVector(
 )
void EC24PathVector(
 Euresys.Open_eVision.EC24PathVector other
 )
void EC24PathVector(
 uint maxNumberOfElements
 )
```

Parameters

other

EC24PathVector object to be copied

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

EC24PathVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24Path GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EC24PathVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EC24PathVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
ref Euresys.Open_eVision.EC24Path operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EC24PathVector (excluded) of the element to be accessed.

EC24PathVector.operator=

Copies all the data from another EC24PathVector object into the current EC24PathVector object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24PathVector operator=(
 Euresys.Open_eVision.EC24PathVector other
 )
```

Parameters

other

EC24PathVector object to be copied

EC24PathVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EC24PathVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EC24Path value
 )
```

Parameters

index

Index, between 0 and EC24PathVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.44. EC24PixelAccessor Class

Manages a C24 pixel accessor context.

Namespace: Euresys.Open_eVision

Methods

EC24PixelAccessor	Constructor.
GetPixel	Gets the Pixel at the given coordinates.
SetPixel	Sets the Pixel at the given coordinates.

EC24PixelAccessor.EC24PixelAccessor

Constructor.

Namespace: Euresys.Open_eVision

```
[C#]
void EC24PixelAccessor(
 Euresys.Open_eVision.EROIC24 roi
 )
```

Parameters

roi

Pixel source.

EC24PixelAccessor.GetPixel

Gets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Pixel X coordinate.

y

Pixel Y coordinate.

EC24PixelAccessor.SetPixel

Sets the Pixel at the given coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC24 value,
 int x,
 int y
 )
```

Parameters

value

Pixel value.

x

Pixel X coordinate.

y

Pixel Y coordinate.

4.45. EC24Vector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EC24Vector member, and then add elements one at time at the tail by calling the EC24Vector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EC24Vector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws a plot of the vector element values.
EC24Vector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EC24Vector object into the current EC24Vector object
SetElement	Modifies the vector element at the given index by the given value.

EC24Vector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

[C#]

```
void AddElement(
 Euresys.Open_eVision.EC24 element
 )
```

Parameters

element

The element to be added.

EC24Vector.Draw

Draws a plot of the vector element values.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 float originX,
 float originY,
 Euresys.Open_eVision.ERGBColor color0,
 Euresys.Open_eVision.ERGBColor color1,
 Euresys.Open_eVision.ERGBColor color2
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float width,
 float height,
 Euresys.Open_eVision.ERGBColor color0,
 Euresys.Open_eVision.ERGBColor color1,
 Euresys.Open_eVision.ERGBColor color2
 )
```

```
void Draw(
 IntPtr graphicContext,
 float width,
 float height
 )
void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 float originX,
 float originY,
 Euresys.Open_eVision.ERGBColor color0,
 Euresys.Open_eVision.ERGBColor color1,
 Euresys.Open_eVision.ERGBColor color2
 )
void Draw(
 IntPtr graphicContext,
 float width,
 float height,
 Euresys.Open_eVision.ERGBColor color0,
 Euresys.Open_eVision.ERGBColor color1,
 Euresys.Open_eVision.ERGBColor color2
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

width

Outermost horizontal size, in pixels.

height

Outermost vertical size, in pixels.

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

color0

The color to be used when drawing the curve of the first color component of the vector, as an RGB color. By default, the current pen is used to draw the curve.

color1

The color to be used when drawing the curve of the second color component of the vector, as an RGB color. By default, the current pen is used to draw the curve.

color2

The color to be used when drawing the curve of the third color component of the vector, as an RGB color. By default, the current pen is used to draw the curve.

Remarks

A vector is able to draw itself in a window. The vector plots the element values as a function of the element indices. The drawing appears on a neutral background. In the special case of the EC24Vector, three curves are drawn instead of one, each corresponding to a color component. Three pen objects must be provided to draw the curves with appropriate attributes. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EC24Vector.EC24Vector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EC24Vector(
 )
void EC24Vector(
 uint maxNumberOfElements
 )
void EC24Vector(
 Euresys.Open_eVision.EC24Vector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EC24Vector object to be copied

EC24Vector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24 GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EC24Vector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EC24Vector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
ref Euresys.Open_eVision.EC24 operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EC24Vector (excluded) of the element to be accessed.

EC24Vector.operator=

Copies all the data from another EC24Vector object into the current EC24Vector object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24Vector operator=(
 Euresys.Open_eVision.EC24Vector other
 )
```

Parameters

other

EC24Vector object to be copied

EC24Vector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EC24Vector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EC24 value
 )
```

Parameters

index

Index, between 0 and EC24Vector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.46. ECalibrationGenerator Class

Represents a 3D calibration model generator, a class made to compute calibration models.

Derived Class(es):EObjectBasedCalibrationGenerator

Namespace: Euresys.Open_eVision.Easy3D

4.47. ECalibrationModel Class

Represents a 3D calibration model.

Derived Class (es): EExplicitGeometricCalibrationModelEObjectBasedCalibrationModelEScaleCalibrationModel

Namespace: Euresys.Open_eVision.Easy3D

Properties

Type	Returns the type of calibration model, see ECalibrationType.

Methods

Apply	Applies this model to convert an uncalibrated point to a world position. This method returns a world position.
Create	Factory method from a serializer stream: allocates and reads the calibration model from the given serializer. Returns the corresponding calibration model, must be released by caller.
Save	Saves the calibration model. The given ESerializer must have been created for writing.

ECalibrationModel.Apply

Applies this model to convert an uncalibrated point to a world position.
This method returns a world position.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint Apply(
 Euresys.Open_eVision.Easy3D.E3DPoint uvwPoint
 )
```

Parameters

uvwPoint

The position of a depth map pixel.

ECalibrationModel.Create

Factory method from a serializer stream: allocates and reads the calibration model from the given serializer.
Returns the corresponding calibration model, must be released by caller.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.ECalibrationModel Create(
 string path
 )

Euresys.Open_eVision.Easy3D.ECalibrationModel Create(
 Euresys.Open_eVision.ESerializer file
 )
```

Parameters

path
The file path.

file
A serializer created for reading.

ECalibrationModel.Save

Saves the calibration model. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

ECalibrationModel.Type

Returns the type of calibration model, see ECalibrationType.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
virtual Euresys.Open_eVision.Easy3D.ECalibrationType Type
  { get; }
```

4.48. ECannyEdgeDetector Class

Manages a complete context for the Canny edge detector.

Remarks

The Canny edge detector operates on a grayscale BW8 image and delivers a black-and-white BW8 image where pixels have only 2 possible values: 0 and 255. Pixels corresponding to edges in the source image are set to value 255 in the output image; The other pixels are set to value 0.

Namespace: Euresys.Open_eVision

Properties

HighThreshold	Sets the high hysteresis threshold for a pixel to be considered as an edge.
LowThreshold	Sets the low hysteresis threshold for a pixel to be considered as an edge.
SmoothingScale	The scale of the features of interest.
ThresholdingMode	Sets the mode of the hysteresis thresholding.

Methods

Apply	Apply the Canny edge detector on an image/ROI.
ECannyEdgeDetector	Constructs a ECannyEdgeDetector object initialized to its default values.
ResetSmoothingScale	Prevents the smoothing of the source image by a Gaussian filter.

ECannyEdgeDetector.Apply

Apply the Canny edge detector on an image/ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void Apply(
 Euresys.Open_eVision.EROIBW8 source,
 Euresys.Open_eVision.EROIBW8 result
 )
```

Parameters

source

The source image/ROI.

result

The output image/ROI.

Remarks

The output ROI must have the same size than the input ROI.

ECannyEdgeDetector.ECannyEdgeDetector

Constructs a ECannyEdgeDetector object initialized to its default values.

Namespace: Euresys.Open_eVision

```
[C#]
void ECannyEdgeDetector(
 )
```

ECannyEdgeDetector.HighThreshold

Sets the high hysteresis threshold for a pixel to be considered as an edge.

Namespace: Euresys.Open_eVision

```
[C#]
float HighThreshold
   { get; set; }
```

ECannyEdgeDetector.LowThreshold

Sets the low hysteresis threshold for a pixel to be considered as an edge.

Namespace: Euresys.Open_eVision

```
[C#]
float LowThreshold
   { get; set; }
```

ECannyEdgeDetector.ResetSmoothingScale

Prevents the smoothing of the source image by a Gaussian filter.

Namespace: Euresys.Open_eVision

```
[C#]
void ResetSmoothingScale(
 )
```

Remarks

Calling this method is equivalent to set ECannyEdgeDetector::SmoothingScale to zero. It disables the use of the Gaussian filter.

ECannyEdgeDetector.SmoothingScale

The scale of the features of interest.

Namespace: Euresys.Open_eVision

```
[C#]
float SmoothingScale
  { get; set; }
```

Remarks

This scale corresponds to the standard deviation of the Gaussian filter that is used to smooth the source image before the computation of the gradient, hereby selecting the scale of the features of interest.
If this scale is set to zero, no smoothing is achieved: The gradient is computed directly on the raw source image, speeding up the detector, but making the process much less reliable.

ECannyEdgeDetector.ThresholdingMode

Sets the mode of the hysteresis thresholding.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECannyThresholdingMode ThresholdingMode
  { get; set; }
```

Remarks

If the threshold mode is set to Absolute, the threshold values are interpreted as absolute thresholds. In this case, the thresholds must be strictly positive real values.

If the threshold mode is set to Relative, the thresholds are expressed as a fraction ranging from 0 to 1 of the maximum value of the gradient of the source image.

In either case, the low threshold must be less than the high threshold.

4.49. EChecker Class

This class is deprecated.

Manages a complete context for the inspection tool based on image comparison in EasyOCV.

Namespace: Euresys.Open_eVision

Properties

Average	Global intensity of the mother image.

DarkGray	Gray level in the dark areas of the mother image.
DegreesOfFreedom	Boolean combination of EDegreesOfFreedom members, that indicates which degrees of freedom are to be considered.
Deviation	Global contrast of the mother image.
High	High threshold image for the adaptive segmentation.
HitHandle	Handle currently hit.
HitRoi	ROI currently hit.
LightGray	Gray level in the light areas of the mother image.
Low	Low threshold image for the adaptive segmentation.
Normalize	Current normalization mode.
NumAverageSamples	Number of samples that were accumulated in the "average" phase of the training.
NumDeviationSamples	Number of samples that were accumulated in the "deviation" phase of the training.
PanX	Current horizontal panning value, expressed in pixels, for use in display operations.
PanY	Current vertical panning value, expressed in pixels, for use in display operations.
Registered	Represents the source image, after it has been aligned with the reference image.
RelativeTolerance	Current tolerance factor to be used for threshold image setup.
ToleranceX	Current horizontal search tolerance, in pixels.
ToleranceY	Current vertical search tolerance, in pixels.
ZoomX	Current horizontal zooming factor for use in display operations.
ZoomY	Current vertical zooming factor for use in display operations.

Methods

AddPathName	Adds a single file pathname.
Attach	Associates a source image to a checker context.
BatchLearn	Performs the learning sequence using the specified list of image files.
Drag	Moves the relevant ROI by means of its handle.
Draw	Draws one of the geometric items that define the EChecker tool.
DrawWithCurrentPen	Draws one of the geometric items that define the EChecker tool.
EChecker	Constructs an uninitialized checker context.
EmptyPathNames	Clears the list of file pathnames.
HitTest	Returns true if the cursor is over one of the dragging handles.
Learn	Accumulates a reference image, following a sequence of operations.

Load	Loads the EChecker. The given ESerializer must have been created for reading.
Register	Realigns and normalizes the source image.
Save	Saves the EChecker. The given ESerializer must have been created for writing.
SetPan	Sets the panning value, expressed in pixels, for use in display operations.
SetTolerance	Sets the search margin, i.e. the width and height of the search area surrounding the alignment pattern(s).
SetZoom	Sets the zooming factor for use in display operations.

EChecker.AddPathName

This method is deprecated.

Adds a single file pathname.

Namespace: Euresys.Open_eVision

```
[C#]
void AddPathName(
 string pathName
 )
```

Parameters

pathName

NULL terminated text string containing the file pathname.

EChecker.Attach

This method is deprecated.

Associates a source image to a checker context.

Namespace: Euresys.Open_eVision

```
[C#]
void Attach(
 Euresys.Open_eVision.EROIBW8 source
 )
```

Parameters

source

Pointer to the source image.

Remarks

The source image is used in all consecutive learning/inspection operations.

EChecker.Average

This property is deprecated.

Global intensity of the mother image.

Namespace: Euresys.Open_eVision

```
[C#]
float Average
  { get; }
```

Remarks

Valid in mode Moments only.

EChecker.BatchLearn

This method is deprecated.

Performs the learning sequence using the specified list of image files.

Namespace: Euresys.Open_eVision

```
[C#]
void BatchLearn(
 Euresys.Open_eVision.ELearningMode mode
 )
```

Parameters

mode

RmsDeviation or AbsDeviation, depending on the preferred method of computing the deviations.

EChecker.DarkGray

This property is deprecated.

Gray level in the dark areas of the mother image.

Namespace: Euresys.Open_eVision

```
[C#]
float DarkGray
  { get; set; }
```

Remarks

Valid in mode Threshold only.

EChecker.DegreesOfFreedom

This property is deprecated.

Boolean combination of EDegreesOfFreedom members, that indicates which degrees of freedom are to be considered.

Namespace: Euresys.Open_eVision

[C#]

```
uint DegreesOfFreedom
  { get; set; }
```

EChecker.Deviation

This property is deprecated.

Global contrast of the mother image.

Namespace: Euresys.Open_eVision

[C#]

```
float Deviation
  { get; }
```

Remarks

Valid in mode Moments only.

EChecker.Drag

This method is deprecated.

Moves the relevant ROI by means of its handle.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y
 )
```

Parameters

x

New horizontal cursor position.

y

New vertical cursor position.

EChecker.Draw

This method is deprecated.

Draws one of the geometric items that define the EChecker tool.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Device context of the drawing window.

drawingMode

ROI to be drawn, as defined by EDrawingMode.

handles

true if the dragging handles must be displayed.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EChecker.DrawWithCurrentPen

This method is deprecated.

Draws one of the geometric items that define the EChecker tool.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Device context of the drawing window.

drawingMode

ROI to be drawn, as defined by EDrawingMode.

handles

true if the dragging handles must be displayed.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EChecker.EChecker

This method is deprecated.

Constructs an uninitialized checker context.

Namespace: Euresys.Open_eVision

```
[C#]
void EChecker(
 )
```

EChecker.EmptyPathNames

This method is deprecated.

Clears the list of file pathnames.

Namespace: Euresys.Open_eVision

```
[C#]
void EmptyPathNames(
 )
```

EChecker.High

This property is deprecated.

High threshold image for the adaptive segmentation.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW8 High
  { get; }
```

EChecker.HitHandle

This property is deprecated.

Handle currently hit.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EDragHandle HitHandle
  { get; }
```

EChecker.HitRoi

This property is deprecated.

ROI currently hit.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERoiHit HitRoi
  { get; }
```

EChecker.HitTest

This method is deprecated.

Returns true if the cursor is over one of the dragging handles.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 int x,
 int y
 )
```

Parameters

x

Current horizontal cursor position.

y

Current vertical cursor position.

Remarks

In this case, EChecker::HitRoi returns the name of the ROI that has been hit, and EChecker::HitHandle returns the name of the corresponding handle.

EChecker.Learn

This method is deprecated.

Accumulates a reference image, following a sequence of operations.

Namespace: Euresys.Open_eVision

```
[C#]
void Learn(
 Euresys.Open_eVision.ELearningMode mode
 )
```

Parameters

mode

Current mode of operation in the learning sequence, as defined by ELearningMode.

Remarks

First the model is reset; then the matching patterns are shown; next a series of images is presented to estimate the average gray levels; then a second series of images is presented to estimate the gray-level variations; finally, the threshold images are generated. A typical sequence with three reference images goes as follows: For standard deviation estimationEChecker.Learn(Reset); initializes. EChecker.Register(); realigns and normalizes 1st source image. EChecker.Learn(RmsDeviation); processes 1st image for deviation info. EChecker.Register(); realigns and normalizes 2nd source image. EChecker.Learn (RmsDeviation); processes 2nd image for deviation info. EChecker.Register(); realigns and normalizes 3rd source image. EChecker.Learn(RmsDeviation); processes 3rd image for deviation info. For robust deviation estimationEChecker.Learn(Reset); initializes. EChecker.Register(); realigns and normalizes 1st source image. EChecker.Learn(Average); processes 1st image for average info. EChecker.Register(); realigns and normalizes 2nd source image. EChecker.Learn(Average); processes 2nd image for average info. EChecker.Register(); realigns and normalizes 3rd source image. EChecker.Learn(Average); processes 3rd image for average info. EChecker.Register(); realigns and normalizes 1st source image. EChecker.Learn (RmsDeviation); processes 1st image for deviation info. EChecker.Register(); realigns and normalizes 2nd source image. EChecker.Learn(RmsDeviation); processes 2nd image for deviation info. EChecker.Register(); realigns and normalizes 3rd source image. EChecker.Learn (RmsDeviation); processes 3rd image for deviation info. EChecker.Learn(Ready); computes the threshold images.

EChecker.LightGray

This property is deprecated.

Gray level in the light areas of the mother image.

Namespace: Euresys.Open_eVision

```
[C#]
float LightGray
  { get; set; }
```

Remarks

Valid in mode Threshold only.

EChecker.Load

This method is deprecated.

Loads the EChecker. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
void Load(
 string path
 )
```

Parameters

serializer
The serializer.

path
The file path.

EChecker.Low

This property is deprecated.

Low threshold image for the adaptive segmentation.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW8 Low
  { get; }
```

EChecker.Normalize

This property is deprecated.

Current normalization mode.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ENormalizationMode Normalize
  { get; set; }
```

EChecker.NumAverageSamples

This property is deprecated.

Number of samples that were accumulated in the "average" phase of the training.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumAverageSamples
  { get; }
```

EChecker.NumDeviationSamples

This property is deprecated.

Number of samples that were accumulated in the "deviation" phase of the training.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumDeviationSamples
  { get; }
```

EChecker.PanX

This property is deprecated.

Current horizontal panning value, expressed in pixels, for use in display operations.

Namespace: Euresys.Open_eVision

```
[C#]
float PanX
  { get; }
```

EChecker.PanY

This property is deprecated.

Current vertical panning value, expressed in pixels, for use in display operations.

Namespace: Euresys.Open_eVision

```
[C#]
float PanY
```

```
{ get; }
```

EChecker.Register

This method is deprecated.

Realigns and normalizes the source image.

Namespace: Euresys.Open_eVision

```
[C#]
void Register(
 )
```

Remarks

Only the inspected ROI is processed. The first time this function is called, the current pattern ROI are used to define the search patterns. After registration, public member EChecker::Registered contains the realigned, normalized contents of the inspected ROI.

EChecker.Registered

This property is deprecated.

Represents the source image, after it has been aligned with the reference image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW8 Registered
  { get; }
```

EChecker.RelativeTolerance

This property is deprecated.

Current tolerance factor to be used for threshold image setup.

Namespace: Euresys.Open_eVision

```
[C#]
float RelativeTolerance
  { get; set; }
```

EChecker.Save

This method is deprecated.

Saves the EChecker. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
void Save(
 string path
 )
```

Parameters

serializer

The serializer.

path

The file path.

EChecker.SetPan

This method is deprecated.

Sets the panning value, expressed in pixels, for use in display operations.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPan(
 float panX,
 float panY
 )
```

Parameters

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

EChecker.SetTolerance

This method is deprecated.

Sets the search margin, i.e. the width and height of the search area surrounding the alignment pattern(s).

Namespace: Euresys.Open_eVision

```
[C#]
void SetTolerance(
 uint toleranceX,
 uint toleranceY
 )
```

Parameters

toleranceX

Horizontal search tolerance, in pixels.

toleranceY

Vertical search tolerance, in pixels.

EChecker.SetZoom

This method is deprecated.

Sets the zooming factor for use in display operations.

Namespace: Euresys.Open_eVision

```
[C#]
void SetZoom(
 float zoom
 )
void SetZoom(
 float zoomX,
 float zoomY
 )
```

Parameters

zoom

Magnification factor for zooming in or out in the horizontal and vertical directions (isotropic scaling).

zoomX

Magnification factor for zooming in or out in the horizontal direction.

zoomY

Magnification factor for zooming in or out in the vertical direction.

EChecker.ToleranceX

This property is deprecated.

Current horizontal search tolerance, in pixels.

Namespace: Euresys.Open_eVision

[C#]

```
uint ToleranceX
  { get; }
```

EChecker.ToleranceY

This property is deprecated.

Current vertical search tolerance, in pixels.

Namespace: Euresys.Open_eVision

[C#]

```
uint ToleranceY
  { get; }
```

EChecker.ZoomX

This property is deprecated.

Current horizontal zooming factor for use in display operations.

Namespace: Euresys.Open_eVision

[C#]

```
float ZoomX
  { get; }
```

EChecker.ZoomY

This property is deprecated.

Current vertical zooming factor for use in display operations.

Namespace: Euresys.Open_eVision

[C#]

```
float ZoomY
  { get; }
```

4.50. EChecker2 Class

Manages a complete context for the EChecker2 golden template inspection tool.

Namespace: Euresys.Open_eVision

Properties

FiducialHorizontalTolerance	Horizontal positionning tolerance for fiducials. The fiducials in the training and inspection images will be searched around the position of the fiducial given during the initialization process, with a tolerance in pixels set by this parameter. The default value is 30 pixels.
FiducialMatchingMode	Fiducial matching mode. This setting allow you to select which type of finder is used to locate the fiducials in the training and inspection images. It can either be geometric (as per EasyFind) or area-based (as per EasyMatch). Default: Geometric finder.
FiducialVerticalTolerance	Vertical positionning tolerance for fiducials. The fiducials in the training and inspection images will be searched around the position of the fiducial given during the initialization process, with a tolerance in pixels set by this parameter. The default value is 30 pixels.
HighThresholdImage	High threshold image.
InspectionTolerance	Inspection Tolerance factor. If you need to be more tolerant towards noise, texture or illumination irregularities, raise this value. If you have clean images, low texture and some defects are missed, lower this value. Default value: 4.0
IsInitialized	Application state. Has the checker been initialized.
IsTrained	Application state. Has the checker been trained.
LastRegisteredImage	Represents the last source image, after it has been aligned with the reference image and normalized.
LowThresholdImage	Low threshold image.
NormalizationMode	Normalization mode. This setting allows you to specify if you want to enable normalization, and if yes, which type. Normalization allows the training and inspection processes to automatically correct global illumination differences between the images. Default: Moments based normalization.
TrainingMode	Training mode. The training mode determines which process will be used to build the threshold images used for inspection. EChecker2 has two training modes: A Quick mode, efficent for crude defects and stable images, and a Precise mode, designed for more subtle defects and handling more variability in the images. Default: Precise training mode.

Methods

AddTrainingImageFile	Add Training Image File.
ClearTrainingImageFiles	Clear Training Image Files.
DrawInspectionField	Draws the inspection field overlay.
DrawReferenceInspectionField	Draws the reference inspection field overlay.

DrawReferenceSearchFields	Draws the reference search fields overlay.
EChecker2	Constructs an uninitialized golden template inspection context.
Initialize	Initialize the training process.
Inspect	Inspect.
Load	Load an inspection model
ResetTraining	Reset training. Use this if you want to reset the state of the object without calling EChecker2::Initialize again.
Save	Save the inspection model
Train	Train.
TrainFromImageFiles	Train From Image Files.

EChecker2.AddTrainingImageFile

Add Training Image File.

Namespace: Euresys.Open_eVision

```
[C#]
void AddTrainingImageFile(
 string path
 )
```

Parameters

path

Path to File.

EChecker2.ClearTrainingImageFiles

Clear Training Image Files.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearTrainingImageFiles(
 )
```

EChecker2.DrawInspectionField

Draws the inspection field overlay.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawInspectionField(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawInspectionField(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawInspectionField(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Device context of the drawing window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning factor. By default, no panning occurs.

panY

Vertical panning factor. By default, no panning occurs.

color

Color in which to draw the overlay

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EChecker2.DrawReferenceInspectionField

Draws the reference inspection field overlay.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawReferenceInspectionField(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawReferenceInspectionField(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawReferenceInspectionField(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Device context of the drawing window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning factor. By default, no panning occurs.

panY

Vertical panning factor. By default, no panning occurs.

color

Color in which to draw the overlay

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EChecker2.DrawReferenceSearchFields

Draws the reference search fields overlay.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawReferenceSearchFields(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawReferenceSearchFields(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawReferenceSearchFields(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Device context of the drawing window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning factor. By default, no panning occurs.

panY

Vertical panning factor. By default, no panning occurs.

color

Color in which to draw the overlay

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EChecker2.EChecker2

Constructs an uninitialized golden template inspection context.

Namespace: Euresys.Open_eVision

```
[C#]
void EChecker2(
 )
```

EChecker2.FiducialHorizontalTolerance

Horizontal positionning tolerance for fiducials. The fiducials in the training and inspection images will be searched around the position of the fiducial given during the initialization process, with a tolerance in pixels set by this parameter. The default value is 30 pixels.

Namespace: Euresys.Open_eVision

```
[C#]
int FiducialHorizontalTolerance
   { get; set; }
```

EChecker2.FiducialMatchingMode

Fiducial matching mode. This setting allow you to select which type of finder is used to locate the fiducials in the training and inspection images. It can either be geometric (as per EasyFind) or area-based (as per EasyMatch). Default: Geometric finder.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFiducialMatchingMode FiducialMatchingMode
   { get; set; }
```

EChecker2.FiducialVerticalTolerance

Vertical positionning tolerance for fiducials. The fiducials in the training and inspection images will be searched around the position of the fiducial given during the initialization process, with a tolerance in pixels set by this parameter. The default value is 30 pixels.

Namespace: Euresys.Open_eVision

[C#]

```
int FiducialVerticalTolerance
  { get; set; }
```

EChecker2.HighThresholdImage

High threshold image.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageBW8 HighThresholdImage
  { get; }
```

EChecker2.Initialize

Initialize the training process.

Namespace: Euresys.Open_eVision

[C#]

```
void Initialize(
 Euresys.Open_eVision.EROIBW8 referenceImage,
 Euresys.Open_eVision.ERegion[] fiducialRegions,
 Euresys.Open_eVision.ERegion inspectionRegion
 )
```

Parameters

referenceImage

ROI or Image used as the reference for the training process.

fiducialRegions

Regions of the fiducials used for the registration process.

inspectionRegion

Region used for the inspection process.

EChecker2.Inspect

Inspect.

Namespace: Euresys.Open_eVision

```
[C#]
void Inspect(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ECodedImage2 defects
 )
```

Parameters

roi

ROI or Image to inspect.

defects

List of defects returned by the inspection.

EChecker2.InspectionTolerance

Inspection Tolerance factor. If you need to be more tolerant towards noise, texture or illumination irregularities, raise this value. If you have clean images, low texture and some defects are missed, lower this value. Default value: 4.0

Namespace: Euresys.Open_eVision

```
[C#]
float InspectionTolerance
  { get; set; }
```

EChecker2.IsInitialized

Application state. Has the checker been initialized.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsInitialized
  { get; }
```

EChecker2.IsTrained

Application state. Has the checker been trained.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsTrained
  { get; }
```

EChecker2.LastRegisteredImage

Represents the last source image, after it has been aligned with the reference image and normalized.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageBW8 LastRegisteredImage
  { get; }
```

EChecker2.Load

Load an inspection model

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string file
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

file
File path

serializer
Serializer. Must be in read mode

EChecker2.LowThresholdImage

Low threshold image.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageBW8 LowThresholdImage
  { get; }
```

EChecker2.NormalizationMode

Normalization mode. This setting allows you to specify if you want to enable normalization, and if yes, which type. Normalization allows the training and inspection processes to automatically correct global illumination differences between the images. Default: Moments based normalization.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ENormalizationMode NormalizationMode
  { get; set; }
```

Remarks

If you have consistent illumination between your images, using normalization can prove detrimental, as in that case the defect themselves might be enough to shift the global contrast.

EChecker2.ResetTraining

Reset training. Use this if you want to reset the state of the object without calling EChecker2::Initialize again.

Namespace: Euresys.Open_eVision

[C#]

```
void ResetTraining(
 )
```

EChecker2.Save

Save the inspection model

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
void Save(
 string file
 )
```

Parameters

serializer
Serializer. Must be in write mode

file
File path

EChecker2.Train

Train.

Namespace: Euresys.Open_eVision

```
[C#]
void Train(
 Euresys.Open_eVision.EROIBW8[] rois
 )
```

Parameters

rois
ROI or Images to train on.

EChecker2.TrainFromImageFiles

Train From Image Files.

Namespace: Euresys.Open_eVision

```
[C#]
void TrainFromImageFiles(
 )
```

EChecker2.TrainingMode

Training mode. The training mode determines which process will be used to build the threshold images used for inspection. EChecker2 has two training modes: A Quick mode, efficent for crude defects and stable images, and a Precise mode, designed for more subtle defects and handling more variability in the images. Default: Precise training mode.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETrainingMode TrainingMode
  { get; set; }
```

4.51. ECircle Class

Represents a model of a circle (or arc) in EasyGauge.

Base Class:EFrame

Namespace: Euresys.Open_eVision

Properties

Amplitude	Angular amplitude of the ECircle object.
Apex	Apex point coordinates of a ECircle object.
ApexAngle	Angular position at the apex of a ECircle object.
ArcLength	Circle arc length of a ECircle object.
Diameter	Diameter of a ECircle object.
Direct	Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.
End	End point coordinates of a ECircle object.
EndAngle	Angular position of the end of a ECircle object.
Full	Flag indicating whether the ECircle object is a full circle or not.
Org	Origin point coordinates of a ECircle object.
OrgAngle	Angular position from where the ECircle object extents.
Radius	Radius of a ECircle object.

Methods

CopyTo	Copies all the data of the current ECircle object into another ECircle object and returns it.
Distance	Returns the smallest distance between this ECircle object an another ECircle.
ECircle	Constructs a ECircle object.
GetDistanceBetweenLineAndCircle	Computes the distance between a line and a circle.
GetDistanceBetweenPointAndCircle	Computes the distance between a point and a circle.
GetIntersectionOfCircles	Computes the intersections between two circles. Returns the number of intersections and stores the found intersections in the provided point parameters.
GetIntersectionOfLineAndCircle	Computes the intersections between a line and circle. Returns the number of intersections and stores the found intersections in the provided point parameters.

GetPoint	Returns the coordinates of a particular point specified by its location along the circle arc.
GetProjectionOfPointOnCircle	Computes the projection of a point on a circle.
operator=	Copies all the data from another ECircle object into the current ECircle object
SetFromCenterAndOrigin	Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircle object.
SetFromOriginMiddleEnd	Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircle object.

ECircle.Amplitude

Angular amplitude of the ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
float Amplitude
  { get; set; }
```

Remarks

The default value is 360. A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircle.Apex

Apex point coordinates of a ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Apex
  { get; }
```

ECircle.ApexAngle

Angular position at the apex of a ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
float ApexAngle
  { get; }
```

Remarks

A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircle.ArcLength

Circle arc length of a ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
float ArcLength
  { get; }
```

Remarks

A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance.

ECircle.CopyTo

Copies all the data of the current ECircle object into another ECircle object and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.ECircle other
 )

Euresys.Open_eVision.ECircle CopyTo(
 Euresys.Open_eVision.ECircle other
 )
```

Parameters

other

Pointer to the ECircle object in which the current ECircle object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ECircle object will be created and returned.

ECircle.Diameter

Diameter of a ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
float Diameter
  { get; set; }
```

Remarks

A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. By default, the diameter is 100, which means 100 pixels when the field of view is not calibrated, and 100 physical units in case of a calibrated field of view.

ECircle.Direct

Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.

Namespace: Euresys.Open_eVision

[C#]

```
bool Direct
  { get; }
```

Remarks

true (default) means that angles increase anticlockwisely in a direct coordinate system, and clockwisely in an inverse coordinate system. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards.

ECircle.Distance

Returns the smallest distance between this ECircle object an another ECircle.

Namespace: Euresys.Open_eVision

```
[C#]
float Distance(
 Euresys.Open_eVision.ECircle circle
 )
```

Parameters

circle

The other circle

ECircle.ECircle

Constructs a ECircle object.

Namespace: Euresys.Open_eVision

```
[C#]
void ECircle(
 )

void ECircle(
 Euresys.Open_eVision.EPoint center,
 float diameter,
 float originAngle,
 bool direct
 )

void ECircle(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 bool direct
 )

void ECircle(
 Euresys.Open_eVision.EPoint center,
 float diameter,
 float originAngle,
 float amplitude
 )

void ECircle(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 bool fullCircle
 )

void ECircle(
 Euresys.Open_eVision.ECircle other
 )
```

Parameters

center
Center coordinates of the circle at its nominal position. The default value is (0,0).

diameter
Nominal diameter of the circle. The default value is 100.

originAngle
Nominal angular origin of the circle. The default value is 0.

direct
true (default) means that angles increase anticlockwisely in a direct coordinate system.

origin
Origin point coordinates of the circle.

amplitude
Nominal angular amplitude of the circle. The default value is 360.

middle
Middle point coordinates of the circle.

end
End point coordinates of the circle.

fullCircle
true (default) in case of a full turn circle. If fullCircle is false, origin and end give the circle's amplitude.

other
Another ECircle object to be copied in the new ECircle object.

ECircle.End

End point coordinates of a ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint End
  { get; }
```

ECircle.EndAngle

Angular position of the end of a ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
float EndAngle
  { get; }
```

Remarks

A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircle.Full

Flag indicating whether the ECircle object is a full circle or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Full
  { get; }
```

Remarks

By default (true), the ECircle object is a full circle.

ECircle.GetDistanceBetweenLineAndCircle

Computes the distance between a line and a circle.

Namespace: Euresys.Open_eVision

[C#]

```
float GetDistanceBetweenLineAndCircle(
 Euresys.Open_eVision.ELine line,
 Euresys.Open_eVision.ECircle circle,
 bool limited
 )
```

Parameters

line

The line.

circle

The circle.

limited

Indicates if the line and circle parameters should be considered as infinite lines and full circles or as a segments and arcs.

ECircle.GetDistanceBetweenPointAndCircle

Computes the distance between a point and a circle.

Namespace: Euresys.Open_eVision

```
[C#]
float GetDistanceBetweenPointAndCircle(
 Euresys.Open_eVision.EPoint pt,
 Euresys.Open_eVision.ECircle circle,
 bool limited
 )
```

Parameters

pt

The point.

circle

The circle.

limited

Indicates if the circle parameter should be considered as a full circle or as an arc.

ECircle.GetIntersectionOfCircles

Computes the intersections between two circles. Returns the number of intersections and stores the found intersections in the provided point parameters.

Namespace: Euresys.Open_eVision

```
[C#]
int GetIntersectionOfCircles(
 Euresys.Open_eVision.ECircle circle1,
 Euresys.Open_eVision.ECircle circle2,
 Euresys.Open_eVision.EPoint intersection1,
 Euresys.Open_eVision.EPoint intersection2,
 bool limited
 )
```

Parameters

circle1
The first circle

circle2
The second circle

intersection1
The first intersection

intersection2
The second intersection

limited
Indicates if the circle parameters should be considered as full circles or as arcs.

Remarks

The function returns the number of intersections found. It will return -1 if the two circles are overlapping.

ECircle.GetIntersectionOfLineAndCircle

Computes the intersections between a line and circle. Returns the number of intersections and stores the found intersections in the provided point parameters.

Namespace: Euresys.Open_eVision

[C#]

```
int GetIntersectionOfLineAndCircle(
 Euresys.Open_eVision.ELine line,
 Euresys.Open_eVision.ECircle circle,
 Euresys.Open_eVision.EPoint intersection1,
 Euresys.Open_eVision.EPoint intersection2,
 bool limited
 )
```

Parameters

line
The line

circle
The circle

intersection1
The first intersection

intersection2
The second intersection

limited
Indicates if the line and circle parameters should be considered as infinite lines and full circles or as a segments and arcs.

Remarks

The function returns the number of intersections found.

ECircle.GetPoint

Returns the coordinates of a particular point specified by its location along the circle arc.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 float fraction
 )
```

Parameters

fraction

Point location expressed as a fraction of the circle arc (range [-1, +1]).

ECircle.GetProjectionOfPointOnCircle

Computes the projection of a point on a circle.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetProjectionOfPointOnCircle(
 Euresys.Open_eVision.EPoint pt,
 Euresys.Open_eVision.ECircle circle
 )
```

Parameters

pt

The point.

circle

The circle.

ECircle.operator=

Copies all the data from another ECircle object into the current ECircle object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECircle operator=(
 Euresys.Open_eVision.ECircle other
 )
```

Parameters

other

ECircle object to be copied

ECircle.Org

Origin point coordinates of a ECircle object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Org
  { get; }
```

ECircle.OrgAngle

Angular position from where the ECircle object extents.

Namespace: Euresys.Open_eVision

```
[C#]
float OrgAngle
  { get; }
```

Remarks

A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircle.Radius

Radius of a ECircle object.

Namespace: Euresys.Open_eVision

```
[C#]
float Radius
  { get; set; }
```

Remarks

A ECircle object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. By default, the radius is 50, which means 50 pixels when the field of view is not calibrated, and 50 physical units in case of a calibrated field of view.

ECircle.SetFromCenterAndOrigin

Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromCenterAndOrigin(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 bool direct
 )
```

Parameters

center

Center coordinates of the circle at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the circle.

direct

true (default) means that angles increase anticlockwisely in a direct coordinate system.

ECircle.SetFromOriginMiddleEnd

Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircle object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 bool fullCircle
 )
```

Parameters

origin

Origin of the circle Arc.

middle

Middle of the circle Arc.

end

End of the circle Arc.

fullCircle

true (default) in case of a full turn circle. If fullCircle is false, origin and end give the circle's amplitude.

Remarks

For example, for a calibrated circle centered on the origin with a radius of 1, whose arc length is 180° and origin angle 0°:
Its origin is (1, 0), its middle (0, 1) and its end (-1, 0).

4.52. ECircleGauge Class

Manages a circle fitting gauge.

Base Class:ECircleShape

Namespace: Euresys.Open_eVision

Properties

Active	Sets the flag indicating whether the gauge is active or not.
AverageDistance	Average distance between the sampled points and the fitted model.
Circle	Sets the nominal position (center coordinates), diameter, angular origin and amplitude of the circle fitting gauge according to a known circle.
FilteringThreshold	Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.
HVConstraint	Status of the restriction on the orientation of the point location gauge or model fitting sample paths.
InnerFilteringEnabled	Getter method for the GetInnerFilteringEnabled property. This property is the flag indicating if the inner sampled point filtering is enabled (true), or not.
InnerFilteringThreshold	Sampled point inner filtering threshold.
MeasuredCircle	Information pertaining to the fitted circle.
MinAmplitude	Offset added to the Threshold when a peak is to be detected.
MinArea	Minimum area value.
NumFilteringPasses	Number of filtering passes for a model fitting operation.

NumMeasuredPoints	Number of edge-crossing points along the sample path of the gauge that was inspected with the last call to ECircleGauge::MeasureSample.
NumSamples	Number of sampled points during the model fitting operation.
NumSkipRanges	Number of skip ranges in the gauge after a call to ECircleGauge::AddSkipRange.
NumValidSamples	Number of valid sample points remaining after a model fitting operation.
RectangularSamplingArea	Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.
SamplingStep	Approximate distance between sampled points during a model fitting operation.
Smoothing	Number of pixels used for the low-pass filtering operation.
Thickness	Number of parallel segments used to extract the data profile.
Threshold	Threshold level used to delimit significant peaks in the data profile.
Tolerance	Searching area half thickness of the circle fitting gauge.
TransitionChoice	Transition choice.
TransitionIndex	Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.
TransitionType	Transition type.
Type	Shape type.
Valid	Flag indicating if at least one valid transition has been found.

Methods

AddSkipRange	Adds an item to the set of skip ranges and returns the index of the newly added range.
CopyTo	Copies all the data of the current ECircleGauge object into another ECircleGauge object, and returns it.
DisableInnerFiltering	Disables inner sampled point filtering.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
ECircleGauge	Constructs a circle measurement context.
GetMeasuredPeak	Returns information pertaining to the default derivative peak, along one of the sample paths of the gauge.
GetMeasuredPoint	Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.

GetMinNumFitSamples	Returns the minimum number of samples required for fitting on each side of the shape.
GetSample	Allows to retrieve the sample points found along the circle.
GetSkipRange	Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the ECircleGauge::AddSkipRange method.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Measure	Triggers the point location or the model fitting operation.
MeasureSample	Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.
MeasureWithoutFitting	Triggers the point location without circle fitting operation.
operator=	Copies all the data from another ECircleGauge object into the current ECircleGauge object
Plot	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
PlotWithCurrentPen	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
Process	Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.
RemoveAllSkipRanges	Removes all the skip ranges previously created by a call to ECircleGauge::AddSkipRange.
RemoveSkipRange	After a call to ECircleGauge::AddSkipRange, removes the skip range with the given index.
SetMinNumFitSamples	Sets the minimum number of samples required for fitting on each side of the shape.

ECircleGauge.Active

Sets the flag indicating whether the gauge is active or not.

Namespace: Euresys.Open_eVision

[C#]

```
override bool Active
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying ECircleGauge::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process. By default, the gauge is active (true).

ECircleGauge.AddSkipRange

Adds an item to the set of skip ranges and returns the index of the newly added range.

Namespace: Euresys.Open_eVision

```
[C#]
uint AddSkipRange(
 uint start,
 uint end
 )
```

Parameters

start

Beginning of the skip range.

end

End of the skip range.

Remarks

The samples indices between start and end (including the boundaries) will be discarded during the measurement process.
The ECircleGauge::AddSkipRange method allows to define skip ranges in an ECircleGauge. This means that, at measure time, samples belonging to these ranges will not be taken into account.
A sample may belong to more than one skip range; to be discarded, a sample has to pertain to at least one range. Moreover, the skip ranges are allowed to overlap one another.
The range is allowed to be reversed (i.e. end is not required to be greater than start).
Also, start and end are not required to reference valid indices at the time of the call (i.e. the range may lie outside of the current return value for ECircleGauge::NumSamples).

ECircleGauge.AverageDistance

Average distance between the sampled points and the fitted model.

Namespace: Euresys.Open_eVision

```
[C#]
float AverageDistance
  { get; }
```

Remarks

Irrelevant in case of a point location operation.

ECircleGauge.Circle

Sets the nominal position (center coordinates), diameter, angular origin and amplitude of the circle fitting gauge according to a known circle.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.ECircle Circle
  { get; set; }
```

ECircleGauge.CopyTo

Copies all the data of the current ECircleGauge object into another ECircleGauge object, and returns it.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.ECircleGauge other,
 bool recursive
 )
Euresys.Open_eVision.ECircleGauge CopyTo(
 Euresys.Open_eVision.ECircleGauge other,
 bool recursive
 )
```

Parameters

other

Pointer to the ECircleGauge object in which the current ECircleGauge object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ECircleGauge object will be created and returned.

ECircleGauge.DisableInnerFiltering

Disables inner sampled point filtering.

Namespace: Euresys.Open_eVision

```
[C#]
void DisableInnerFiltering(
 )
```

Remarks

The inner sampled point filtering is activated as soon as the corresponding ECircleGauge::InnerFilteringThreshold is set.

ECircleGauge.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int x,
 int y
 )
```

Parameters

x

Cursor current X coordinate.

y

Cursor current Y coordinate.

ECircleGauge.Draw

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECircleGauge.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECircleGauge.ECircleGauge

Constructs a circle measurement context.

Namespace: Euresys.Open_eVision

```
[C#]
void ECircleGauge(
 )
void ECircleGauge(
 Euresys.Open_eVision.ECircleGauge other
 )
```

Parameters

other

Another ECircleGauge object to be copied in the new ECircleGauge object.

Remarks

With the default constructor, all the parameters are initialized to their respective default values. With the copy constructor, the circle measurement context is based on a pre-existing ECircleGauge object. The gauge children are also copied. Hierarchy copying through a copy constructor is always recursive. To disable this recursion, use instead the ECircleGauge::CopyTo method.

ECircleGauge.FilteringThreshold

Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

Namespace: Euresys.Open_eVision

```
[C#]
float FilteringThreshold
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).

ECircleGauge.GetMeasuredPeak

Returns information pertaining to the default derivative peak, along one of the sample paths of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPeak GetMeasuredPeak(
 uint index
 )
```

Parameters

index

This argument must be left unchanged from its default value, i.e. ~0 (= 0xFFFFFFFF).

Remarks

ECircleGauge::GetMeasuredPeak returns the information about the derivative peak that meets the following two requirements: 1. It lies on the sample path inspected with the last call to ECircleGauge::MeasureSample, and 1. It is associated with the edge-crossing point along the latter sample path that is selected by the transition choice parameter (cf. ECircleGauge::TransitionChoice).

Note. For this method to succeed, it is necessary to previously call ECircleGauge::MeasureSample.

ECircleGauge.GetMeasuredPoint

Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetMeasuredPoint(
 uint index
 )
```

Parameters

index

This argument must be left unchanged from its default value, i.e. ~0 (= 0xFFFFFFFF).

Remarks

These coordinates pertain to the world space; they are expressed in the reference frame to which the current ECircleGauge object belongs. The gauging process uses a list of sample points to find the shape position and size that best fit a given image. These sample points are measured along the sample paths defined by the gauge geometry. ECircleGauge::GetMeasuredPoint returns the coordinates of the sample point that meets the following two requirements: 1. It lies on the sample path inspected with the last call to ECircleGauge::MeasureSample, and 1. Among all the sample points along the latter sample path, it is the one selected by the ECircleGauge::TransitionChoice property.

Note. For this method to succeed, it is necessary to previously call ECircleGauge::MeasureSample.

ECircleGauge.GetMinNumFitSamples

Returns the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void GetMinNumFitSamples(
 out int side0,
 out int side1,
 out int side2,
 out int side3
 )
```

Parameters

side0

Minimum number of samples on the top side of the rectangle.

side1

Minimum number of samples on the left side of the rectangle.

side2

Minimum number of samples on the bottom side of the rectangle.

side3

Minimum number of samples on the right side of the rectangle.

Remarks

Irrelevant in case of a point location operation.

ECircleGauge.GetSample

Allows to retrieve the sample points found along the circle.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetSample(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSample(
 Euresys.Open_eVision.ESamplePoint pt,
 uint index
 )
```

Parameters

pt

EPoint structure to receive the position of the sample point.

index

The sample index

Remarks

The method provides the sample point corresponding to the supplied index. The returned value corresponds to the sample validity.

ECircleGauge.GetSkipRange

Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the ECircleGauge::AddSkipRange method.

Namespace: Euresys.Open_eVision

```
[C#]
void GetSkipRange(
 uint index,
 out uint start,
 out uint end
 )
```

Parameters

index

Index of the skip range.

start

Beginning of the skip range.

end

End of the skip range.

Remarks

Start is guaranteed to be smaller or equal to end.

ECircleGauge.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the daughters gauges handles have to be considered as well.

ECircleGauge.HVConstraint

Status of the restriction on the orientation of the point location gauge or model fitting sample paths.

Namespace: Euresys.Open_eVision

[C#]

```
bool HVConstraint
  { get; set; }
```

Remarks

Sample paths are the point location gauges placed along the model to be fitted.

ECircleGauge.InnerFilteringEnabled

Getter method for the GetInnerFilteringEnabled property. This property is the flag indicating if the inner sampled point filtering is enabled (true), or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool InnerFilteringEnabled
  { get; }
```

Remarks

The inner sampled point filtering is activated as soon as the corresponding ECircleGauge::InnerFilteringThreshold is set. To disable inner filtering, use the ECircleGauge::DisableInnerFiltering method.

ECircleGauge.InnerFilteringThreshold

Sampled point inner filtering threshold.

Namespace: Euresys.Open_eVision

[C#]

```
float InnerFilteringThreshold
  { get; set; }
```

Remarks

If inner filtering is enabled, the sampled points that have been found inside the measured circle are filtered in regard of their distance to it. If this distance is greater than the threshold, the sampled point is set as invalid, and removed from the measure. This distance is in physical units. The inner sampled point filtering is activated as soon as the corresponding threshold is set. To disable inner filtering, use the ECircleGauge::DisableInnerFiltering method.

ECircleGauge.Measure

Triggers the point location or the model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Pointer to the source image.

region

Region to use with the source image.

Remarks

When this method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

ECircleGauge.MeasuredCircle

Information pertaining to the fitted circle.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECircle MeasuredCircle
  { get; }
```

Remarks

Use method EShape::GetFound to get the status of the measurement. ECircleGauge::MeasuredCircle returns a successful fitted circle if EShape::GetFound is true, otherwise it returns the orginal (nominal) circle.

ECircleGauge.MeasureSample

Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint pathIndex
 )
```

```
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint pathIndex
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

pathIndex

Sample path index.

region

Region on which to measure.

Remarks

This method stores its results into a temporary variable inside the ECircleGauge object.

ECircleGauge.MeasureWithoutFitting

Triggers the point location without circle fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Source image.

region

Region on which to measure.

Remarks

This method performs the actual measurement for each transition, but does not perform the circle fitting. This means that individual samples will be available through the ECircleGauge::GetSample method, but the gauge position will not be changed. Please note that the filtering will not be performed in this method, since it relies upon the fitting process. The filtering parameters will thus be unused.

ECircleGauge.MinAmplitude

Offset added to the Threshold when a peak is to be detected.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinAmplitude
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value. To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected. When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

ECircleGauge.MinArea

Minimum area value.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinArea
  { get; set; }
```

Remarks

A transition is detected if its derivative peak reaches Threshold + MinAmplitude value, and then declared valid if the area between the peak curve and the horizontal at level Threshold reaches the MinArea value.

ECircleGauge.NumFilteringPasses

Number of filtering passes for a model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumFilteringPasses
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
During a filtering pass, the points that are too distant from the model are discarded.
During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).
By default (the number of filtering passes is 0), the outliers rejection process is disabled.

ECircleGauge.NumMeasuredPoints

Number of edge-crossing points along the sample path of the gauge that was inspected with the last call to ECircleGauge::MeasureSample.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumMeasuredPoints
  { get; }
```

Remarks

Note. For this method to succeed, it is necessary to previously call ECircleGauge::MeasureSample.

ECircleGauge.NumSamples

Number of sampled points during the model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation.
After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

ECircleGauge.NumSkipRanges

Number of skip ranges in the gauge after a call to ECircleGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumSkipRanges
  { get; }
```

ECircleGauge.NumValidSamples

Number of valid sample points remaining after a model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumValidSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation.
After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

ECircleGauge.operator=

Copies all the data from another ECircleGauge object into the current ECircleGauge object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECircleGauge operator=(
 Euresys.Open_eVision.ECircleGauge other
 )
```

Parameters

other

ECircleGauge object to be copied

ECircleGauge.Plot

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void Plot(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.

height
Height of the plot.

originX
Origin point coordinates of the plot along the X axis.

originY
Origin point coordinates of the plot along the Y axis.

color
The color in which to draw the overlay.

Remarks

The sample path that is taken into considered is the one inspected with the last call to ECircleGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call ECircleGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECircleGauge.PlotWithCurrentPen

This method is deprecated.

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void PlotWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.

height
Height of the plot.

originX
Origin point coordinates of the plot along the X axis.

originY
Origin point coordinates of the plot along the Y axis.

Remarks

The sample path that is taken into considered is the one inspected with the last call to ECircleGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call ECircleGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECircleGauge.Process

Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.

Namespace: Euresys.Open_eVision

[C#]

```
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool daughters
 )
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 bool daughters
 )
```

Parameters

sourceImage

Pointer to the source image.

daughters

Flag indicating whether the daughters shapes inherit of the same behavior.

region

Region to use with the source image.

Remarks

When complex gauging is required, several gauges can be grouped together. Applying Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

ECircleGauge.RectangularSamplingArea

Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.

Namespace: Euresys.Open_eVision

[C#]

```
bool RectangularSamplingArea
  { get; set; }
```

Remarks

By default, this flag is set to true: the sampling area always remains a rectangle. Setting this property is only useful when the thickness transition parameter is greater than 1. In fact, when thickness transition parameter is equal to 1, rectangle and parallelogram reduce to the same segment.

ECircleGauge.RemoveAllSkipRanges

Removes all the skip ranges previously created by a call to ECircleGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveAllSkipRanges(
 )
```

ECircleGauge.RemoveSkipRange

After a call to ECircleGauge::AddSkipRange, removes the skip range with the given index.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveSkipRange(
 uint index
 )
```

Parameters

index

Index of the skip range to remove, as returned by ECircleGauge::AddSkipRange.

ECircleGauge.SamplingStep

Approximate distance between sampled points during a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
float SamplingStep
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
To fit a model, a series of point location operations are performed along the model. The point location gauges spacing is given by the sampling step.
By default, the sampling step is set to 5, which means 5 pixels when the field of view is not calibrated, and 5 physical units in case of a calibrated field of view.
Be aware that if the sampling step is too large, the number of sampled points along the model will not be sufficient enough to accurately locate it.

ECircleGauge.SetMinNumFitSamples

Sets the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void SetMinNumFitSamples(
 int side0,
 int side1,
 int side2,
 int side3
 )
```

Parameters

side0

Required number of samples to correctly fit the circle. The default value is 3. It is the only parameter taken into account.

side1

Not used.

side2

Not used.

side3

Not used.

Remarks

Irrelevant in case of a point location operation. When the ECircleGauge::Measure method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

ECircleGauge.Smoothing

Number of pixels used for the low-pass filtering operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint Smoothing
  { get; set; }
```

Remarks

To reduce the effect of noise, the profile data can be low-pass filtered along the point location gauge direction.

ECircleGauge.Thickness

Number of parallel segments used to extract the data profile.

Namespace: Euresys.Open_eVision

[C#]

```
uint Thickness
  { get; set; }
```

Remarks

To reduce the effect of noise and/or strengthen a transition, several parallel profiles can be accumulated.

ECircleGauge.Threshold

Threshold level used to delimit significant peaks in the data profile.

Namespace: Euresys.Open_eVision

[C#]

```
uint Threshold
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value. To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected. When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

ECircleGauge.Tolerance

Searching area half thickness of the circle fitting gauge.

Namespace: Euresys.Open_eVision

[C#]

```
float Tolerance
  { get; set; }
```

Remarks

A circle fitting gauge is fully defined knowing its nominal position (given by the coordinates of its center), its nominal radius (diameter), the angular position from where it extents, its angular amplitude and its outline tolerance. By default, the searching area thickness of the circle fitting gauge is 20 (2x10), which means 20 pixels when the field of view is not calibrated, and 20 physical units in case of a calibrated field of view.

ECircleGauge.TransitionChoice

Transition choice.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionChoice TransitionChoice
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition. In case of NthFromBegin or NthFromEnd transition choice, set ECircleGauge::TransitionIndex to specify the desired transition. By default, the selected transition corresponds to the one with the largest amplitude (LargestAmplitude).

ECircleGauge.TransitionIndex

Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.

Namespace: Euresys.Open_eVision

```
[C#]
uint TransitionIndex
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition. By default, the first transition is retained (the index value is 0).

ECircleGauge.TransitionType

Transition type.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionType TransitionType
```

```
{ get; set; }
```

Remarks

The type of a transition tells whether it crosses increasing or decreasing gray-level values. This helps discriminate between nearby edges of an object. By default, the searched transition type is indifferently a black to white or a white to black transition (BwOrWb).

ECircleGauge.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

ECircleGauge.Valid

Flag indicating if at least one valid transition has been found.

Namespace: Euresys.Open_eVision

```
[C#]
bool Valid
  { get; }
```

Remarks

A false value means that no measurement has been performed. A true value means that a transition was found along the sample path inspected with the last call to ECircleGauge::MeasureSample, and thus a point has been measured.

4.53. ECircleRegion Class

Manages a complete context for an ERegion shaped like a circle.

Base Class:ERegion

Namespace: Euresys.Open_eVision

Properties

Center	Center of the region
Radius	Radius of the region

Methods

Drag	Moves the specified handle to a new position and updates all placement parameters of the region.
ECircleRegion	Constructs an ECircleRegion context.
HitTest	Detects if the cursor is placed over one of the dragging handles.
Load	Loads the ECircleRegion. The given ESerializer must have been created for reading.
operator!=	Checks if this ECircleRegion instance is not strictly equal to another
operator=	Assignment operator.
operator==	Checks if this ECircleRegion instance is strictly equal to another
Save	Saves the ECircleRegion. The given ESerializer must have been created for writing.
Scale	Creates a new region by scaling the ECircleRegion.
Translate	Creates a new ECircleRegion by translating the ECircleRegion.

ECircleRegion.Center

Center of the region

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

ECircleRegion.Drag

Moves the specified handle to a new position and updates all placement parameters of the region.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x
x-coordinate of the mouse cursor.

y
y-coordinate of the mouse cursor.

zoomX
Horizontal zoom factor. By default, true scale is used.

zoomY
Vertical zoom factor. By default, true scale is used.

panX
Horizontal pan offset. By default, no pan is added.

panY
Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with ECircleRegion::HitTest and ECircleRegion::Drag.

ECircleRegion.ECircleRegion

Constructs an ECircleRegion context.

Namespace: Euresys.Open_eVision

[C#]

```
void ECircleRegion(
 )

void ECircleRegion(
 float centerX,
 float centerY,
 float radius
 )

void ECircleRegion(
 Euresys.Open_eVision.EPoint center,
 float radius
 )

void ECircleRegion(
 Euresys.Open_eVision.EPoint pt1,
 Euresys.Open_eVision.EPoint pt2,
 Euresys.Open_eVision.EPoint pt3
 )

void ECircleRegion(
 Euresys.Open_eVision.ECircle circle
 )

void ECircleRegion(
 Euresys.Open_eVision.ECircleRegion other
 )
```

Parameters

centerX
The abscissa of the center of the ECircleRegion.
centerY
The ordinate of the center of the ECircleRegion.
radius
The radius of the ECircleRegion.
center
The center of the ECircleRegion.
pt1
One of the three points defining the ECircleRegion.
pt2
One of the three points defining the ECircleRegion.
pt3
One of the three points defining the ECircleRegion.
circle
The result of an ECircleGauge object.
other
ECircleRegion context to copy.

Remarks

When defining a ECircleRegion, the resulting radius value must not be 0 else an EError is thrown.
When defining a ECircleRegion, the resulting radius value must be small enough so that the region fit in memory.
When defining a ECircleRegion with three points, they must be non aligned else an EError is thrown.

ECircleRegion.HitTest

Detects if the cursor is placed over one of the dragging handles.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EEditionMode HitTest(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x
x-coordinate of the mouse cursor.

y
y-coordinate of the mouse cursor.

zoomX
Horizontal zoom factor. By default, true scale is used.

zoomY
Vertical zoom factor. By default, true scale is used.

panX
Horizontal pan offset. By default, no pan is added.

panY
Vertical pan offset. By default, no pan is added.

Remarks

Returns a handle identifier, as defined by EEditionMode.
If zooming and/or panning were used when drawing the region, the same values must be used with ECircleRegion::HitTest and ECircleRegion::Drag.

ECircleRegion.Load

Loads the ECircleRegion. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

ECircleRegion.operator!=

Checks if this ECircleRegion instance is not strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.ECircleRegion other
 )
```

Parameters

other

Reference to the other ECircleRegion instance

ECircleRegion.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECircleRegion operator=(
 Euresys.Open_eVision.ECircleRegion other
 )
```

Parameters

other

Reference to the ECircleRegion used for the assignment

ECircleRegion.operator==

Checks if this ECircleRegion instance is strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ECircleRegion other
 )
```

Parameters

other

Reference to the other ECircleRegion instance

ECircleRegion.Radius

Radius of the region

Namespace: Euresys.Open_eVision

[C#]

```
float Radius
  { get; set; }
```

ECircleRegion.Save

Saves the ECircleRegion. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

ECircleRegion.Scale

Creates a new region by scaling the ECircleRegion.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECircleRegion Scale(
 float scale
 )

Euresys.Open_eVision.EEllipseRegion Scale(
 float scaleX,
 float scaleY
 )
```

Parameters

scale
Isotropic scale.
scaleX
Horizontal scale.
scaleY
Vertical scale.

ECircleRegion.Translate

Creates a new ECircleRegion by translating the ECircleRegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECircleRegion Translate(
 float dx,
 float dy
 )
```

Parameters

dx
Horizontal translation in pixel value
dy
Vertical translation in pixel value

4.54. ECircleShape Class

Manages a circle shape.

Base Class:EShape
Derived Class(es):ECircleGauge
Namespace: Euresys.Open_eVision

Properties

Amplitude	Angular amplitude of the ECircleShape object.
Angle	The angle of the frame.
Apex	Apex point coordinates of a ECircleShape object.
ApexAngle	Angular position at the apex of a ECircleShape object.
ArcLength	Circle arc length of a ECircleShape object.
Center	Center point of the shape.
CenterX	Abscissa of the origin point of the shape.

CenterY	Ordinate of the origin point of the shape.
Circle	The circle.
Diameter	Diameter of a ECircleShape object.
Direct	Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.
End	End point coordinates of a ECircleShape object.
EndAngle	Angular position of the end of a ECircleShape object.
Full	Flag indicating whether the ECircleShape object is a full circle or not.
Org	Origin point coordinates of a ECircleShape object.
OrgAngle	Angular position from where the ECircleShape object extents.
Radius	Radius of a ECircleShape object.
Scale	The scale of the frame.
Type	Shape type.

Methods

Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
CopyTo	Copies all the data of the current ECircleShape object into another ECircleShape object, and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
ECircleShape	Constructs a ECircleShape object.
GetPoint	Returns the coordinates of a particular point specified by its location along the circle arc.
HitTest	Checks if there is a handle under the cursor.
operator=	Copies all the data from another ECircleShape object into the current ECircleShape object
SetCenterXY	-
SetFromCenterAndOrigin	Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircleShape object.
SetFromOriginMiddleEnd	Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircleShape object.

ECircleShape.Amplitude

Angular amplitude of the ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
float Amplitude
  { get; set; }
```

Remarks

The default value is 360. A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircleShape.Angle

The angle of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

ECircleShape.Apex

Apex point coordinates of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Apex
  { get; }
```

ECircleShape.ApexAngle

Angular position at the apex of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
float ApexAngle
  { get; }
```

Remarks

A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircleShape.ArcLength

Circle arc length of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
float ArcLength
  { get; }
```

Remarks

A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance.

ECircleShape.Center

Center point of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

ECircleShape.CenterX

Abscissa of the origin point of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

ECircleShape.CenterY

Ordinate of the origin point of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

ECircleShape.Circle

The circle.

Namespace: Euresys.Open_eVision

[C#]

```
virtual Euresys.Open_eVision.ECircle Circle
  { get; set; }
```

ECircleShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

[C#]

```
void Closest(
 )
```

ECircleShape.CopyTo

Copies all the data of the current ECircleShape object into another ECircleShape object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.ECircleShape other,
 bool recursive
 )
Euresys.Open_eVision.ECircleShape CopyTo(
 Euresys.Open_eVision.ECircleShape dest,
 bool bRecursive
 )
```

Parameters

other

Pointer to the ECircleShape object in which the current ECircleShape object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

dest

-

bRecursive

-

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ECircleShape object will be created and returned.

ECircleShape.Diameter

Diameter of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
float Diameter
  { get; set; }
```

Remarks

A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. By default, the diameter is 100, which means 100 pixels when the field of view is not calibrated, and 100 physical units in case of a calibrated field of view.

ECircleShape.Direct

Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.

Namespace: Euresys.Open_eVision

[C#]

```
bool Direct
  { get; }
```

Remarks

true (default) means that angles increase anticlockwisely in a direct coordinate system, and clockwisely in an inverse coordinate system. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards.

ECircleShape.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

-

n32CursorY

-

ECircleShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECircleShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECircleShape.ECircleShape

Constructs a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void ECircleShape(
 Euresys.Open_eVision.ECircleShape other
 )

void ECircleShape(
 )

void ECircleShape(
 Euresys.Open_eVision.EPoint center,
 float diameter,
 float originAngle,
 bool direct
 )

void ECircleShape(
 Euresys.Open_eVision.EPoint center,
 float diameter,
 float originAngle,
 float amplitude
 )

void ECircleShape(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 bool fullCircle
 )

void ECircleShape(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 bool fullCircle
 )
```

Parameters

other
Another ECircleShape object to be copied in the new ECircleShape object.

center
Center coordinates of the circle at its nominal position. The default value is (0,0).

diameter
Nominal diameter of the circle. The default value is 100.

originAngle
Nominal angular origin of the circle. The default value is 0.

direct
true (default) means that angles increase anticlockwisely in a direct coordinate system.

amplitude
Nominal angular amplitude of the circle. The default value is 360.

origin
Origin point coordinates of the circle.

middle
Middle point coordinates of the circle.

end
End point coordinates of the circle.

fullCircle
true (default) in case of a full turn circle. If fullCircle is false, origin and end give the circle's amplitude.

ECircleShape.End

End point coordinates of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint End
  { get; }
```

ECircleShape.EndAngle

Angular position of the end of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
float EndAngle
  { get; }
```

Remarks

A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircleShape.Full

Flag indicating whether the ECircleShape object is a full circle or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Full
  { get; }
```

Remarks

By default (true), the ECircleShape object is a full circle.

ECircleShape.GetPoint

Returns the coordinates of a particular point specified by its location along the circle arc.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetPoint(
 float fraction
 )
```

Parameters

fraction

Point location expressed as a fraction of the circle arc (range [-1, +1]).

ECircleShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

ECircleShape.operator=

Copies all the data from another ECircleShape object into the current ECircleShape object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECircleShape operator=(
 Euresys.Open_eVision.ECircleShape other
 )
```

Parameters

other

ECircleShape object to be copied

ECircleShape.Org

Origin point coordinates of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Org
  { get; }
```

ECircleShape.OrgAngle

Angular position from where the ECircleShape object extents.

Namespace: Euresys.Open_eVision

[C#]

```
float OrgAngle
  { get; }
```

Remarks

A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ECircleShape.Radius

Radius of a ECircleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
float Radius
  { get; set; }
```

Remarks

A ECircleShape object is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), the angular position from where it extents, its angular amplitude, and its outline tolerance. By default, the radius is 50, which means 50 pixels when the field of view is not calibrated, and 50 physical units in case of a calibrated field of view.

ECircleShape.Scale

The scale of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float Scale
  { get; set; }
```

ECircleShape.SetCenterXY

-

Namespace: Euresys.Open_eVision

```
[C#]
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

-

centerY

-

ECircleShape.SetFromCenterAndOrigin

Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircleShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromCenterAndOrigin(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 bool direct
 )
```

Parameters

center

Center coordinates of the circle at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the circle.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system.

ECircleShape.SetFromOriginMiddleEnd

Sets the geometric parameters (nominal position and diameter, angular position and amplitude) of an ECircleShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 bool fullCircle
 )
```

Parameters

origin

Origin point coordinates of the circle.

middle

Middle point coordinates of the circle.

end

End point coordinates of the circle.

fullCircle

true (default) in case of a full turn circle. If fullCircle is false, origin and end give the circle's amplitude.

ECircleShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

4.55. EClassificationDataset Class

EClassificationDataset manages a dataset of images.

A dataset is a collection of images with different types of labeling: labeling for the classification of images, labeling for the segmentation of pixels, and/or labeling for the detection of objects (classification and localization).
The dataset maintains 3 sets of labels for each type of labeling:
- the classification labels that characterize an entire image;
- the segmentation labels that characterize the pixels of an image; and
- the object labels that characterize axis-aligned rectangle region of an image.

The classification and segmentation labels are entirely user defined. The set of segmentation labels will always contain at least the "Background" label representing pixels of the images that have no relevant information for your task (for example, in a defect segmentation application, the "Background" pixels would be the pixels without any defects).

For each type of labeling, an image can either be unlabeled or labeled. When an image in unlabelled for a given type of labeling, the image won't be used for training a deep learning tool that requires this type of labeling.
The image in the dataset can be stored as path to an image file or as an Open eVision image structure. Supported structures are 8-bits monochrome (EImageBW8), 16-bits monochrome (EImageBW16), and 24-bits color (EROIC24, EImageC24).
The dataset associates with each image a region of interest and a mask/don't care area. By default, the region of interest of an image is its full extent and its mask is empty.
A EClassificationDataset object is also responsible for providing tools to do data augmentation. Data augmentation is the process of generating new images on-the-fly by applying affine transformations to those already in the dataset. Data augmentation allows a deep neural network to be invariant to the applied transformation without having to capture and label real world images containing those transformations.

A dataset can contain images with different sizes (with and height of their region of interest). However, the dataset has a default resolution (see EClassificationDataset and EClassificationDataset) that is used by deep learning tools that require the same input image size such as the EClassifier. When the images have different sizes, the default resolution will be the resolution of the region of interest of the first image added to the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AbsoluteMaxOverlap	Absolute maximum overlap between objects in the dataset.
BasePath	Sets the base path for the images specified with a relative path.
Channels	Number of channels of the first image added to the dataset.
EnableDataAugmentation	Enable data augmentation.
EnableHorizontalFlip	Enable horizontal flipping in data augmentation.
EnableVerticalFlip	Enable vertical flipping in data augmentation.

GaussianNoiseMaximumStandardDeviation	The Gaussian noise maximum standard deviation. The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EClassificationDataset::GaussianNoiseMinimumStandardDeviation and EClassificationDataset::GaussianNoiseMaximumStandardDeviation (also called the normal distribution). Its value must be superior or equal to EClassificationDataset::GaussianNoiseMinimumStandardDeviation.
GaussianNoiseMinimumStandardDeviation	The Gaussian noise minimum standard deviation. The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EClassificationDataset::GaussianNoiseMinimumStandardDeviation and EClassificationDataset::GaussianNoiseMaximumStandardDeviation (also called the normal distribution). Its value must be betwteen 0 and EClassificationDataset::GaussianNoiseMaximumStandardDeviation.
Height	Height of the region of interest of the first image added to the dataset.
ImagesIndexesWithNoLabel	Gets a list of index corresponding to the images with no classification labels.
LabeledImagesIndexes	Gets a list of index corresponding to the images that have a classification label.
MaxBrightnessOffset	Maximum absolute brightness offset. Its value must be between 0 and 1.
MaxContrastGain	Maximum contrast gain. Its value must be strictly positive and over EClassificationDataset::MinContrastGain.
MaxGamma	Maximum gamma for gamma correction. Its value must be higher than EClassificationDataset::MinGamma.
MaxHorizontalShear	Maximum absolute horizontal shear. It is represented as an angle from the vertical direction. Its value must be between 0 and 90 degrees.
MaxHorizontalShift	Maximum horizontal shift for data augmentation. The horizontal shift will be between -EClassificationDataset::MaxHorizontalShift and +EClassificationDataset::MaxHorizontalShift.
MaxHueOffset	Maximum absolute hue offset. Its value must be between 0 and 180 degrees.
MaxNumObjectPerImage	Maximum number of objects for an image in the dataset. If no images has object labeling (see EClassificationDataset::HasObjectLabeling), the method returns -1.
MaxRotationAngle	Maximum rotation angle for data augmentation. The rotation angle will be between -EClassificationDataset::MaxRotationAngle and +EClassificationDataset::MaxRotationAngle.
MaxSaturationGain	Maximum saturation gain. Its value must be over or equal to EClassificationDataset::MinSaturationGain.
MaxScale	Maximum scaling allowed for data augmentation.

MaxVerticalShear	Maximum absolute vertical shear. It is represented as an angle from the horizontal direction. Its value must be between 0 and 90 degrees.
MaxVerticalShift	Maximum vertical shift for data augmentation. The vertical shift will be between -EClassificationDataset::MaxHorizontalShift and +EClassificationDataset::MaxHorizontalShift.
MinContrastGain	Minimum contrast gain. Its value must be strictly positive and below EClassificationDataset::MaxContrastGain.
MinGamma	Minimum gamma for gamma correction. Its value must be strictly positive and below EClassificationDataset::MaxGamma.
MinSaturationGain	Minimum saturation gain. Its value must be strictly positive.
MinScale	Minimum scaling allowed for data augmentation.
NumImageFiles	Number of different image files contained in the dataset.
NumImages	Number of images in the dataset.
NumImagesWithForegroundSegments	Number of images that have a ground truth segmentation that has foreground segments and is this not entirely composed of background pixels.
NumImagesWithObjectLabeling	Number of images in the dataset that are labelled for object detection.
NumImagesWithObjects	Number of images in the dataset that are labelled for object detection and have 1 or more objects.
NumImagesWithoutForegroundSegments	Number of images that have a ground truth segmentation that has no foreground segments and is thus entirely composed of background pixels.
NumImagesWithoutObjectLabeling	Number of images in the dataset that are not labelled for object detection.
NumImagesWithoutObjects	Number of images in the dataset that are labelled for object detection but have been associated with no object.
NumImagesWithoutSegmentation	Number of images that doesn't have a ground truth segmentation.
NumImagesWithSegmentation	Number of images that have a ground truth segmentation.
NumLabeledImages	Number of images that have a classification label.
NumLabels	Number of labels in the dataset.
NumObjectLabels	Number of object labels.
NumSegmentationLabels	Number of segmentation labels. A dataset has always at least one segmentation label: "background".
NumUnlabeledImages	Number of images that doesn't have any classification label.
ObjectSize	Object size for EasyLocate Interest point.

SaltAndPepperNoiseMaximumDensity	The maximum density of the salt and pepper noise. The salt and pepper noise sets the value of a number of randomly selected (between EClassificationDataset::SaltAndPepperNoiseMinimumDensity and EClassificationDataset::SaltAndPepperNoiseMaximumDensity) pixels to its minimum or maximum value. Its value must be betwteen EClassificationDataset::SaltAndPepperNoiseMinimumDensity and 1.
SaltAndPepperNoiseMinimumDensity	The minimum density of the salt and pepper noise. The salt and pepper noise sets the value of a number of randomly selected (between EClassificationDataset::SaltAndPepperNoiseMinimumDensity and EClassificationDataset::SaltAndPepperNoiseMaximumDensity) pixels to its minimum or maximum value. Its value must be betwteen 0 and EClassificationDataset::SaltAndPepperNoiseMaximumDensity.
SameLabelMaxOverlap	Maximum overlap between objects with the same label in the dataset.
SpeckleNoiseMaximumStandardDeviation	The speckle noise maximum standard deviation. The speckle noise is a multiplicative noise sampled from a Gamma distribution with a mean of 1 and with its standard deviation between EClassificationDataset::SpeckleNoiseMinimumStandardDeviation and EClassificationDataset::SpeckleNoiseMaximumStandardDeviation. Its value must be strictly higher than EClassificationDataset::SpeckleNoiseMinimumStandardDeviation.
SpeckleNoiseMinimumStandardDeviation	The speckle noise minimum standard deviation. The speckle noise is a multiplicative noise sampled from a Gamma distribution with a mean of 1 and with its standard deviation between EClassificationDataset::SpeckleNoiseMinimumStandardDeviation and EClassificationDataset::SpeckleNoiseMaximumStandardDeviation. Its value must be strictly positive and lower than EClassificationDataset::SpeckleNoiseMaximumStandardDeviation.
Width	Width of the region of interest of the first image added to the dataset.

Methods

AddImage	Adds an image to the dataset. The image can be specified by its path on the filesystem (parameter `imagePath`) or by an Open eVision mage buffer (parameter `img`). By default, an image will have no classification label and no segmentation. The label of the image can be directly specified when adding the image to the dataset. If the given label was not in the classification labels of the dataset, it will be automatically added to them. If no region of interest and/or mask is specified, the region of interest of the image will be its full extent and its mask will be empty. The method returns -1 if there was an error when inserting the image in the dataset or a numeric identifier greater or equal to 0 that can be used to access and manipulate the image in the dataset.
AddImageObject	Adds an object to the image.

AddImages	Adds all the images present in the directory specified by the parameter path and whose filename matches the filter. By default, all the images will have no classification label and no classification. However, a label can be directly specified for all of the images. The method returns the number of images added to the dataset.
AddLabel	Adds a label to the dataset.
AddObjectLabel	Adds an object label.
AddRegionToSegment	Adds a region (see ERegion) to the given segment of an image. If, before this call, the image had no segmentation, the pixels not in the given region will be set to the background segmentation label.
AddSegmentationLabel	Adds a segmentation label. The index of the new segmentation labels is returned by the method.
Clear	Clears the datasets.
EClassificationDataset	Constructs a EClassificationDataset object.
Export	Exports the dataset and its images to the given directory. - A new EClassificationDataset object with relative paths to the images is saved into the given directory. - The exported images will be placed in a sub directory named "Images". By default, the images will be saved under the filename "Image_[id].[ext]" where [id] is the index of the image in the dataset and [ext] is the image extension. If fileType is set to EImageFileType_Auto, [ext] will be the same as the original image. Otherwise, [ext] will be deduced from the specified file type. If keepFilename is set to true, the images will keep their original filename (except for their extensions). In two images have the same filename, an index will be automatically added to avoid nay conflict. A width, height, and number of channels can be optionally specified to reformat all the images in the dataset. Note that, in this case, only the ROI of the image will be exported.
ExtractSplit	Creates a new EClassificationDataset containing only the images of the given split type.
GetAvailableImageAnnotationFormat	Image annotation file formats that are available next to the image file.
GetImageCopy	Gets a copy of the i-th image of the dataset. For the variant where a pointer is returned, the user is responsible for clearing the memory of the returned pointer.
GetImageCopyWithDataAugmentation	Generates a new image from the i-th image of the dataset. For the variant where a pointer is returned, the user is responsible for clearing the memory of the returned pointer.
GetImageLabel	Gets the label of the i-th image of the dataset. An exception is thrown if the image has no classification label.
GetImageNumObjects	Number of objects for the speficied image.
GetImageObject	Gets the specified object for the given image.
GetImageObjects	Gets all the objects of the specified image.

GetImagePath	Gets the path of the i-th image of the dataset. If the image was not given using a path, the method will throw an exception.
GetImages	Gets a copy of all images in the dataset. If data augmentation is enabled, the returned images will be augmented versions of the ones in the dataset. The caller is responsible for clearing the memory allocated for each image.
GetImagesIndexesWithLabel	Gets a list of index corresponding to the images associated with the given label
GetLabel	Gets the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1)
GetLabelWeight	Gets the weight associated to the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1)
GetMask	Gets the mask region/don't care area for the given image. The mask is defined with respect to the region of interest of the image.
GetNumImagesForFile	Get the number of images in the dataset that are associated with the given image file.
GetNumImagesForSegmentationLabel	Number of images containing the given segmentation label.
GetNumImagesWithObjectLabel	Number of images that contain an object with the given label.
GetNumObjectsWithLabel	Number of objects with the given label.
GetNumPixelsForSegmentationLabel	Number of pixels assigned to the given segmentation label.
GetNumSegmentedBlobs	Number of segmented blobs in the image for all non-background labels or for a specific label.
GetObjectLabel	Object label.
GetObjectLabelWeight	Gets the weight of an objet label.
GetRegionForSegment	Gets a region corresponding to the pixels of the given segment.
GetRegionOfInterestHeight	Region of interest height for the specified image.
GetRegionOfInterestOriginX	Region of interest origin abscissa for the specified image.
GetRegionOfInterestOriginY	Region of interest origin ordinate for the specified image.
GetRegionOfInterestWidth	Region of interest width for the specified image.
GetSegmentationLabel	Gets the segmentation label.
GetSegmentationLabelWeight	Gets the segmentation label weights.

GetSegmentationMap	Gets the segmentation map of an image. The segmentation map is a 16-bit EROIBW16 image where the value of each pixel is equal to the corresponding segmentation label index (see EClassificationDataset::GetSegmentationLabel). If an image has no segmentation (EClassificationDataset::HasSegmentation), the getter will throw an excpetion.
GetSplit	Generates a split.
HasForegroundSegments	Whether the image segmentation contains segments that are not background. If the image has no segmentation, this method throws an exception.
HasLabel	Whether an image has a classification label.
HasObjectLabeling	Whether the image is labelled for object detection and use with ELocator.
HasSegmentation	Whether the image has a segmentation.
ImportPascalVOCXMLAnnotations	Imports Pascal VOC XML annotations (for EasyLocate Bounding Box). This method may add new labels to the object labels. The version that do not take an image index attempts to import the annotation from all images currently in the dataset.
ImportYOLOTXTAnnotations	Imports YOLO TXT annotations (for EasyLocate Bounding Box). You need to specify the list of labels associated with the YOLO TXT annotations through an array of string or through a file containing this list. This method may add new labels to the object labels. The version that do not take an image index attempts to import the annotation from all images currently in the dataset.
IsEmbeddedImage	Whether the image is embedded into the dataset and is not a reference towards an image file.
IsImageFile	Whether the image is stored as a file path towards an image.
Load	Loads a classification dataset from disk.
operator=	Assignment operator
RemoveImage	Removes the image at the given index. All annotations (label, segmentation, objects) will be lost.
RemoveImageObject	Removes an object from an image.
RemoveLabel	Removes a label from the dataset. All the images associated with this label will be set to unlabeled (see EClassificationDataset::HasLabel).
RemoveObjectLabel	Removes an object label.
RemoveSegmentationLabel	Remove a segmentation label. This method sets all the pixels in the dataset assigned to this label to the background label.
ResetImageObjectLabeling	Resets the object labeling for the specified image. This sets the image as having been labelled for object detection with no object present in the image.

ResetSegmentation	Resets the segmentation of an image by setting all pixels to background.
Save	Saves a classification dataset to disk, containing the file paths to the images in the dataset and their associated label.
SetImageLabel	Sets the label of images in the dataset.
SetImageObject	Sets the specified object for the given image.
SetLabel	Sets the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1). This operation does not add a new label to the dataset but simply renames an existing label.
SetLabelWeight	Sets the weight associated to the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1). This operation does not add a new label.
SetMask	Sets the mask region/don't care area for the given image. The mask is defined with respect to the region of interest of the image.
SetObjectLabel	Sets an object label.
SetObjectLabelWeight	Sets the weight of an object label.
SetRegionOfInterest	Sets the region of interest for the specified image.
SetSegmentationLabel	Sets the segmentation labels.
SetSegmentationLabelWeight	Sets the segmentation label weight.
SetSegmentationMap	Sets the segmentation map of an image. The segmentation map is a 16-bit EROIBW16 image where the value of each pixel is equal to the corresponding segmentation label index (see EClassificationDataset::GetSegmentationLabel). If an image has no segmentation (EClassificationDataset::HasSegmentation), the getter will throw an excpetion.
SplitDataset	Splits the dataset in two parts to be used for training and validation respectively.
SplitDatasetForLocator	Splits the dataset in two parts for training and validation of a ELocator tool. Images without object labeling are excluded from the split.
SplitDatasetForSegmentation	Splits the dataset in two parts for a supervised segmenter. The two parts are to be used for training and validation respectively.
UnsetImageLabel	Unset the label of the given image of the dataset. After this operation, the given image will have no classification labels.
UnsetImageObjectLabeling	Unsets the object labeling for the specified image. This sets the image as not having been labelled for object detection. This image won't be use for training with a ELocator tool.
UnsetSegmentation	Unsets the segmentation of an image. After this operation, the image will have no segmentation.

EClassificationDataset.AbsoluteMaxOverlap

Absolute maximum overlap between objects in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AbsoluteMaxOverlap
  { get; }
```

EClassificationDataset.AddImage

Adds an image to the dataset.
The image can be specified by its path on the filesystem (parameter `imagePath`) or by an Open eVision mage buffer (parameter `img`).
By default, an image will have no classification label and no segmentation. The label of the image can be directly specified when adding the image to the dataset. If the given label was not in the classification labels of the dataset, it will be automatically added to them.
If no region of interest and/or mask is specified, the region of interest of the image will be its full extent and its mask will be empty.
The method returns -1 if there was an error when inserting the image in the dataset or a numeric identifier greater or equal to 0 that can be used to access and manipulate the image in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int AddImage(
 string imagePath
 )

int AddImage(
 string imagePath,
 string label
 )

int AddImage(
 string imagePath,
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ERegion mask
 )
```

```
int AddImage(
 string imagePath,
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ERegion mask,
 string label
 )
int AddImage(
 Euresys.Open_eVision.EBaseROI img
 )
int AddImage(
 Euresys.Open_eVision.EBaseROI img,
 string label
 )
int AddImage(
 Euresys.Open_eVision.EBaseROI img,
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ERegion mask
 )
int AddImage(
 Euresys.Open_eVision.EBaseROI img,
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ERegion mask,
 string label
 )
```

Parameters

imagePath
: The path to an image

label
: The label

originX
: Region of interest origin abscissa

originY
: Region of interest origin ordinate

width
: Region of interest width

height
: Region of interest height

mask

The mask for the image (with respect to the region of interest)

img

The image

Remarks

When adding Open eVision images (EBaseROI) to a dataset, the dataset will retain a copy of the image.
When specifying an individual region of interest and/or mask, the dataset will retain a copy of these.

EClassificationDataset.AddImageObject

Adds an object to the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void AddImageObject(
 int imageIndex,
 Euresys.Open_eVision.EasyDeepLearning.ELocatorObject obj
 )
void AddImageObject(
 int imageIndex,
 string label,
 Euresys.Open_eVision.ERectangleRegion box
 )
```

Parameters

imageIndex

Index of the image

obj

Object

label

Label of the object

box

Axis-aligned rectangle

Remarks

The image will be marked as labelled for object detection (EClassificationDataset::HasObjectLabeling equals to true) after a call to this method.
If the label of the object does not exist in the object labels of the dataset, the label will be added to the object labels of the dataset.

EClassificationDataset.AddImages

Adds all the images present in the directory specified by the parameter path and whose filename matches the filter.
By default, all the images will have no classification label and no classification. However, a label can be directly specified for all of the images.
The method returns the number of images added to the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int AddImages(
 string filter
 )

int AddImages(
 string filter,
 string label
 )

int AddImages(
 string filter,
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ERegion mask
 )

int AddImages(
 string filter,
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ERegion mask,
 string label
 )
```

Parameters

filter
A glob filter

label
A label.

originX
Region of interest origin abscissa

originY
Region of interest origin ordinate

width
Region of interest width

height

Region of interest height

mask

The mask for the images

Remarks

The filter is a glob pattern. This means the wildcard characters "*" and "?" correspond to "zero or more character" and "a single character" respectively. For example, the filter "*_good_*.png" will match any filename that contains the string "_good_" and has a png extension.

EClassificationDataset.AddLabel

Adds a label to the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddLabel(
 string label
 )
```

Parameters

label

Name of the new label

EClassificationDataset.AddObjectLabel

Adds an object label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddObjectLabel(
 string label,
 float weight
 )
```

Parameters

label

Label to add

weight

Weight of the label

EClassificationDataset.AddRegionToSegment

Adds a region (see ERegion) to the given segment of an image. If, before this call, the image had no segmentation, the pixels not in the given region will be set to the background segmentation label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddRegionToSegment(
 int imageIndex,
 int segmentationLabelIndex,
 Euresys.Open_eVision.ERegion region
 )
void AddRegionToSegment(
 int imageIndex,
 string label,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

imageIndex

Image index

segmentationLabelIndex

Segmentation label index

region

Region to add

label

Segmentation label

EClassificationDataset.AddSegmentationLabel

Adds a segmentation label. The index of the new segmentation labels is returned by the method.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int AddSegmentationLabel(
 string label,
 float labelWeight
 )
```

Parameters

label

Name of the segmentation label

labelWeight

Weight of the segmentation label

EClassificationDataset.BasePath

Sets the base path for the images specified with a relative path.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string BasePath
  { get; set; }
```

Remarks

The base path is not serialized. It must be set after loading a dataset file.

EClassificationDataset.Channels

Number of channels of the first image added to the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint Channels
  { get; }
```

EClassificationDataset.Clear

Clears the datasets.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Clear(
 )
```

EClassificationDataset.EClassificationDataset

Constructs a EClassificationDataset object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void EClassificationDataset(
 )
void EClassificationDataset(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset other
 )
```

Parameters

other

Reference to the EClassificationDataset object that should be copied

EClassificationDataset.EnableDataAugmentation

Enable data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool EnableDataAugmentation
  { get; set; }
```

EClassificationDataset.EnableHorizontalFlip

Enable horizontal flipping in data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool EnableHorizontalFlip
  { get; set; }
```

EClassificationDataset.EnableVerticalFlip

Enable vertical flipping in data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool EnableVerticalFlip
  { get; set; }
```

EClassificationDataset.Export

Exports the dataset and its images to the given directory. - A new EClassificationDataset object with relative paths to the images is saved into the given directory.
- The exported images will be placed in a sub directory named "Images".
By default, the images will be saved under the filename "Image_[id].[ext]" where [id] is the index of the image in the dataset and [ext] is the image extension. If fileType is set to EImageFileType_Auto, [ext] will be the same as the original image. Otherwise, [ext] will be deduced from the specified file type. If keepFilename is set to true, the images will keep their original filename (except for their extensions). In two images have the same filename, an index will be automatically added to avoid nay conflict. A width, height, and number of channels can be optionally specified to reformat all the images in the dataset. Note that, in this case, only the ROI of the image will be exported.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Export(
 string directory,
 Euresys.Open_eVision.EImageFileType fileType,
 int quality
 )

void Export(
 string directory,
 bool keepFilename,
 Euresys.Open_eVision.EImageFileType fileType,
 int quality
 )

void Export(
 string directory,
 int width,
 int height,
 int channels,
 Euresys.Open_eVision.EImageFileType fileType,
 int quality
 )

void Export(
 string directory,
 int width,
 int height,
 int channels,
 bool keepFilenames,
 Euresys.Open_eVision.EImageFileType fileType,
 int quality
 )
```

Parameters

directory

A string containing the full path to the directory.

fileType

File type for the exported file. If EImageFileType_Auto, the same file type as the original image is used.

quality

Quality or compression parameters for EBaseROI::SavePng, EBaseROI::SaveJpeg, or EBaseROI::SaveJpeg2K. A value of -1 means the default value.

keepFilename

Keep the original filename of the images

width

Width of the image.

height

Height of the image.

channels

Number of channels of the image (only 1 and 3 are valid, for grayscale and RGB respectively).

keepFilenames

-

EClassificationDataset.ExtractSplit

Creates a new EClassificationDataset containing only the images of the given split type.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset ExtractSplit(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit split,
 Euresys.Open_eVision.EasyDeepLearning.EDatasetType type
 )
```

Parameters

split

Split

type

Type of the split to extract

EClassificationDataset.GaussianNoiseMaximumStandardDeviation

The Gaussian noise maximum standard deviation.
The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EClassificationDataset::GaussianNoiseMinimumStandardDeviation and EClassificationDataset::GaussianNoiseMaximumStandardDeviation (also called the normal distribution).
Its value must be superior or equal to EClassificationDataset::GaussianNoiseMinimumStandardDeviation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GaussianNoiseMaximumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EClassificationDataset.GaussianNoiseMinimumStandardDeviation

The Gaussian noise minimum standard deviation.
The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EClassificationDataset::GaussianNoiseMinimumStandardDeviation and EClassificationDataset::GaussianNoiseMaximumStandardDeviation (also called the normal distribution).
Its value must be betwteen 0 and EClassificationDataset::GaussianNoiseMaximumStandardDeviation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GaussianNoiseMinimumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EClassificationDataset.GetAvailableImageAnnotationFormat

Image annotation file formats that are available next to the image file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EImageAnnotationFormat
GetAvailableImageAnnotationFormat(
 string imageFile
 )

Euresys.Open_eVision.EasyDeepLearning.EImageAnnotationFormat
GetAvailableImageAnnotationFormat(
 int imgId
 )
```

Parameters

imageFile
Path to an image file

imgId
Index of an image

EClassificationDataset.GetImageCopy

Gets a copy of the i-th image of the dataset. For the variant where a pointer is returned, the user is responsible for clearing the memory of the returned pointer.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EBaseROI GetImageCopy(
 int index
 )

void GetImageCopy(
 int index,
 Euresys.Open_eVision.EBaseROI img
 )
```

Parameters

index
The index of the image.

img
Image object to copy the image into.

EClassificationDataset.GetImageCopyWithDataAugmentation

Generates a new image from the i-th image of the dataset. For the variant where a pointer is returned, the user is responsible for clearing the memory of the returned pointer.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EBaseROI GetImageCopyWithDataAugmentation(
 int index,
 Euresys.Open_eVision.EasyDeepLearning.EDLDataAugmentationType generationType
 )
void GetImageCopyWithDataAugmentation(
 int index,
 Euresys.Open_eVision.EBaseROI img,
 Euresys.Open_eVision.EasyDeepLearning.EDLDataAugmentationType generationType
 )
```

Parameters

index

The index of the image.

generationType

The type of transformation to generate (default: random).

img

Image object to copy the image into.

Remarks

If the data augmentation fails, the method will throw an exception.

EClassificationDataset.GetImageLabel

Gets the label of the i-th image of the dataset. An exception is thrown if the image has no classification label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetImageLabel(
 int index
 )
```

Parameters

index

The index of the image for which to get the label.

EClassificationDataset.GetImageNumObjects

Number of objects for the speficied image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetImageNumObjects(
 int imageIndex
 )
```

Parameters

imageIndex
Index of the image

EClassificationDataset.GetImageObject

Gets the specified object for the given image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ELocatorObject GetImageObject(
 int imageIndex,
 int objectIndex
 )
```

Parameters

imageIndex
Index of the image

objectIndex
Index of the object between 0 and EClassificationDataset::GetImageNumObjects

EClassificationDataset.GetImageObjects

Gets all the objects of the specified image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ELocatorObject[] GetImageObjects(
 int imageIndex
 )
```

Parameters

imageIndex
Index of the image

EClassificationDataset.GetImagePath

Gets the path of the i-th image of the dataset. If the image was not given using a path, the method will throw an exception.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetImagePath(
 int index
 )
```

Parameters

index

The index of the image for which to get the path.

EClassificationDataset.GetImages

Gets a copy of all images in the dataset. If data augmentation is enabled, the returned images will be augmented versions of the ones in the dataset.
The caller is responsible for clearing the memory allocated for each image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EBaseROI[] GetImages(
 )
Euresys.Open_eVision.EBaseROI[] GetImages(
 string label
 )
```

Parameters

label

The label.

EClassificationDataset.GetImagesIndexesWithLabel

Gets a list of index corresponding to the images associated with the given label

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint[] GetImagesIndexesWithLabel(
 string label
 )
```

```
uint[] GetImagesIndexesWithLabel(
 int labelIndex
 )
```

Parameters

label

The label

labelIndex

The index of the label (starting from 0 to EClassificationDataset::NumLabels - 1)

EClassificationDataset.GetLabel

Gets the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1)

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetLabel(
 int i
 )
```

Parameters

i

Label index

EClassificationDataset.GetLabelWeight

Gets the weight associated to the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1)

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetLabelWeight(
 int index
 )
```

Parameters

index

Label index

EClassificationDataset.GetMask

Gets the mask region/don't care area for the given image. The mask is defined with respect to the region of interest of the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ERegion GetMask(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image for which to get the mask region

EClassificationDataset.GetNumImagesForFile

Get the number of images in the dataset that are associated with the given image file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumImagesForFile(
 string filePath
 )
```

Parameters

filePath

-

Remarks

The number of image files can be different than the number of images of the dataset. An image file can correspond to several dataset images (with different ROI).

EClassificationDataset.GetNumImagesForSegmentationLabel

Number of images containing the given segmentation label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumImagesForSegmentationLabel(
 int labelId
 )
int GetNumImagesForSegmentationLabel(
 string label
 )
```

Parameters

labelId

Index of the segmentation label

label

Segmentation label

EClassificationDataset.GetNumImagesWithObjectLabel

Number of images that contain an object with the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumImagesWithObjectLabel(
 int labelIdx
 )
int GetNumImagesWithObjectLabel(
 string label
 )
```

Parameters

labelIdx

Index of the object label.

label

Label.

EClassificationDataset.GetNumObjectsWithLabel

Number of objects with the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.UInt64 GetNumObjectsWithLabel(
 int labelIdx
 )
System.UInt64 GetNumObjectsWithLabel(
 string label
 )
```

Parameters

labelIdx

Index of the object label.

label

Label.

EClassificationDataset.GetNumPixelsForSegmentationLabel

Number of pixels assigned to the given segmentation label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.UInt64 GetNumPixelsForSegmentationLabel(
 int labelId
 )
System.UInt64 GetNumPixelsForSegmentationLabel(
 string label
 )
```

Parameters

labelId

Index of the segmentation label

label

Segmentation label

EClassificationDataset.GetNumSegmentedBlobs

Number of segmented blobs in the image for all non-background labels or for a specific label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumSegmentedBlobs(
 int imageId
 )
int GetNumSegmentedBlobs(
 int imageId,
 string label
 )
int GetNumSegmentedBlobs(
 int imageId,
 int labelId
 )
```

Parameters

imageId
Image index
label
Label
labelId
Label index

Remarks

A segmented blob is a contiguous area assigned to a label different than "Background".

EClassificationDataset.GetObjectLabel

Object label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetObjectLabel(
 int labelIndex
 )
```

Parameters

labelIndex
Index of the object label between 0 and EClassificationDataset::NumObjectLabels

EClassificationDataset.GetObjectLabelWeight

Gets the weight of an objet label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetObjectLabelWeight(
 int labelIndex
 )
float GetObjectLabelWeight(
 string label
 )
```

Parameters

labelIndex
Index of the object label
label
Label

EClassificationDataset.GetRegionForSegment

Gets a region corresponding to the pixels of the given segment.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ERegion GetRegionForSegment(
 int imageIndex,
 int segmentationLabelIndex
 )
Euresys.Open_eVision.ERegion GetRegionForSegment(
 int imageIndex,
 string segmentationLabel
 )
```

Parameters

imageIndex

Image index

segmentationLabelIndex

Segmentation label index

segmentationLabel

Segmentation label

EClassificationDataset.GetRegionOfInterestHeight

Region of interest height for the specified image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetRegionOfInterestHeight(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image.

EClassificationDataset.GetRegionOfInterestOriginX

Region of interest origin abscissa for the specified image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetRegionOfInterestOriginX(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image.

EClassificationDataset.GetRegionOfInterestOriginY

Region of interest origin ordinate for the specified image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetRegionOfInterestOriginY(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image.

EClassificationDataset.GetRegionOfInterestWidth

Region of interest width for the specified image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetRegionOfInterestWidth(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image.

EClassificationDataset.GetSegmentationLabel

Gets the segmentation label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetSegmentationLabel(
 int index
 )
```

Parameters

index

Index of the segmentation label

Remarks

The segmentation label index 0 is reserved and corresponds to the "background" label. This segmentation label can't be changed.

EClassificationDataset.GetSegmentationLabelWeight

Gets the segmentation label weights.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetSegmentationLabelWeight(
 int index
 )

float GetSegmentationLabelWeight(
 string label
 )
```

Parameters

index

Index of the segmentation label

label

Segmentation label

EClassificationDataset.GetSegmentationMap

Gets the segmentation map of an image. The segmentation map is a 16-bit EROIBW16 image where the value of each pixel is equal to the corresponding segmentation label index (see EClassificationDataset::GetSegmentationLabel).
If an image has no segmentation (EClassificationDataset::HasSegmentation), the getter will throw an excpetion.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EImageBW16 GetSegmentationMap(
 int imageIndex
 )
```

Parameters

imageIndex

Image index

EClassificationDataset.GetSplit

Generates a split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit GetSplit(
 float trainingProportion,
 float validationPropotion,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType toolType,
 string goodLabel
 )

Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit GetSplit(
 float trainingProportion,
 float validationPropotion,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType toolType,
 string goodLabel,
 uint seed
 )

Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit GetSplit(
 int numTrainingImages,
 int numValidationImages,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType toolType,
 string goodLabel
 )

Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit GetSplit(
 int numTrainingImages,
 int numValidationImages,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType toolType,
 string goodLabel,
 uint seed
 )
```

Parameters

trainingProportion
Approximate proportion of training images

validationPropotion
Approximate proportion of validation images

toolType
Tool type for which to generate the split

goodLabel
The good label for EasySegment Unsupervised split

seed
Seed for randomization

numTrainingImages
Number of training images

numValidationImages
Number of validation images

EClassificationDataset.HasForegroundSegments

Whether the image segmentation contains segments that are not background. If the image has no segmentation, this method throws an exception.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasForegroundSegments(
 int imageId
 )
```

Parameters

imageId
Image index

EClassificationDataset.HasLabel

Whether an image has a classification label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasLabel(
 int index
 )
```

Parameters

index
Index of an image.

EClassificationDataset.HasObjectLabeling

Whether the image is labelled for object detection and use with ELocator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasObjectLabeling(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image

EClassificationDataset.HasSegmentation

Whether the image has a segmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasSegmentation(
 int imageId
 )
```

Parameters

imageId

Image index

EClassificationDataset.Height

Height of the region of interest of the first image added to the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Height
  { get; }
```

EClassificationDataset.ImagesIndexesWithNoLabel

Gets a list of index corresponding to the images with no classification labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int[] ImagesIndexesWithNoLabel
  { get; }
```

EClassificationDataset.ImportPascalVOCXMLAnnotations

Imports Pascal VOC XML annotations (for EasyLocate Bounding Box).
This method may add new labels to the object labels.
The version that do not take an image index attempts to import the annotation from all images currently in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ImportPascalVOCXMLAnnotations(
 int imgId
 )

void ImportPascalVOCXMLAnnotations(
 )
```

Parameters

imgId

The image index for which to import the annotation

EClassificationDataset.ImportYOLOTXTAnnotations

Imports YOLO TXT annotations (for EasyLocate Bounding Box).
You need to specify the list of labels associated with the YOLO TXT annotations through an array of string or through a file containing this list. This method may add new labels to the object labels.
The version that do not take an image index attempts to import the annotation from all images currently in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ImportYOLOTXTAnnotations(
 int imgId,
 string labelFile
 )

void ImportYOLOTXTAnnotations(
 string labelFile
 )
```

Parameters

imgId

The image index for which to import the annotation

labelFile

Path to a file containing the label list

EClassificationDataset.IsEmbeddedImage

Whether the image is embedded into the dataset and is not a reference towards an image file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsEmbeddedImage(
 int index
 )
```

Parameters

index

Index of the image.

EClassificationDataset.IsImageFile

Whether the image is stored as a file path towards an image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsImageFile(
 int index
 )
```

Parameters

index

Index of the image.

EClassificationDataset.LabeledImagesIndexes

Gets a list of index corresponding to the images that have a classification label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int[] LabeledImagesIndexes
  { get; }
```

EClassificationDataset.Load

Loads a classification dataset from disk.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

A string containing the full path to the dataset file.

serializer

The serializer.

EClassificationDataset.MaxBrightnessOffset

Maximum absolute brightness offset. Its value must be between 0 and 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxBrightnessOffset
  { get; set; }
```

Remarks

Brightness transformation is performed by adding a value taken between -EClassificationDataset::MaxBrightnessOffset and +EClassificationDataset::MaxBrightnessOffset to each pixel of the normalized image.

EClassificationDataset.MaxContrastGain

Maximum contrast gain. Its value must be strictly positive and over EClassificationDataset::MinContrastGain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxContrastGain
  { get; set; }
```

Remarks

Contrast transformation is performed by multiplying each mean-centered pixel value by a gain value taken between EClassificationDataset::MinContrastGain and EClassificationDataset::MaxContrastGain. A contrast transformation does not change the overall brightness of an image.

EClassificationDataset.MaxGamma

Maximum gamma for gamma correction. Its value must be higher than EClassificationDataset::MinGamma.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxGamma
  { get; set; }
```

Remarks

Gamma correction transformation is performed by raising each normalized pixel value to the power of gamma with gamma taken between EClassificationDataset::MinGamma and EClassificationDataset::MaxGamma.

EClassificationDataset.MaxHorizontalShear

Maximum absolute horizontal shear.
It is represented as an angle from the vertical direction. Its value must be between 0 and 90 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxHorizontalShear
  { get; set; }
```

EClassificationDataset.MaxHorizontalShift

Maximum horizontal shift for data augmentation.
The horizontal shift will be between -EClassificationDataset::MaxHorizontalShift and +EClassificationDataset::MaxHorizontalShift.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int MaxHorizontalShift
  { get; set; }
```

EClassificationDataset.MaxHueOffset

Maximum absolute hue offset. Its value must be between 0 and 180 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float MaxHueOffset
  { get; set; }
```

Remarks

The hue is represented as an angle between 0 and 360 degrees. The hue transformation is performed by rotating the hue of each pixel by a value between -EClassificationDataset::MaxHueOffset and +EClassificationDataset::MaxHueOffset. This transformation only works for color images.

EClassificationDataset.MaxNumObjectPerImage

Maximum number of objects for an image in the dataset. If no images has object labeling (see EClassificationDataset::HasObjectLabeling), the method returns -1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int MaxNumObjectPerImage
  { get; }
```

EClassificationDataset.MaxRotationAngle

Maximum rotation angle for data augmentation.
The rotation angle will be between -EClassificationDataset::MaxRotationAngle and +EClassificationDataset::MaxRotationAngle.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float MaxRotationAngle
  { get; set; }
```

EClassificationDataset.MaxSaturationGain

Maximum saturation gain. Its value must be over or equal to EClassificationDataset::MinSaturationGain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxSaturationGain
  { get; set; }
```

Remarks

The saturation transformation is performed by multiplying the saturation of each pixel by a value between EClassificationDataset::MinSaturationGain and EClassificationDataset::MaxSaturationGain.

EClassificationDataset.MaxScale

Maximum scaling allowed for data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxScale
  { get; set; }
```

EClassificationDataset.MaxVerticalShear

Maximum absolute vertical shear.
It is represented as an angle from the horizontal direction. Its value must be between 0 and 90 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxVerticalShear
  { get; set; }
```

EClassificationDataset.MaxVerticalShift

Maximum vertical shift for data augmentation.
The vertical shift will be between -EClassificationDataset::MaxHorizontalShift and +EClassificationDataset::MaxHorizontalShift.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int MaxVerticalShift
  { get; set; }
```

EClassificationDataset.MinContrastGain

Minimum contrast gain. Its value must be strictly positive and below EClassificationDataset::MaxContrastGain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinContrastGain
  { get; set; }
```

Remarks

Contrast transformation is performed by multiplying each mean-centered pixel value by a gain value taken between EClassificationDataset::MinContrastGain and EClassificationDataset::MaxContrastGain. A contrast transformation does not change the overall brightness of an image.

EClassificationDataset.MinGamma

Minimum gamma for gamma correction. Its value must be strictly positive and below EClassificationDataset::MaxGamma.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinGamma
  { get; set; }
```

Remarks

Gamma correction transformation is performed by raising each normalized pixel value to the power of gamma with gamma taken between EClassificationDataset::MinGamma and EClassificationDataset::MaxGamma.

EClassificationDataset.MinSaturationGain

Minimum saturation gain. Its value must be strictly positive.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinSaturationGain
  { get; set; }
```

Remarks

The saturation transformation is performed by multiplying the saturation of each pixel by a value between EClassificationDataset::MinSaturationGain and EClassificationDataset::MaxSaturationGain.

EClassificationDataset.MinScale

Minimum scaling allowed for data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinScale
  { get; set; }
```

EClassificationDataset.NumImageFiles

Number of different image files contained in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImageFiles
  { get; }
```

Remarks

The number of image files can be different than the number of images of the dataset. An image file can correspond to several dataset images (with different ROI).

EClassificationDataset.NumImages

Number of images in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImages
  { get; }
```

EClassificationDataset.NumImagesWithForegroundSegments

Number of images that have a ground truth segmentation that has foreground segments and is this not entirely composed of background pixels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithForegroundSegments
  { get; }
```

EClassificationDataset.NumImagesWithObjectLabeling

Number of images in the dataset that are labelled for object detection.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithObjectLabeling
  { get; }
```

EClassificationDataset.NumImagesWithObjects

Number of images in the dataset that are labelled for object detection and have 1 or more objects.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithObjects
  { get; }
```

EClassificationDataset.NumImagesWithoutForegroundSegments

Number of images that have a ground truth segmentation that has no foreground segments and is thus entirely composed of background pixels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithoutForegroundSegments
  { get; }
```

EClassificationDataset.NumImagesWithoutObjectLabeling

Number of images in the dataset that are not labelled for object detection.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithoutObjectLabeling
  { get; }
```

EClassificationDataset.NumImagesWithoutObjects

Number of images in the dataset that are labelled for object detection but have been associated with no object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithoutObjects
  { get; }
```

EClassificationDataset.NumImagesWithoutSegmentation

Number of images that doesn't have a ground truth segmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithoutSegmentation
  { get; }
```

EClassificationDataset.NumImagesWithSegmentation

Number of images that have a ground truth segmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesWithSegmentation
  { get; }
```

EClassificationDataset.NumLabeledImages

Number of images that have a classification label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLabeledImages
  { get; }
```

EClassificationDataset.NumLabels

Number of labels in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLabels
  { get; }
```

EClassificationDataset.NumObjectLabels

Number of object labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumObjectLabels
  { get; }
```

EClassificationDataset.NumSegmentationLabels

Number of segmentation labels. A dataset has always at least one segmentation label: "background".

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumSegmentationLabels
  { get; }
```

EClassificationDataset.NumUnlabeledImages

Number of images that doesn't have any classification label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumUnlabeledImages
  { get; }
```

EClassificationDataset.ObjectSize

Object size for EasyLocate Interest point.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int ObjectSize
  { get; set; }
```

EClassificationDataset.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset operator=(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset other
 )
```

Parameters

other

Reference to the EClassificationDataset object used for the assignment

EClassificationDataset.RemoveImage

Removes the image at the given index. All annotations (label, segmentation, objects) will be lost.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void RemoveImage(
 int imgId
 )
```

Parameters

imgId

Index of the image to remove

EClassificationDataset.RemoveImageObject

Removes an object from an image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveImageObject(
 int imageIndex,
 int objectIndex
 )
```

Parameters

imageIndex
Index of the image

objectIndex
Index of the object between 0 and EClassificationDataset::GetImageNumObjects

EClassificationDataset.RemoveLabel

Removes a label from the dataset.
All the images associated with this label will be set to unlabeled (see EClassificationDataset::HasLabel).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveLabel(
 string label
 )
void RemoveLabel(
 int labelId
 )
```

Parameters

label
Name of the label to remove

labelId
Index of the label to remove

EClassificationDataset.RemoveObjectLabel

Removes an object label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveObjectLabel(
 int labelIndex
 )
```

```
void RemoveObjectLabel(
 string label
 )
```

Parameters

labelIndex

Index of the object label to remove

label

Label to remove

EClassificationDataset.RemoveSegmentationLabel

Remove a segmentation label.
This method sets all the pixels in the dataset assigned to this label to the background label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void RemoveSegmentationLabel(
 string label
 )

void RemoveSegmentationLabel(
 int index
 )
```

Parameters

label

Name of the segmentation label to remove

index

Index of the segmentation label to remove

EClassificationDataset.ResetImageObjectLabeling

Resets the object labeling for the specified image. This sets the image as having been labelled for object detection with no object present in the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ResetImageObjectLabeling(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image

EClassificationDataset.ResetSegmentation

Resets the segmentation of an image by setting all pixels to background.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void ResetSegmentation(
 int imageIndex
 )
```

Parameters

imageIndex

Image index

EClassificationDataset.SaltAndPepperNoiseMaximumDensity

The maximum density of the salt and pepper noise.
The salt and pepper noise sets the value of a number of randomly selected (between EClassificationDataset::SaltAndPepperNoiseMinimumDensity and EClassificationDataset::SaltAndPepperNoiseMaximumDensity) pixels to its minimum or maximum value.
Its value must be betwteen EClassificationDataset::SaltAndPepperNoiseMinimumDensity and 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SaltAndPepperNoiseMaximumDensity
  { get; set; }
```

Remarks

This noise is computed after all the other noises.

EClassificationDataset.SaltAndPepperNoiseMinimumDensity

The minimum density of the salt and pepper noise.
The salt and pepper noise sets the value of a number of randomly selected (between EClassificationDataset::SaltAndPepperNoiseMinimumDensity and EClassificationDataset::SaltAndPepperNoiseMaximumDensity) pixels to its minimum or maximum value.
Its value must be betwteen 0 and EClassificationDataset::SaltAndPepperNoiseMaximumDensity.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SaltAndPepperNoiseMinimumDensity
  { get; set; }
```

Remarks

This noise is computed after all the other noises.

EClassificationDataset.SameLabelMaxOverlap

Maximum overlap between objects with the same label in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SameLabelMaxOverlap
  { get; }
```

EClassificationDataset.Save

Saves a classification dataset to disk, containing the file paths to the images in the dataset and their associated label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

A string containing the full path to the dataset file.

serializer

The serializer.

Remarks

This method only save the image that were given to this EClassificationDataset instance as EBaseROI pointers.
To obtain a portable EClassificationDataset file, please use EClassificationDataset::Export.

EClassificationDataset.SetImageLabel

Sets the label of images in the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetImageLabel(
 int index,
 string label
 )

void SetImageLabel(
 string filter,
 string label
 )
```

Parameters

index

The index of the image for which to set the label.

label

The label

filter

A glob filter

Remarks

The filter is a glob pattern. This means the wildcard characters "*" and "?" correspond to "zero or more character" and "a single character" respectively. For example, the filter "*_good_*.png" will match any filename that contains the string "_good_" and has a png extension.

EClassificationDataset.SetImageObject

Sets the specified object for the given image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetImageObject(
 int imageIndex,
 int objectIndex,
 Euresys.Open_eVision.EasyDeepLearning.ELocatorObject obj
 )

void SetImageObject(
 int imageIndex,
 int objectIndex,
 string label
 )
```

```
void SetImageObject(
 int imageIndex,
 int objectIndex,
 Euresys.Open_eVision.ERectangleRegion region
 )
```

Parameters

imageIndex
Index of the image

objectIndex
Index of the object between 0 and EClassificationDataset::GetImageNumObjects

obj
Object

label
New label for the object

region
New region for the object

Remarks

If the label of the object does not exist in the object labels of the dataset, the label will be added to the object labels of the dataset.

EClassificationDataset.SetLabel

Sets the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1). This operation does not add a new label to the dataset but simply renames an existing label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetLabel(
 int index,
 string label
 )
```

Parameters

index
Label index

label
Replacement label

EClassificationDataset.SetLabelWeight

Sets the weight associated to the i-th label of the dataset (starting from 0 to EClassificationDataset::NumLabels - 1). This operation does not add a new label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetLabelWeight(
 int index,
 float weight
 )
```

Parameters

index

Label index

weight

-

EClassificationDataset.SetMask

Sets the mask region/don't care area for the given image. The mask is defined with respect to the region of interest of the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetMask(
 int imageIndex,
 Euresys.Open_eVision.ERegion mask
 )
```

Parameters

imageIndex

Index of the image for which to get the mask region

mask

Mask to set on the image

EClassificationDataset.SetObjectLabel

Sets an object label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetObjectLabel(
 int labelIndex,
 string newLabel
 )
void SetObjectLabel(
 string oldLabel,
 string newLabel
 )
```

Parameters

labelIndex
Index of the object label

newLabel
New label to be set

oldLabel
Old label to change

EClassificationDataset.SetObjectLabelWeight

Sets the weight of an object label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetObjectLabelWeight(
 int labelIndex,
 float weight
 )
void SetObjectLabelWeight(
 string label,
 float weight
 )
```

Parameters

labelIndex
Index of the object label

weight
New weight

label
Label

EClassificationDataset.SetRegionOfInterest

Sets the region of interest for the specified image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetRegionOfInterest(
 int imageIndex,
 int xOrg,
 int yOrg,
 int width,
 int height
 )
```

Parameters

imageIndex
Index of the image.
xOrg
ROI origin abscissa
yOrg
ROI origin ordinate
width
ROI witdh
height
ROI height

EClassificationDataset.SetSegmentationLabel

Sets the segmentation labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetSegmentationLabel(
 int index,
 string label
 )
```

Parameters

index
Index of the segmentation label
label
String representing the segmentation label

Remarks

The segmentation label index 0 is reserved and corresponds to the "background" label. This segmentation label can't be changed.

EClassificationDataset.SetSegmentationLabelWeight

Sets the segmentation label weight.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetSegmentationLabelWeight(
 int index,
 float weight
 )
```

```
void SetSegmentationLabelWeight(
 string label,
 float weight
 )
```

Parameters

index
Index of the segmentation label

weight
Weight of the segmentation label

label
Segmentation label

EClassificationDataset.SetSegmentationMap

Sets the segmentation map of an image. The segmentation map is a 16-bit EROIBW16 image where the value of each pixel is equal to the corresponding segmentation label index (see EClassificationDataset::GetSegmentationLabel).
If an image has no segmentation (EClassificationDataset::HasSegmentation), the getter will throw an excpetion.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetSegmentationMap(
 int imageIndex,
 Euresys.Open_eVision.EROIBW16 segmentationMap
 )
```

Parameters

imageIndex
Image index

segmentationMap
Segmentation map

EClassificationDataset.SpeckleNoiseMaximumStandardDeviation

The speckle noise maximum standard deviation.
The speckle noise is a multiplicative noise sampled from a Gamma distribution with a mean of 1 and with its standard deviation between EClassificationDataset::SpeckleNoiseMinimumStandardDeviation and EClassificationDataset::SpeckleNoiseMaximumStandardDeviation.
Its value must be strictly higher than EClassificationDataset::SpeckleNoiseMinimumStandardDeviation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SpeckleNoiseMaximumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EClassificationDataset.SpeckleNoiseMinimumStandardDeviation

The speckle noise minimum standard deviation.
The speckle noise is a multiplicative noise sampled from a Gamma distribution with a mean of 1 and with its standard deviation between EClassificationDataset::SpeckleNoiseMinimumStandardDeviation and EClassificationDataset::SpeckleNoiseMaximumStandardDeviation.
Its value must be strictly positive and lower than EClassificationDataset::SpeckleNoiseMaximumStandardDeviation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SpeckleNoiseMinimumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EClassificationDataset.SplitDataset

Splits the dataset in two parts to be used for training and validation respectively.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SplitDataset(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset d1,
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset d2,
 float proportion,
 bool random
 )
```

Parameters

d1

First part of the dataset

d2

Second part of the dataset

proportion

Proportion of image of each class to put into the first part. The remaining images are put in d2

random

Randomly sample the images.

EClassificationDataset.SplitDatasetForLocator

Splits the dataset in two parts for training and validation of a ELocator tool. Images without object labeling are excluded from the split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SplitDatasetForLocator(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset d1,
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset d2,
 float proportion,
 bool random
 )
```

Parameters

d1

First part of the dataset

d2

Second part of the dataset

proportion

Proportion of image of each class to put into the first part. The remaining images are put in d2

random

Randomly sample the images.

Remarks

The method ensures that all the object labels are represented in d1. Thus, even when the parameter random is set to false, the images in d1 and d2 can be ordered differently than they were in the original dataset.

EClassificationDataset.SplitDatasetForSegmentation

Splits the dataset in two parts for a supervised segmenter. The two parts are to be used for training and validation respectively.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SplitDatasetForSegmentation(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset d1,
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset d2,
 float proportion,
 bool random
 )
```

Parameters

d1

First part of the dataset

d2

Second part of the dataset

proportion

Proportion of image of each class to put into the first part. The remaining images are put in d2

random

Randomly sample the images.

Remarks

The method ensures that all the segmentation labels are represented in d1. Thus, even when the parameter random is set to false, the images in d1 and d2 can be ordered differently than they were in the original dataset.

EClassificationDataset.UnsetImageLabel

Unset the label of the given image of the dataset. After this operation, the given image will have no classification labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void UnsetImageLabel(
 int index
 )
```

Parameters

index

Index of the image for which to unset the label

EClassificationDataset.UnsetImageObjectLabeling

Unsets the object labeling for the specified image. This sets the image as not having been labelled for object detection. This image won't be use for training with a ELocator tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void UnsetImageObjectLabeling(
 int imageIndex
 )
```

Parameters

imageIndex

Index of the image

EClassificationDataset.UnsetSegmentation

Unsets the segmentation of an image. After this operation, the image will have no segmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void UnsetSegmentation(
 int imageIndex
 )
```

Parameters

imageIndex

Image index

EClassificationDataset.Width

Width of the region of interest of the first image added to the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint Width
  { get; }
```

4.56. EClassificationMetrics Class

Collection of metrics used to evaluate the state of an EClassifier.
A metric is a value summarizing a collection of classification results (EClassificationResult).
New results can be added to the object individually with EClassificationMetrics::AddResult or collectively with EClassificationMetrics::AddMetrics.
EClassificationMetrics contains the following metrics:
- the accuracy (see EClassificationMetrics::Accuracy)
- the error (see EClassificationMetrics::Error)

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Accuracy	The accuracy of the classifier.
BalancedAccuracy	The balanced accuracy.
BalancedError	The balanced error.
Error	The error of the classifier.

Methods

AddMetrics	Adds the other metrics to the current metrics of this object.
AddResult	Adds the given result with the corresponding ground truth label to the metrics.
CanComputeWeightedError	Whether the object can be used to get weighted, balanced, and label errors.
EClassificationMetrics	Constructs an EClassificationMetrics object.
GetConfusion	Confusion value of one label with another. The confusion value of a label with another is the number of images belonging to this label that are classified as belonging to the other label.
GetLabelAccuracy	The accuracy of the classifier for a given label.
GetLabelError	The error of the classifier for a given label.
GetWeightedAccuracy	The label weighted accuracy.
GetWeightedError	The label weighted error.
IsValid	Indicates whether the object contains at least one classification result.
Load	Loads a classification metric. The given ESerializer must have been created for reading.
operator=	Assignment operator
Save	Saves a classification metric. The given ESerializer must have been created for writing.

EClassificationMetrics.Accuracy

The accuracy of the classifier.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Accuracy
  { get; }
```

Remarks

The accuracy is the number of images that were correctly classified (also called the true positives) over the total number of images that was used to evaluate the classifier.

EClassificationMetrics.AddMetrics

Adds the other metrics to the current metrics of this object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void AddMetrics(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics other
 )
```

Parameters

other

Classification metrics

EClassificationMetrics.AddResult

Adds the given result with the corresponding ground truth label to the metrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void AddResult(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationResult result,
 string groundtruthLabel
 )
```

Parameters

result

A reference to an EClassificationResult object.

groundtruthLabel

The ground truth label corresponding to the result

EClassificationMetrics.BalancedAccuracy

The balanced accuracy.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float BalancedAccuracy
```

```
{ get; }
```

Remarks

The balanced accuracy is the label weighted accuracy with the same weight for each labels.

EClassificationMetrics.BalancedError

The balanced error.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BalancedError
{ get; }
```

Remarks

The balanced error is the label weighted error with the same weight for each labels.
If EClassificationMetrics::CanComputeWeightedError is false, this method is an alias for EClassificationMetrics::Error.

EClassificationMetrics.CanComputeWeightedError

Whether the object can be used to get weighted, balanced, and label errors.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool CanComputeWeightedError(
 )
```

EClassificationMetrics.EClassificationMetrics

Constructs an EClassificationMetrics object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EClassificationMetrics(
 )

void EClassificationMetrics(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics other
 )
```

Parameters

other

Reference to the EClassificationMetrics object that should be copied

EClassificationMetrics.Error

The error of the classifier.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Error
  { get; }
```

Remarks

The error, which is also called the loss, is the quantity that is minimized during the training of the deep neural network. For classification, the error is the crossentropy.

EClassificationMetrics.GetConfusion

Confusion value of one label with another.
The confusion value of a label with another is the number of images belonging to this label that are classified as belonging to the other label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint GetConfusion(
 string trueClass,
 string predictedClass
 )
```

Parameters

trueClass

The label for which to obtain the confusion value

predictedClass

The label with which there is a confusion

EClassificationMetrics.GetLabelAccuracy

The accuracy of the classifier for a given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetLabelAccuracy(
 string label
 )
```

Parameters

label

-

Remarks

The label accuracy is the number of images of a given label that were correctly classified (also called the true positives) over the total number of images of that label that was used to evaluate the classifier.
If there is no results for the given label, the method will throw an exception.

EClassificationMetrics.GetLabelError

The error of the classifier for a given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetLabelError(
 string label
 )
```

Parameters

label

The label from which to get the error.

Remarks

The label error corresponds to the error only for images of the given label.
If there is no results for the given label, the method will throw an exception.
If EClassificationMetrics::CanComputeWeightedError is false, this method is an alias for EClassificationMetrics::Error.

EClassificationMetrics.GetWeightedAccuracy

The label weighted accuracy.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetWeightedAccuracy(
 float[] weights
 )
```

```
float GetWeightedAccuracy(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

weights

Array of label weights for the labels of the classifier (see EClassifier)

dataset

Dataset from which to use the label weights

Remarks

The weighted accuracy is the weighted average of the label accuracies (see EClassificationMetrics::GetLabelAccuracy). If there is no results for a given label, it will be ignored in the weighted accuracy.

EClassificationMetrics.GetWeightedError

The label weighted error.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetWeightedError(
 float[] weights
 )
float GetWeightedError(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

weights

Array of label weights for the labels of the classifier (see EClassifier)

dataset

Dataset from which to use the label weights

Remarks

The weighted error is the weighted average of the label errors (see EClassificationMetrics::GetLabelError).
If there isn't any result for a given label, it will be ignored in the weighted error.
If EClassificationMetrics::CanComputeWeightedError is false, this method is an alias for EClassificationMetrics::Error.

EClassificationMetrics.IsValid

Indicates whether the object contains at least one classification result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsValid(
 )
```

EClassificationMetrics.Load

Loads a classification metric. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EClassificationMetrics.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics operator=(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics other
 )
```

Parameters

other
Reference to the EClassificationMetrics object used for the assignment

EClassificationMetrics.Save

Saves a classification metric. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.57. EClassificationResult Class

An EClassificationResult object represents the result of a classification.
The most probable label and its probability are accessible through the methods EClassificationResult::BestLabel and EClassificationResult::BestProbability.
The probability and ranking of all labels are accessible through the EClassificationResult and EClassificationResult methods.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

BestLabel	Gets the most probable label.
BestLabelId	Gets the most probable label id.
BestProbability	Gets the probability associated with the most probable label
GroundtruthLabel	Ground truth label.
Heatmap	Heatmap.
NumLabels	Number of labels for which we have a probability or a ranking.

Methods

DrawHeatmap	-
EClassificationResult	Constructs a non-valid EClassificationResult.
GetColorizedHeatmap	Colorized heatmap with no transparency.
GetColorizedHeatmap WithTransparency	Colorized heatmap with transparency. When a minimum and maximum alpha values are given, the transparency value for a pixel will depend on the value of the heatmap at that pixel. The range of heatmap values [0, 255] will be mapped to the range [minAlpha, maxAlpha].

GetLabel	Classification label. The labels are indexed from 0 to EClassificationResult::NumLabels.
GetLabelColor	Color of a label.
GetProbability	Gets the probability corresponding to the given label.
GetRanking	Gets the ranking corresponding to the given label. The ranking goes from 1 (most probable label) to EClassifier (least probable label).
HasGroundtruth	Whether the result has a ground truth.
HasHeatmap	Whether the result contains an heatmap.
IsValid	Indicates whether the result was produced by EClassifier. A default contructed EClassificationResult is not valid.
operator=	Assignment operator

EClassificationResult.BestLabel

Gets the most probable label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string BestLabel
  { get; }
```

EClassificationResult.BestLabelId

Gets the most probable label id.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BestLabelId
  { get; }
```

EClassificationResult.BestProbability

Gets the probability associated with the most probable label

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestProbability
  { get; }
```

EClassificationResult.DrawHeatmap

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void DrawHeatmap(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHeatmap(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float minAlpha,
 float maxAlpha,
 Euresys.Open_eVision.EasyDeepLearning.EHeatmapColormap colormap,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHeatmap(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHeatmap(
 IntPtr graphicsContext,
 float minAlpha,
 float maxAlpha,
 Euresys.Open_eVision.EasyDeepLearning.EHeatmapColormap colormap,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

-

zoomX

-

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

minAlpha

Minimum transparency value.

maxAlpha

Maximum transparency value.

colormap

Color map

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EClassificationResult.EClassificationResult

Constructs a non-valid EClassificationResult.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EClassificationResult(
 )

void EClassificationResult(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationResult other
 )
```

Parameters

other

Reference to the EClassificationResult object that should be copied

EClassificationResult.GetColorizedHeatmap

Colorized heatmap with no transparency.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageC24 GetColorizedHeatmap(
 Euresys.Open_eVision.EasyDeepLearning.EHeatmapColormap colormap
 )
```

Parameters

colormap
Color map

EClassificationResult.GetColorizedHeatmapWithTransparency

Colorized heatmap with transparency.
When a minimum and maximum alpha values are given, the transparency value for a pixel will depend on the value of the heatmap at that pixel. The range of heatmap values [0, 255] will be mapped to the range [minAlpha, maxAlpha].

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageC24A GetColorizedHeatmapWithTransparency(
 float alpha,
 Euresys.Open_eVision.EasyDeepLearning.EHeatmapColormap colormap
 )
Euresys.Open_eVision.EImageC24A GetColorizedHeatmapWithTransparency(
 float minAlpha,
 float maxAlpha,
 Euresys.Open_eVision.EasyDeepLearning.EHeatmapColormap colormap
 )
```

Parameters

alpha
Transparency to apply everywhere
colormap
Color map
minAlpha
Minimum transparency value.
maxAlpha
Maximum transparency value.

EClassificationResult.GetLabel

Classification label. The labels are indexed from 0 to EClassificationResult::NumLabels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetLabel(
 int labelId
 )
```

Parameters

labelId

Id of the label

EClassificationResult.GetLabelColor

Color of a label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ERGBColor GetLabelColor(
 int i
 )
Euresys.Open_eVision.ERGBColor GetLabelColor(
 string label
 )
```

Parameters

i

Index of the label for which to get the color (between 0 and EClassificationResult::NumLabels - 1)

label

Label for which to get the color

Remarks

The label color is controlled at the tool level. To change a color in a result, change the label color in the tool.

EClassificationResult.GetProbability

Gets the probability corresponding to the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetProbability(
 string label
 )
```

Parameters

label

The label

EClassificationResult.GetRanking

Gets the ranking corresponding to the given label. The ranking goes from 1 (most probable label) to EClassifier (least probable label).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetRanking(
 string label
 )
```

Parameters

label

The label

EClassificationResult.GroundtruthLabel

Ground truth label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GroundtruthLabel
  { get; }
```

EClassificationResult.HasGroundtruth

Whether the result has a ground truth.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasGroundtruth(
 )
```

EClassificationResult.HasHeatmap

Whether the result contains an heatmap.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasHeatmap(
 )
```

EClassificationResult.Heatmap

Heatmap.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageBW8 Heatmap
  { get; }
```

EClassificationResult.IsValid

Indicates whether the result was produced by EClassifier.
A default contructed EClassificationResult is not valid.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsValid(
 )
```

EClassificationResult.NumLabels

Number of labels for which we have a probability or a ranking.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumLabels
  { get; }
```

EClassificationResult.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EClassificationResult operator=(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationResult other
 )
```

Parameters

other

Reference to the EClassificationResult object used for the assignment

4.58. EClassifier Class

EClassifier allows to train a classifier using an EClassificationDataset object and classify new images.

As required by Deep Learning techniques, the input image of EClassifier must be of the same format (width, height, number of channels). By default, this format will be the one of the first image added to the dataset used for training unless its width and height is smaller than the minimum width and height supported by the classifier (See EClassifier::MinimumWidth and EClassifier::MinimumHeight). In this case, the input resolution will be the minimum resolution supported by the classifier. The format can also be specified by the EClassifier::Width, EClassifier::Height and EClassifier::Channels. methods.

By default, images that don't satisfy the image format of the classifier are automatically reformatted. This behavior can be controlled through the EClassifier::EnableAutomaticImageReformat method. When the automatic image reformatting is disabled, training or classifying an image that doesn't satisfy the input image format will result in an exception.

Once trained, the input image format cannot be changed.

Base Class:EDeepLearningTool

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Capacity	DEPRECATED. Use EClassifier::ModelType instead. Capacity of classifier to use. Be aware that changing the classifier capacity will delete the effect of any previous training. The capacity will be translated to the corresponding type (Small, Normal, or Large).
Channels	Number of channels for input images of the classifier. The number of channels can be either 1 (monochrome image) or 3 (RGB image). By default, this value will be set from the format of the first image added to the training dataset.
ComputeHeatmapWithResult	Whether to always compute the heatmap along the result when applying the tool. If true, the heatmap is available through EClassificationResult::Heatmap.
EnableAutomaticImageReformat	Enable automatic image reformat (true by default).

EnableHistogramEqualization	Enable histogram equalization of all images passing through the classifier. (false by default)
Height	Height for input images of the classifier. By default, this value will be set from the format of the first image of the dataset used for training.
MinimumHeight	Minimum height for input images of the classifier. This value is equal to 1 for standard networks.
MinimumWidth	Minimum width for input images of the classifier. This value is equal to 1 for standard networks.
ModelType	Model type for training. Default: "Normal". The list of available models is available through EClassifier.
NumAvailableModelTypes	Number of available models for training an EasyClassify tool.
ToolType	Type of the deep learning tool.
UsePretrainedModel	Whether to use a pretrained model when training. Default: true if the pretrained model are found on the disk.
Width	Width for input images of the classifier. By default, this value will be set from the format of the first image of the dataset used for training.

Methods

Classify	Classifies images and returns the complete results as an EClassificationResult object. The method throws an exception if the input image does not fulfill the input specification.
EClassifier	Constructs a EClassifier object.
Evaluate	Evaluates the EClassifier using the given EClassificationDataset.
GetAvailableModelTypes	Get the i-th available models to be used with EClassifier::ModelType.
GetColorizedHeatMap	-
GetColorizedHeatmapWithTransparency	Colorized heatmap with transparency. When the minimum and maximum alpha values are different from each other, the transparency value for a pixel will depend on the value of the heatmap at that pixel. The range of heatmap values [0, 255] will be mapped to the range [minAlpha, maxAlpha].
GetHeatMap	Gets a heatmap associated with the given label. A heatmap is an image that indicates which pixels in the original image best explain the given label.
GetTrainingMetrics	Gets the metrics obtained with the training dataset at the given iteration. The iterations are indexed between 0 and EDeepLearningTool::NumTrainedIterations - 1.
GetValidationMetrics	Gets the metrics obtained with the validation dataset at the given iteration. The iterations are indexed between 0 and EDeepLearningTool::NumTrainedIterations - 1.

HasPretrainedModel	Whether a pretrained model for the current configuration can be found.
LoadAsPretrained	Loads the classifier and use it as a pretrained model.
operator=	Assignment operator
SerializeSettings	Serializes the classifier settings.

EClassifier.Capacity

This property is deprecated.

DEPRECATED. Use EClassifier::ModelType instead. Capacity of classifier to use. Be aware that changing the classifier capacity will delete the effect of any previous training. The capacity will be translated to the corresponding type (Small, Normal, or Large).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EClassifierCapacity Capacity
  { get; set; }
```

EClassifier.Channels

Number of channels for input images of the classifier. The number of channels can be either 1 (monochrome image) or 3 (RGB image). By default, this value will be set from the format of the first image added to the training dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Channels
  { get; set; }
```

Remarks

If the classifier is not trained or the value was not explicitely set, its value will be 0.

EClassifier.Classify

Classifies images and returns the complete results as an EClassificationResult object.
The method throws an exception if the input image does not fulfill the input specification.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EClassificationResult Classify(
 Euresys.Open_eVision.EBaseROI img
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult Classify(
 Euresys.Open_eVision.EBaseROI img,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EBaseROI[] imgList,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EBaseROI[] imgList
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EImageBW8[] imgList,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EImageBW8[] imgList
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EImageBW16[] imgList,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EImageBW16[] imgList
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EImageC24[] imgList,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.EClassificationResult[] Classify(
 ref Euresys.Open_eVision.EImageC24[] imgList
 )
```

Parameters

img

Image to classify

mask

Mask of image to classify

imgList

Vector of images to classify

Remarks

Classifying a set of images is usually faster than classifying each image sequentially.
To maximize the classification speed on a GPU, EClassifier and the size of the set of input images must be equal to the value returned by EDeepLearningTool.

EClassifier.ComputeHeatmapWithResult

Whether to always compute the heatmap along the result when applying the tool. If true, the heatmap is available through EClassificationResult::Heatmap.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool ComputeHeatmapWithResult
  { get; set; }
```

EClassifier.EClassifier

Constructs a EClassifier object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EClassifier(
 )
void EClassifier(
 Euresys.Open_eVision.EasyDeepLearning.EClassifier other
 )
```

Parameters

other

Reference to the EClassifier object that should be copied

EClassifier.EnableAutomaticImageReformat

Enable automatic image reformat (true by default).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool EnableAutomaticImageReformat
  { get; set; }
```

EClassifier.EnableHistogramEqualization

Enable histogram equalization of all images passing through the classifier. (false by default)

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool EnableHistogramEqualization
  { get; set; }
```

EClassifier.Evaluate

Evaluates the EClassifier using the given EClassificationDataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics Evaluate(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

dataset

EClassificationDataset with which to evaluate the classifier

Remarks

This method computes various metrics (see EClassificationMetrics on the given dataset. The method ignores the label weights and the data augmentation settings of the given dataset. However, the label weights can be taken into consideration in the returned EClassificationMetrics object.

EClassifier.GetAvailableModelTypes

Get the i-th available models to be used with EClassifier::ModelType.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetAvailableModelTypes(
 int i
 )
```

Parameters

i

Index of the model between 0 and EClassifier::NumAvailableModelTypes - 1.

EClassifier.GetColorizedHeatMap

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageC24 GetColorizedHeatMap(
 Euresys.Open_eVision.EBaseROI image,
 string label
 )
```

Parameters

image

-

label

-

EClassifier.GetColorizedHeatmapWithTransparency

Colorized heatmap with transparency.
When the minimum and maximum alpha values are different from each other, the transparency value for a pixel will depend on the value of the heatmap at that pixel. The range of heatmap values [0, 255] will be mapped to the range [minAlpha, maxAlpha].

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageC24A GetColorizedHeatmapWithTransparency(
 Euresys.Open_eVision.EBaseROI image,
 string label,
 float minAlpha,
 float maxAlpha,
 Euresys.Open_eVision.EasyDeepLearning.EHeatmapColormap colormap
 )
```

Parameters

image
A reference to the image we want to generate the heatmap from.

label
A reference to the string representing the label we want to explain for the given image.

minAlpha
Minimum transparency value.

maxAlpha
Maximum transparency value.

colormap
Color map

EClassifier.GetHeatMap

Gets a heatmap associated with the given label. A heatmap is an image that indicates which pixels in the original image best explain the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageBW8 GetHeatMap(
 Euresys.Open_eVision.EBaseROI image,
 string label
 )
```

Parameters

image
A reference to the image we want to generate the heatmap from.

label
A reference to the string representing the label we want to explain for the given image.

EClassifier.GetTrainingMetrics

Gets the metrics obtained with the training dataset at the given iteration.
The iterations are indexed between 0 and EDeepLearningTool::NumTrainedIterations - 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics GetTrainingMetrics(
 int id
 )
```

Parameters

id
The iteration index

EClassifier.GetValidationMetrics

Gets the metrics obtained with the validation dataset at the given iteration.
The iterations are indexed between 0 and EDeepLearningTool::NumTrainedIterations - 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EClassificationMetrics GetValidationMetrics(
 int id
 )
```

Parameters

id

The iteration index

EClassifier.HasPretrainedModel

Whether a pretrained model for the current configuration can be found.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasPretrainedModel(
 )
```

EClassifier.Height

Height for input images of the classifier. By default, this value will be set from the format of the first image of the dataset used for training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Height
  { get; set; }
```

Remarks

If the classifier is not trained or the value was not explicitely set, its value will be 0.

EClassifier.LoadAsPretrained

Loads the classifier and use it as a pretrained model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void LoadAsPretrained(
 string path
 )
```

Parameters

path

-

EClassifier.MinimumHeight

Minimum height for input images of the classifier. This value is equal to 1 for standard networks.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint MinimumHeight
  { get; }
```

EClassifier.MinimumWidth

Minimum width for input images of the classifier. This value is equal to 1 for standard networks.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint MinimumWidth
  { get; }
```

EClassifier.ModelType

Model type for training. Default: "Normal".
The list of available models is available through EClassifier.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string ModelType
  { get; set; }
```

EClassifier.NumAvailableModelTypes

Number of available models for training an EasyClassify tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
static int NumAvailableModelTypes
  { get; }
```

EClassifier.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EClassifier operator=(
 Euresys.Open_eVision.EasyDeepLearning.EClassifier other
 )
```

Parameters

other

Reference to the EClassifier object used for the assignment

EClassifier.SerializeSettings

Serializes the classifier settings.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

EClassifier.ToolType

Type of the deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
override Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType ToolType
  { get; }
```

EClassifier.UsePretrainedModel

Whether to use a pretrained model when training.
Default: true if the pretrained model are found on the disk.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool UsePretrainedModel
  { get; set; }
```

EClassifier.Width

Width for input images of the classifier. By default, this value will be set from the format of the first image of the dataset used for training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Width
  { get; set; }
```

Remarks

If the classifier is not trained or the value was not explicitely set, its value will be 0.

4.59. ECode Class

Represents a Code.

Namespace: Euresys.Open_eVision

Properties

BarCode	-
CodeType	Code type.
DecodedString	Decoded code string.
MatrixCode	-
Position	Code position.

QRCode	-

Methods

DrawPosition	Draws the Position of the Code.
DrawPositionWithCurrentPen	Draws the Position of the Code using the pen currently set in the graphical context.
ECode	Creates an ECode object.
operator=	Assignment operator

ECode.BarCode

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EasyBarCode2.EBarCode BarCode
  { get; }
```

ECode.CodeType

Code type.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECodeType CodeType
  { get; }
```

ECode.DecodedString

Decoded code string.

Namespace: Euresys.Open_eVision

```
[C#]
string DecodedString
  { get; }
```

ECode.DrawPosition

Draws the Position of the Code.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawPosition(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawPosition(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

Handle of the graphics context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECode.DrawPositionWithCurrentPen

This method is deprecated.

Draws the Position of the Code using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawPositionWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECode.ECode

Creates an ECode object.

Namespace: Euresys.Open_eVision

[C#]

```
void ECode(
 )
void ECode(
 Euresys.Open_eVision.ECode other
 )
```

Parameters

other

Another ECode object to be copied in the new ECode object.

ECode.MatrixCode

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode MatrixCode
  { get; }
```

ECode.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECode operator=(
 Euresys.Open_eVision.ECode other
 )
```

Parameters

other

ECode object to be copied.

ECode.Position

Code position.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQuadrangle Position
  { get; }
```

ECode.QRCode

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCode QRCode
  { get; }
```

4.60. ECodedElement Class

This class encapsulates either an object or a hole in an object, in a coded image.

Remarks

This abstract class provides a large set of methods applicable to a particular coded element. The set includes methods to get the features of a coded element, to draw coded elements, and to render flexible masks.

Derived Class(es):EHoleEObject

Namespace: Euresys.Open_eVision

Properties

Area	Returns the number of pixels inside the coded element.
BottomLimit	Returns the highest (integer) Y-coordinate of all the pixels of the coded element.
BoundingBox	Returns the bounding box of the coded element (Feret box at orientation 0 degrees).
BoundingBoxCenter	Returns the coordinates of the center of the bounding box of the coded element.
BoundingBoxCenterX	Returns the abscissa of the center of the bounding box of the coded element.
BoundingBoxCenterY	Returns the ordinate of the center of the bounding box of the coded element.
BoundingBoxHeight	Returns the height of the bounding box (Feret diameter at 90 degrees).
BoundingBoxWidth	Returns the width of the bounding box (Feret diameter at 0 degrees).
Contour	Returns the coordinates of the starting point of the countour of the coded element.
ContourPath	Returns the contour path. The contour paths is computed using EContourMode_ ClockwiseAlwaysClosed.
ContourX	Returns the abscissa of the starting point of the countour of the coded element.
ContourY	Returns the ordinate of the starting point of the countour of the coded element.
ConvexHull	Gets the convex hull of the coded element.
Eccentricity	Returns the eccentricity of the ellipse of inertia.
ElementIndex	Returns the index of the coded element.
EllipseAngle	Returns the angle of the ellipse of inertia.
EllipseHeight	Returns the length of the short axis of the ellipse of inertia.

EllipseWidth	Returns the length of the long axis of the ellipse of inertia.
FeretBox22Box	Returns the Feret box at orientation 22.5 degrees.
FeretBox22Center	Returns the coordinates of the center of the Feret box oriented at 22.5 degrees.
FeretBox22CenterX	Returns the abscissa of the center of the Feret box oriented at 22.5 degrees.
FeretBox22CenterY	Returns the ordinate of the center of the Feret box oriented at 22.5 degrees.
FeretBox22Height	Returns the height of the Feret box oriented at 22.5 degrees (Feret diameter at 112.5 degrees).
FeretBox22Width	Returns the width of the Feret box oriented at 22.5 degrees (Feret diameter at 22.5 degrees).
FeretBox45Box	Returns the Feret box at orientation 45 degrees.
FeretBox45Center	Returns the coordinates of the center of the Feret box oriented at 45 degrees.
FeretBox45CenterX	Returns the abscissa of the center of the Feret box oriented at 45 degrees.
FeretBox45CenterY	Returns the ordinate of the center of the Feret box oriented at 45 degrees.
FeretBox45Height	Returns the height of the Feret box oriented at 45 degrees (Feret diameter at 135 degrees).
FeretBox45Width	Returns the width of the Feret box oriented at 45 degrees (Feret diameter at 45 degrees).
FeretBox68Box	Returns the Feret box at orientation 67.5 degrees.
FeretBox68Center	Returns the coordinates of the center of the Feret box oriented at 67.5 degrees.
FeretBox68CenterX	Returns the abscissa of the center of the Feret box oriented at 67.5 degrees.
FeretBox68CenterY	Returns the ordinate of the center of the Feret box oriented at 67.5 degrees.
FeretBox68Height	Returns the height of the Feret box oriented at 67.5 degrees (Feret diameter at 157.5 degrees).
FeretBox68Width	Returns the width of the Feret box oriented at 67.5 degrees (Feret diameter at 67.5 degrees).
GravityCenter	Returns the gravity center of the coded element.
GravityCenterX	Returns the abscissa of the gravity center of the coded element.
GravityCenterY	Returns the ordinate of the gravity center of the coded element.
IsCodedElement	Tests whether the coded element is an object, a hole or a coded element.
IsHole	Tests whether the coded element is an object, a hole or a coded element.

IsObject	Tests whether the coded element is an object, a hole or a coded element.
LargestRun	Returns the length of the largest run inside the coded element.
LayerIndex	Returns the index of the layer in the coded image to which the coded element belongs.
LeftLimit	Returns the lowest (integer) X-coordinate of all the pixels of the coded element.
MinimumEnclosingRectangle	Returns the Minimum-Area Enclosing Rectangle.
MinimumEnclosingRectangleAngle	Returns the angle of the Minimum-Area Enclosing Rectangle.
MinimumEnclosingRectangleCenter	Returns the coordinates of the center of the Minimum-Area Enclosing Rectangle.
MinimumEnclosingRectangleCenterX	Returns the abscissa of the center of the Minimum-Area Enclosing Rectangle.
MinimumEnclosingRectangleCenterY	Returns the ordinate of the center of the Minimum-Area Enclosing Rectangle.
MinimumEnclosingRectangleHeight	Returns the height of the Minimum-Area Enclosing Rectangle.
MinimumEnclosingRectangleWidth	Returns the width of the Minimum-Area Enclosing Rectangle.
RightLimit	Returns the highest (integer) X-coordinate of all the pixels of the coded element.
RunCount	Returns the number of runs inside the coded element.
RunsIterator	Returns an iterator to the runs of the coded element.
SigmaX	Returns the centered moment of inertia around X (average squared X-deviation).
SigmaXX	Returns the centered cross moment of inertia (average X-deviation * Y-deviation).
SigmaXY	Returns the reduced, centered moment of inertia (around the principal inertia axis).
SigmaY	Returns the centered moment of inertia around Y (average squared Y-deviation).
SigmaYY	Returns the reduced, centered moment of inertia (around the secondary inertia axis).
TopLimit	Returns the lowest (integer) Y-coordinate of all the pixels of the coded element.

Methods

AsHole	Down-casts the coded element as a hole.
AsObject	Down-casts the coded element as an object.

ComputeConvexHull	Computes the convex hull of the coded element.
ComputeFeretBox	Computes the Feret box at a specific orientation.
ComputePixelGrayAverage	Computes the average gray-level value of the pixels of a given image over the coded element.
ComputePixelGrayDeviation	Computes the standard deviation of the gray-level values of a given image over the coded element.
ComputePixelGrayVariance	Computes the variance of the gray-level values of a given image over the coded element.
ComputePixelMax	Computes the maximum gray level of the pixels of a given image over the coded element.
ComputePixelMin	Computes the minimum gray level of the pixels of a given image over the coded element.
ComputeWeightedGravityCenter	Computes the gravity center of a given image over the coded element.
GetCentralMoment	Computes the central, two-dimensional moment of order (p,q).
GetMoment	Computes the raw, two-dimensional moment of order (p,q).
GetNormalizedCentralMoment	Computes the scale-invariant, central, two-dimensional moment of order (p,q).
operator==	-
RenderMask	Creates a Flexible Mask from the coded element.
ToRegion	Creates an ERegion from the ECodedElement. The ERegion represents all the pixels which are within the bounding box of the Pattern.

ECodedElement.Area

Returns the number of pixels inside the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
uint Area
  { get; }
```

Remarks

Equivalently, the area corresponds to the sum of the length of the runs of the coded element.

ECodedElement.AsHole

Down-casts the coded element as a hole.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EHole AsHole(
 )
Euresys.Open_eVision.EHole AsHole(
 )
```

Remarks

This method throws an exception if the coded element is in fact an object.

ECodedElement.AsObject

Down-casts the coded element as an object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObject AsObject(
 )
Euresys.Open_eVision.EObject AsObject(
 )
```

Remarks

This method throws an exception if the coded element is in fact a hole.

ECodedElement.BottomLimit

Returns the highest (integer) Y-coordinate of all the pixels of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
int BottomLimit
  { get; }
```

Remarks

For a coded element E, this value is defined as: <latex>\left\lceil \max \left\{ y \mid (\exists x) (x,y) \in E \right\} \right\rceil </latex>

$$\left\lceil \max \left\{ y \mid (\exists x)\ (x, y) \in E \right\} \right\rceil$$

ECodedElement.BoundingBox

Returns the bounding box of the coded element (Feret box at orientation 0 degrees).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERotatedBoundingBox BoundingBox
  { get; }
```

ECodedElement.BoundingBoxCenter

Returns the coordinates of the center of the bounding box of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint BoundingBoxCenter
  { get; }
```

ECodedElement.BoundingBoxCenterX

Returns the abscissa of the center of the bounding box of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
float BoundingBoxCenterX
  { get; }
```

ECodedElement.BoundingBoxCenterY

Returns the ordinate of the center of the bounding box of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
float BoundingBoxCenterY
  { get; }
```

ECodedElement.BoundingBoxHeight

Returns the height of the bounding box (Feret diameter at 90 degrees).

Namespace: Euresys.Open_eVision

[C#]

```
float BoundingBoxHeight
```

```
{ get; }
```

ECodedElement.BoundingBoxWidth

Returns the width of the bounding box (Feret diameter at 0 degrees).

Namespace: Euresys.Open_eVision

```
[C#]
float BoundingBoxWidth
  { get; }
```

ECodedElement.ComputeConvexHull

Computes the convex hull of the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
void ComputeConvexHull(
 Euresys.Open_eVision.EPathVector result
 )
```

Parameters

result

The output vector where to store the convex hull.

ECodedElement.ComputeFeretBox

Computes the Feret box at a specific orientation.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox ComputeFeretBox(
 float angle
 )
```

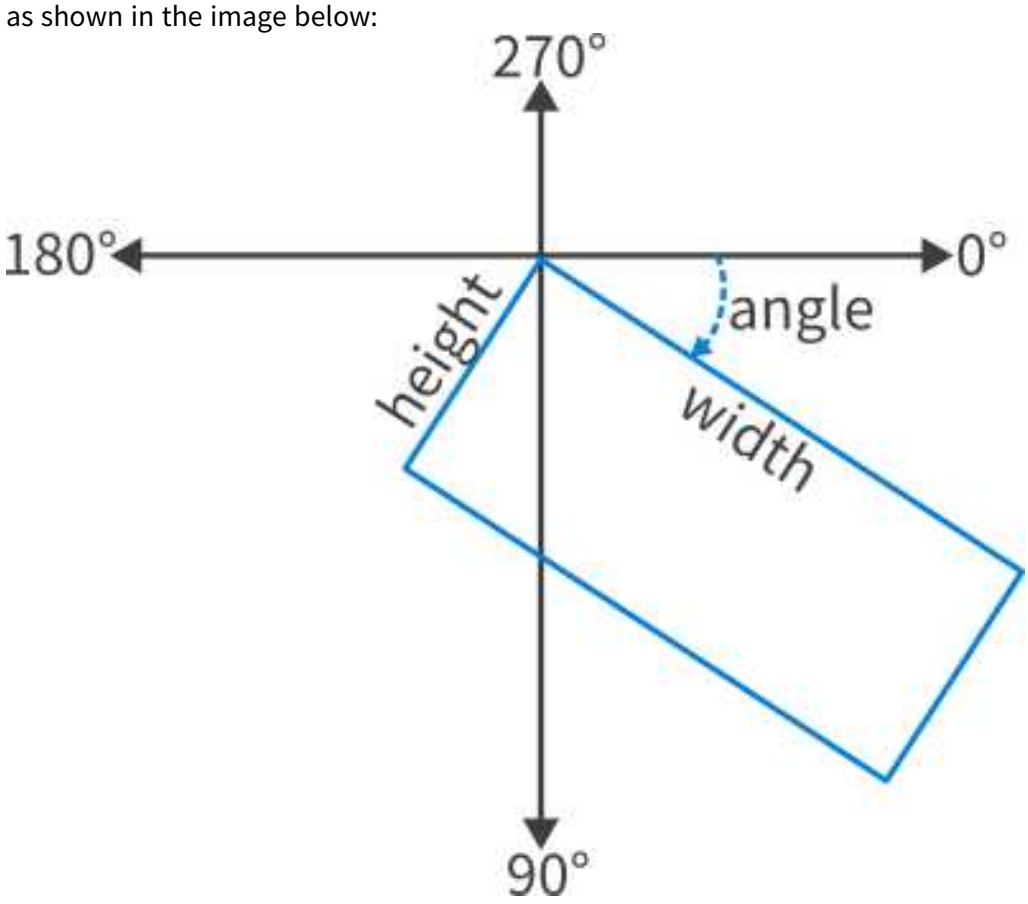
Parameters

angle

The orientation of interest (in the current angle units).

Remarks

The angle of the Feret box is the angle made between the X-axis and the width side of the box as shown in the image below:



ECodedElement.ComputePixelGrayAverage

Computes the average gray-level value of the pixels of a given image over the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
float ComputePixelGrayAverage(
 Euresys.Open_eVision.EROIBW8 image
 )
```

Parameters

image

The input image.

ECodedElement.ComputePixelGrayDeviation

Computes the standard deviation of the gray-level values of a given image over the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
float ComputePixelGrayDeviation(
 Euresys.Open_eVision.EROIBW8 image
 )
```

Parameters

image

The input image.

ECodedElement.ComputePixelGrayVariance

Computes the variance of the gray-level values of a given image over the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
double ComputePixelGrayVariance(
 Euresys.Open_eVision.EROIBW8 image
 )
```

Parameters

image

The input image.

ECodedElement.ComputePixelMax

Computes the maximum gray level of the pixels of a given image over the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW8 ComputePixelMax(
 Euresys.Open_eVision.EROIBW8 image
 )
```

Parameters

image

The input image.

ECodedElement.ComputePixelMin

Computes the minimum gray level of the pixels of a given image over the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW8 ComputePixelMin(
 Euresys.Open_eVision.EROIBW8 image
 )
```

Parameters

image

The input image.

ECodedElement.ComputeWeightedGravityCenter

Computes the gravity center of a given image over the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint ComputeWeightedGravityCenter(
 Euresys.Open_eVision.EROIBW8 image
 )
```

Parameters

image

The input image.

ECodedElement.Contour

Returns the coordinates of the starting point of the countour of the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Contour
  { get; }
```

Remarks

More precisely, the leftmost pixel over the topmost row of the coded element is taken into consideration.

ECodedElement.ContourPath

Returns the contour path.
The contour paths is computed using EContourMode_ClockwiseAlwaysClosed.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPathVector ContourPath
  { get; }
```

ECodedElement.ContourX

Returns the abscissa of the starting point of the countour of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
int ContourX
  { get; }
```

ECodedElement.ContourY

Returns the ordinate of the starting point of the countour of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
int ContourY
  { get; }
```

ECodedElement.ConvexHull

Gets the convex hull of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPathVector ConvexHull
  { get; }
```

ECodedElement.Eccentricity

Returns the eccentricity of the ellipse of inertia.

Namespace: Euresys.Open_eVision

[C#]

```
float Eccentricity
  { get; }
```

Remarks

The ellipse of inertia is defined as the ellipse that has the same second order moments as the original coded element. The eccentricity is zero for circular objects and one for a line-shaped objects.

ECodedElement.ElementIndex

Returns the index of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
uint ElementIndex
  { get; }
```

Remarks

If the coded element is an object, its index is relative to the layer to which it belongs. If the coded element is a hole, its index is relative to its parent object.

ECodedElement.EllipseAngle

Returns the angle of the ellipse of inertia.

Namespace: Euresys.Open_eVision

[C#]

```
float EllipseAngle
  { get; }
```

Remarks

The ellipse of inertia is defined as the ellipse that has the same second order moments as the original coded element.

ECodedElement.EllipseHeight

Returns the length of the short axis of the ellipse of inertia.

Namespace: Euresys.Open_eVision

```
[C#]
float EllipseHeight
  { get; }
```

Remarks

The ellipse of inertia is defined as the ellipse that has the same second order moments as the original coded element.

ECodedElement.EllipseWidth

Returns the length of the long axis of the ellipse of inertia.

Namespace: Euresys.Open_eVision

```
[C#]
float EllipseWidth
  { get; }
```

Remarks

The ellipse of inertia is defined as the ellipse that has the same second order moments as the original coded element.

ECodedElement.FeretBox22Box

Returns the Feret box at orientation 22.5 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox FeretBox22Box
  { get; }
```

ECodedElement.FeretBox22Center

Returns the coordinates of the center of the Feret box oriented at 22.5 degrees.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint FeretBox22Center
  { get; }
```

ECodedElement.FeretBox22CenterX

Returns the abscissa of the center of the Feret box oriented at 22.5 degrees.

Namespace: Euresys.Open_eVision

[C#]

```
float FeretBox22CenterX
  { get; }
```

ECodedElement.FeretBox22CenterY

Returns the ordinate of the center of the Feret box oriented at 22.5 degrees.

Namespace: Euresys.Open_eVision

[C#]

```
float FeretBox22CenterY
  { get; }
```

ECodedElement.FeretBox22Height

Returns the height of the Feret box oriented at 22.5 degrees (Feret diameter at 112.5 degrees).

Namespace: Euresys.Open_eVision

[C#]

```
float FeretBox22Height
  { get; }
```

ECodedElement.FeretBox22Width

Returns the width of the Feret box oriented at 22.5 degrees (Feret diameter at 22.5 degrees).

Namespace: Euresys.Open_eVision

[C#]

```
float FeretBox22Width
```

```
{ get; }
```

ECodedElement.FeretBox45Box

Returns the Feret box at orientation 45 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox FeretBox45Box
{ get; }
```

ECodedElement.FeretBox45Center

Returns the coordinates of the center of the Feret box oriented at 45 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint FeretBox45Center
{ get; }
```

ECodedElement.FeretBox45CenterX

Returns the abscissa of the center of the Feret box oriented at 45 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
float FeretBox45CenterX
{ get; }
```

ECodedElement.FeretBox45CenterY

Returns the ordinate of the center of the Feret box oriented at 45 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
float FeretBox45CenterY
{ get; }
```

ECodedElement.FeretBox45Height

Returns the height of the Feret box oriented at 45 degrees (Feret diameter at 135 degrees).

Namespace: Euresys.Open_eVision

[C#]

```
float FeretBox45Height
  { get; }
```

ECodedElement.FeretBox45Width

Returns the width of the Feret box oriented at 45 degrees (Feret diameter at 45 degrees).

Namespace: Euresys.Open_eVision

[C#]

```
float FeretBox45Width
  { get; }
```

ECodedElement.FeretBox68Box

Returns the Feret box at orientation 67.5 degrees.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERotatedBoundingBox FeretBox68Box
  { get; }
```

ECodedElement.FeretBox68Center

Returns the coordinates of the center of the Feret box oriented at 67.5 degrees.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint FeretBox68Center
  { get; }
```

ECodedElement.FeretBox68CenterX

Returns the abscissa of the center of the Feret box oriented at 67.5 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
float FeretBox68CenterX
   { get; }
```

ECodedElement.FeretBox68CenterY

Returns the ordinate of the center of the Feret box oriented at 67.5 degrees.

Namespace: Euresys.Open_eVision

```
[C#]
float FeretBox68CenterY
   { get; }
```

ECodedElement.FeretBox68Height

Returns the height of the Feret box oriented at 67.5 degrees (Feret diameter at 157.5 degrees).

Namespace: Euresys.Open_eVision

```
[C#]
float FeretBox68Height
   { get; }
```

ECodedElement.FeretBox68Width

Returns the width of the Feret box oriented at 67.5 degrees (Feret diameter at 67.5 degrees).

Namespace: Euresys.Open_eVision

```
[C#]
float FeretBox68Width
   { get; }
```

ECodedElement.GetCentralMoment

Computes the central, two-dimensional moment of order (p,q).

Namespace: Euresys.Open_eVision

[C#]

```
float GetCentralMoment(
 uint p,
 uint q
 )
```

Parameters

p

Order of the moment along the X-axis.

q

Order of the moment along the Y-axis.

Remarks

<latex>\mu_{pq} = \sum_{x} \sum_{y} (x - \bar{x})^p(y - \bar{y})^q I(x,y)</latex>

$$\mu_{pq} = \sum_{x} \sum_{y} (x - \bar{x})^p (y - \bar{y})^q I(x, y)$$

ECodedElement.GetMoment

Computes the raw, two-dimensional moment of order (p,q).

Namespace: Euresys.Open_eVision

[C#]

```
double GetMoment(
 uint p,
 uint q
 )
```

Parameters

p

Order of the moment along the X-axis.

q

Order of the moment along the Y-axis.

Remarks

<latex>M_{pq} = \sum_x \sum_y x^p y^q I(x,y)</latex>

$$M_{pq} = \sum_{x} \sum_{y} x^p y^q I(x, y)$$

ECodedElement.GetNormalizedCentralMoment

Computes the scale-invariant, central, two-dimensional moment of order (p,q).

Namespace: Euresys.Open_eVision

[C#]

```
float GetNormalizedCentralMoment(
 uint p,
 uint q
 )
```

Parameters

p

Order of the moment along the X-axis.

q

Order of the moment along the Y-axis.

Remarks

<latex>\eta_{pq} = \frac{\mu_{pq}} {\mu_{00}^{\left(1 + \frac{p+q}{2}\right)}}</latex>

$$\eta_{pq} \frac{\mu_{pq}}{\mu_{00}^{\left(1+\frac{p+q}{2}\right)}}$$

ECodedElement.GravityCenter

Returns the gravity center of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GravityCenter
  { get; }
```

ECodedElement.GravityCenterX

Returns the abscissa of the gravity center of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
float GravityCenterX
  { get; }
```

Remarks

For a coded element E, this value is defined as: <latex>\frac{\sum_{(x,y)\in E} x}{\sum_{(x,y)\in E} 1}</latex>

$$\frac{\sum_{(x,y)\in E} x}{\sum_{(x,y)\in E} 1}$$

ECodedElement.GravityCenterY

Returns the ordinate of the gravity center of the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
float GravityCenterY
   { get; }
```

Remarks

For a coded element E, this value is defined as: <latex>\frac{\sum_{(x,y)\in E} y}{\sum_{(x,y)\in E} 1}</latex> $\frac{\sum_{(x,y)\in E} y}{\sum_{(x,y)\in E} 1}$

ECodedElement.IsCodedElement

Tests whether the coded element is an object, a hole or a coded element.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsCodedElement
   { get; }
```

ECodedElement.IsHole

Tests whether the coded element is an object, a hole or a coded element.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsHole
   { get; }
```

ECodedElement.IsObject

Tests whether the coded element is an object, a hole or a coded element.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsObject
  { get; }
```

ECodedElement.LargestRun

Returns the length of the largest run inside the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
uint LargestRun
  { get; }
```

ECodedElement.LayerIndex

Returns the index of the layer in the coded image to which the coded element belongs.

Namespace: Euresys.Open_eVision

[C#]

```
uint LayerIndex
  { get; }
```

Remarks

If the coded element is a hole, its layer index is defined as that of its parent object.

ECodedElement.LeftLimit

Returns the lowest (integer) X-coordinate of all the pixels of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
int LeftLimit
  { get; }
```

Remarks

For a coded element E, this value is defined as: <latex>\left\lfloor \min \left\{ x \mid (\exists y) (x,y) \in E \right\} \right\rfloor </latex> $\left\lfloor \min \{x \mid (\exists y)\ (x,y) \in E\} \right\rfloor$

ECodedElement.MinimumEnclosingRectangle

Returns the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox MinimumEnclosingRectangle
  { get; }
```

Remarks

The Minimum-Area Enclosing Rectangle is defined as the Feret box with the minimum surface among all the possible orientations.

ECodedElement.MinimumEnclosingRectangleAngle

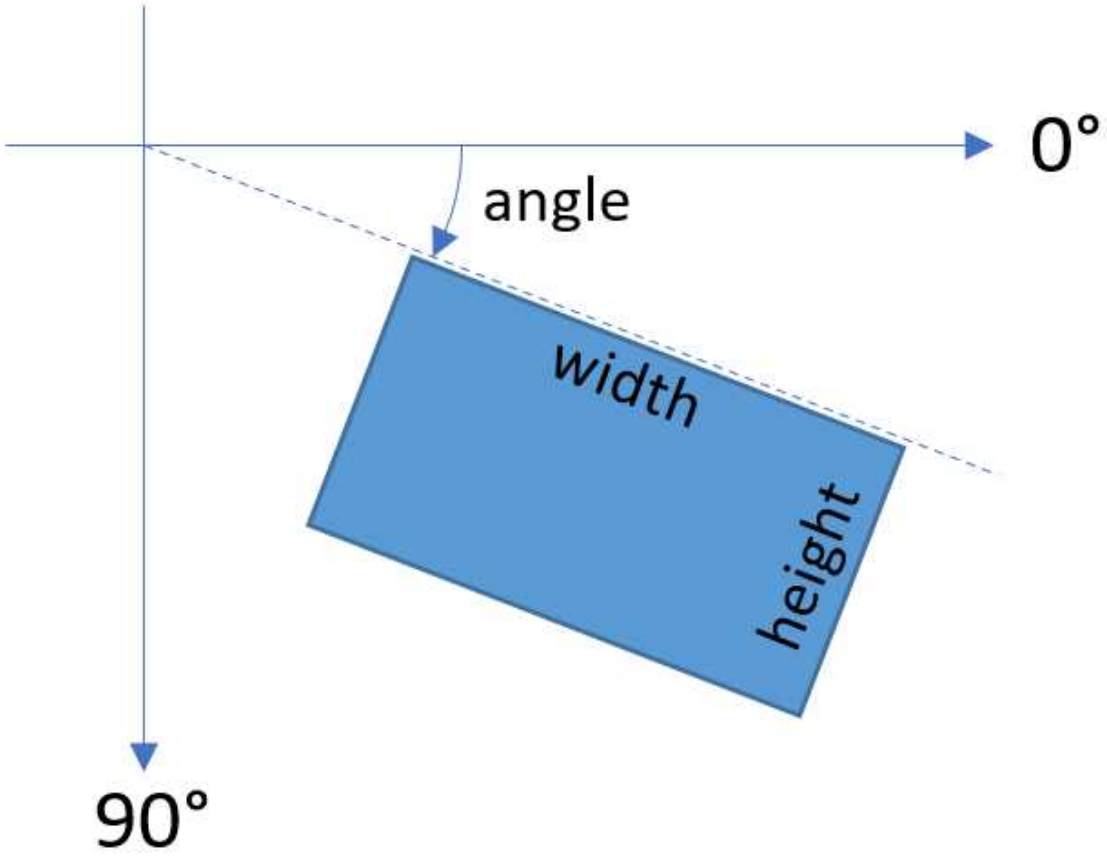
Returns the angle of the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumEnclosingRectangleAngle
  { get; }
```

Remarks

The angle is the angle between the width side of the rectangle and the horizontal. It always lies in the range [0 ; pi/2[.



ECodedElement.MinimumEnclosingRectangleCenter

Returns the coordinates of the center of the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint MinimumEnclosingRectangleCenter
  { get; }
```

ECodedElement.MinimumEnclosingRectangleCenterX

Returns the abscissa of the center of the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumEnclosingRectangleCenterX
```

```
{ get; }
```

ECodedElement.MinimumEnclosingRectangleCenterY

Returns the ordinate of the center of the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumEnclosingRectangleCenterY
  { get; }
```

ECodedElement.MinimumEnclosingRectangleHeight

Returns the height of the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumEnclosingRectangleHeight
  { get; }
```

ECodedElement.MinimumEnclosingRectangleWidth

Returns the width of the Minimum-Area Enclosing Rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumEnclosingRectangleWidth
  { get; }
```

ECodedElement.operator==

-

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ECodedElement other
 )
```

Parameters

other

-

ECodedElement.RenderMask

Creates a Flexible Mask from the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
void RenderMask(
 Euresys.Open_eVision.EROIBW8 destination,
 int offsetX,
 int offsetY
 )
void RenderMask(
 Euresys.Open_eVision.EROIBW8 destination
 )
```

Parameters

destination

The image in which the generated mask will be stored.

offsetX

The X-offset that must be applied to bring the zero X-coordinate in the coded image on the first column of the result image (defaults to zero).

offsetY

The Y-offset that must be applied to bring the zero Y-coordinate in the coded image on the first row of the result image (defaults to zero).

Remarks

The size of the result image will not be changed: It must be properly sized beforehand.

ECodedElement.RightLimit

Returns the highest (integer) X-coordinate of all the pixels of the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
int RightLimit
  { get; }
```

Remarks

For a coded element E, this value is defined as: <latex>\left\lceil \max \left\{ x \mid (\exists y) (x,y) \in E \right\} \right\rceil </latex> $\left\lceil \max \{x \mid (\exists y)\ (x,y) \in E\} \right\rceil$

ECodedElement.RunCount

Returns the number of runs inside the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
uint RunCount
  { get; }
```

ECodedElement.RunsIterator

Returns an iterator to the runs of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObjectRunsIterator RunsIterator
  { get; }
```

ECodedElement.SigmaX

Returns the centered moment of inertia around X (average squared X-deviation).

Namespace: Euresys.Open_eVision

[C#]

```
float SigmaX
  { get; }
```

ECodedElement.SigmaXX

Returns the centered cross moment of inertia (average X-deviation * Y-deviation).

Namespace: Euresys.Open_eVision

[C#]

```
float SigmaXX
  { get; }
```

ECodedElement.SigmaXY

Returns the reduced, centered moment of inertia (around the principal inertia axis).

Namespace: Euresys.Open_eVision

```
[C#]
float SigmaXY
  { get; }
```

ECodedElement.SigmaY

Returns the centered moment of inertia around Y (average squared Y-deviation).

Namespace: Euresys.Open_eVision

```
[C#]
float SigmaY
  { get; }
```

ECodedElement.SigmaYY

Returns the reduced, centered moment of inertia (around the secondary inertia axis).

Namespace: Euresys.Open_eVision

```
[C#]
float SigmaYY
  { get; }
```

ECodedElement.TopLimit

Returns the lowest (integer) Y-coordinate of all the pixels of the coded element.

Namespace: Euresys.Open_eVision

```
[C#]
int TopLimit
  { get; }
```

Remarks

For a coded element E, this value is defined as: <latex>\left\lfloor \min \left\{ y \mid (\exists x) (x,y) \in E \right\} \right\rfloor </latex> $\lfloor \min \{y \mid (\exists x)\ (x,y) \in E\} \rfloor$

ECodedElement.ToRegion

Creates an ERegion from the ECodedElement. The ERegion represents all the pixels which are within the bounding box of the Pattern.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion ToRegion(
 )
```

4.61. ECodedImage Class

This class is deprecated.

This class handles runs, objects and features in EasyObject.

Remarks

These entities are stored into three separate dynamic lists for efficient storage. This class pertains to the EasyObject legacy API and should not be used for new developments. It has been replaced by ECodedImage2.

Namespace: Euresys.Open_eVision

Properties

BlackClass	Black class index (below the lower threshold).
Connexity	Connexity mode, that is how neighboring pixels are considered to belong to the same objects.
Continuous	Flag indicating whether the objects have to be built in the continuous mode or in the normal mode.
CurrentObjPtr	Pointer to the current objects list item, or NULL.
CurrentRunPtr	Pointer to the current run list item, or NULL.
DrawDiagonals	Flag indicating whether the limit rectangle diagonals must be drawn or not.
FirstObjPtr	Pointer to the first objects list item, or NULL.
HighColorThreshold	Upper threshold (color) used for image segmentation.
HighImage	Image used as an adaptive upper threshold.
HighThreshold	Upper threshold (gray level) used for image segmentation.
LastObjPtr	Pointer to the last objects list item, or NULL.
LimitAngle	Angle of the skewed bounding box feature, in the current angle unit.
LowColorThreshold	Lower threshold (color) used for image segmentation.
LowImage	Image used as an adaptive lower threshold.

LowThreshold	Lower threshold (gray level) used for image segmentation.
MaxObjects	Maximum number of objects to look for.
NeutralClass	Neutral class index (between both thresholds).
NumFeatures	Number of features currently in use.
NumHoleRuns	Total number of hole runs in the list of object runs.
NumObjects	Number of objects in the coded image.
NumRuns	Total number of runs in the list of object runs.
NumSelectedObjects	Number of objects currently selected.
Threshold	Threshold mode (gray level) used for image segmentation.
ThresholdImage	Single threshold used for image segmentation.
TrueThreshold	Absolute threshold level, when using a single threshold.
WhiteClass	White class index (above the upper threshold).

Methods

AddFeat	Adds a feature to the list of features.
AnalyseObjects	After an image segmentation (see ECodedImage::BuildObjects), computes the values of given "features", i.e. geometric parameters.
BlankFeatures	Resets all values of all features.
BuildHoles	Creates holes.
BuildLabeledObjects	Segments an image into connected blobs comprised of pixels of the same class.
BuildLabeledRuns	Extracts the runs from the image by comparing adjacent pixel values.
BuildObjects	Groups runs to form separated objects (connected blobs), from runs detected by ECodedImage::BuildRuns or from a source image/ROI.
BuildRuns	Converts the specified ROI to classes, and extracts the runs from it.
DrawObject	Draws the designated object in solid color.
DrawObjectFeature	Draws a graphical representation of a feature of the designated object in solid color.
DrawObjectFeatureWithCurrentPen	Draws a graphical representation of a feature of the designated object in solid color.
DrawObjects	Draws all objects in solid color.
DrawObjectsFeature	Draws a graphical representation of a feature.
DrawObjectsFeatureWithCurrentPen	Draws a graphical representation of a feature.
DrawObjectsWithCurrentPen	Draws all objects in solid color.
DrawObjectWithCurrentPen	Draws the designated object in solid color.

ECodedImage	Constructs a void coded image.
FeatureAverage	Computes the average of the features of all currently selected objects.
FeatureDeviation	Computes the average and standard deviation of the features of all currently selected objects.
FeatureMaximum	Computes the maximum of the features of all currently selected objects.
FeatureMinimum	Computes the minimum of the features of all currently selected objects.
FeatureVariance	Computes the average and variance of the features of all currently selected objects.
GetCurrentObjData	Returns the data of the current object.
GetCurrentRunData	Returns the data of the current run.
GetFeatData	Gets the EFeatureData associated to a given feature list item.
GetFeatDataSize	Returns the data size of the specified feature.
GetFeatDataType	Returns the data type of the specified feature.
GetFeatNum	Returns the code number of the specified feature.
GetFeatPtrByNum	Returns a pointer to the feature list item for a given feature number, or NULL.
GetFeatSize	Returns the size (number of elements) of the feature array for the specified feature.
GetFirstHole	Returns a pointer to the first hole related to the specified object.
GetFirstObjData	Moves the cursor to the first object and returns the associated data.
GetFirstRunData	Moves the cursor to the first run and returns the associated data.
GetFirstRunPtr	Pointer to the first run list item, or NULL.
GetHoleParentObject	Returns a pointer to the real object including the specified hole.
GetLastObjData	Moves the cursor to the last object and returns the associated data.
GetLastRunData	Moves the cursor to the last run and returns the associated data.
GetLastRunPtr	Pointer to the last run list item, or NULL.
GetNextHole	Returns a pointer to the hole following the specified hole, in the objects list.
GetNextObjData	Moves the cursor to the next object and returns the associated data.
GetNextObjPtr	Returns a pointer to the next objects list item, or NULL.
GetNextRunData	Moves the cursor to the next run and returns the associated data.
GetNextRunPtr	Returns a pointer to the next run list item, or NULL.
GetNumHoles	Returns the number of holes related to the specified object.
GetNumObjectRuns	Returns the number of runs comprised in a given object.
GetObjDataPtr	Gets the EObjectData associated to a given objects list item.

GetObjectData	If an object identification number is given, moves the cursor to the object with a given identification number and returns the associated data. If a list item is given, returns the object data associated with an object list item (cf. EListItem). See also ECodedImage::GetCurrentObjData.
GetObjectFeature	Allows retrieving the value of a feature of a given object.
GetObjFirstRunPtr	Returns a pointer to the first run list item of an object.
GetObjLastRunPtr	Returns a pointer to the last run list item of an object.
GetObjPtr	Returns a pointer to the given objects list item.
GetObjPtrByCoordinates	Returns a pointer to the objects list item that contains the point of given coordinates, or NULL.
GetObjPtrByPos	Returns a pointer to the objects list item of given absolute position, or NULL.
GetPreviousObjData	Moves the cursor to the previous object and returns the associated data.
GetPreviousObjPtr	Returns a pointer to the previous objects list item, or NULL.
GetPreviousRunData	Moves the cursor to the previous run and returns the associated data.
GetPreviousRunPtr	Returns a pointer to the previous run list item, or NULL.
GetRunData	Returns the run data associated to the specified run.
GetRunDataPtr	Gets the ERunData associated to a given run list item.
GetRunPtr	Returns a pointer to the run list item of given absolute position, or NULL.
GetRunPtrByCoordinates	Returns a pointer to the run list item that contains the point of given coordinates, or NULL.
IsHole	Returns true if the specified object is a hole, false otherwise.
IsObjectSelected	Sets bSelected to true if an object is selected.
ObjectConvexHull	Computes the convex hull of an object and stores it in a EPathVector.
RemoveAllFeats	Deletes all features from the features list.
RemoveAllObjects	Deletes all objects from the objects list.
RemoveAllRuns	Deletes all runs from the runs list.
RemoveHoles	Permanently erases, from the objects list, holes related to the specified object.
RemoveObject	Deletes an object from the objects list.
RemoveRun	Deletes a run from the runs list.
ResetContinuousMode	When the continuous mode is activated, this method resets the sequence of images.
SelectAllObjects	Selects all objects.
SelectHoles	Selects the holes related to the specified object.
SelectObject	Selects an object.

SelectObjectsUsingFeature	Selects or deselects objects, according to the value of a specified feature.
SelectObjectsUsingPosition	Selects or deselects objects, using a delimiting rectangle.
SetFeatInfo	Sets the appropriate data size and type for a predefined feature.
SetFirstRunPtr	Sets the first run list item of an object.
SetLastRunPtr	Sets the last run list item of an object.
SortObjectsUsingFeature	Sorts objects according to the value of some feature.
UnselectAllObjects	Deselects all objects.
UnselectHoles	Unselects the holes related to the specified object.
UnselectObject	Deselects an object.

ECodedImage.AddFeat

This method is deprecated.

Adds a feature to the list of features.

Namespace: Euresys.Open_eVision

```
[C#]
void AddFeat(
 ref Euresys.Open_eVision.EFeatureData feature,
 int numberOfObjects
 )
```

Parameters

feature

Pointer to an EFeatureData describing the feature.

numberOfObjects

Number of objects for which the feature will be stored.

ECodedImage.AnalyseObjects

This method is deprecated.

After an image segmentation (see ECodedImage::BuildObjects), computes the values of given "features", i.e. geometric parameters.

Namespace: Euresys.Open_eVision

[C#]

```
void AnalyseObjects(
 Euresys.Open_eVision.ELegacyFeature feature1,
 Euresys.Open_eVision.ELegacyFeature feature2,
 Euresys.Open_eVision.ELegacyFeature feature3,
 Euresys.Open_eVision.ELegacyFeature feature4,
 Euresys.Open_eVision.ELegacyFeature feature5,
 Euresys.Open_eVision.ELegacyFeature feature6,
 Euresys.Open_eVision.ELegacyFeature feature7,
 Euresys.Open_eVision.ELegacyFeature feature8,
 Euresys.Open_eVision.ELegacyFeature feature9,
 Euresys.Open_eVision.ELegacyFeature feature10
 )
```

Parameters

feature1
Feature code, as defined by ELegacyFeature.

feature2
Feature code, as defined by ELegacyFeature.

feature3
Feature code, as defined by ELegacyFeature.

feature4
Feature code, as defined by ELegacyFeature.

feature5
Feature code, as defined by ELegacyFeature.

feature6
Feature code, as defined by ELegacyFeature.

feature7
Feature code, as defined by ELegacyFeature.

feature8
Feature code, as defined by ELegacyFeature.

feature9
Feature code, as defined by ELegacyFeature.

feature10
Feature code, as defined by ELegacyFeature.

ECodedImage.BlackClass

This property is deprecated.

Black class index (below the lower threshold).

Namespace: Euresys.Open_eVision

[C#]

```
short BlackClass
```

```
{ get; set; }
```

Remarks

Non zero when the black runs (below the lower threshold) are coded. 0 means "do not code this class". <!-- 1 by default. -->

ECodedImage.BlankFeatures

This method is deprecated.

Resets all values of all features.

Namespace: Euresys.Open_eVision

[C#]

```
void BlankFeatures(
 )
```

ECodedImage.BuildHoles

This method is deprecated.

Creates holes.

Namespace: Euresys.Open_eVision

[C#]

```
void BuildHoles(
 )

void BuildHoles(
 Euresys.Open_eVision.EListItem object_
 )
```

Parameters

*object_*

Pointer to the objects list item, for which the holes have to be computed.

Remarks

If no argument, the holes are related to all the previously selected real objects. If holes already exist (resulting from a previous call to the ECodedImage::BuildHoles function), they will be removed from the objects list before the new hole building. Otherwise, the holes are related only to the specified object. Previously created holes are not removed before the new holes are built. If holes related to object have already been constructed, they won't be recreated. If object is a hole or is NULL, no hole will be built. The newly created holes will be added to the list of the objects found in the image. Building holes requires two preliminary steps: the construction of real objects and the selection of objects on which the hole detection has to be performed. At the end of the object construction, all the objects are selected.

ECodedImage.BuildLabeledObjects

This method is deprecated.

Segments an image into connected blobs comprised of pixels of the same class.

Namespace: Euresys.Open_eVision

```
[C#]
void BuildLabeledObjects(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void BuildLabeledObjects(
 Euresys.Open_eVision.EROIBW16 sourceImage
 )
```

Parameters

sourceImage

Pointer to a source ROI.

Remarks

Uses EBW8 (EBW16) information for class indices, i.e. 255 (65,535) possible classes. Class 0 is not coded. Building objects is the process of grouping pixels from an image to form connected blobs. The pixels are assigned class indices based either on thresholding (ECodedImage::BuildObjects) or on the pixel values themselves (BuildLabeledObjects). A blob is a set of connected pixels of the same class.

ECodedImage.BuildLabeledRuns

This method is deprecated.

Extracts the runs from the image by comparing adjacent pixel values.

Namespace: Euresys.Open_eVision

```
[C#]
void BuildLabeledRuns(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void BuildLabeledRuns(
 Euresys.Open_eVision.EROIBW16 sourceImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

Remarks

Uses EBW8 (EBW16) information for class indices, i.e. 255 (65,535) possible classes. Class 0 is not coded. Building runs is the process of grouping pixels from an image to form horizontal segments. The pixels are assigned class indices based either on thresholding (ECodedImage::BuildRuns) or on the pixel values themselves (BuildLabeledRuns). A run is a set of horizontally connected pixels of the same class.

ECodedImage.BuildObjects

This method is deprecated.

Groups runs to form separated objects (connected blobs), from runs detected by ECodedImage::BuildRuns or from a source image/ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void BuildObjects(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )

void BuildObjects(
 Euresys.Open_eVision.EROIC24 sourceImage
 )

void BuildObjects(
 )

void BuildObjects(
 Euresys.Open_eVision.EROIBW1 sourceImage
 )
```

Parameters

sourceImage

Pointer to a source ROI.

Remarks

Without argument, the method groups the runs detected by ECodedImage::BuildRuns to form separate objects, i.e. connected components. With a source ROI as argument, the method segments it into connected blobs comprised of pixels of the same class. The EROIBW8 parameter is converted to white/neutral/black classes, using two thresholds. The EROIC24 parameter is converted to white/black classes, using two color thresholds. Then, the method extracts runs from them, and groups the runs to form separate objects, i.e. connected components. Building objects is the process of grouping pixels from an image to form connected blobs. The pixels are assigned class indices based either on thresholding (BuildObjects) or on the pixel values themselves (ECodedImage::BuildLabeledObjects). A blob is a set of connected pixels of the same class.

ECodedImage.BuildRuns

This method is deprecated.

Converts the specified ROI to classes, and extracts the runs from it.

Namespace: Euresys.Open_eVision

[C#]

```
void BuildRuns(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void BuildRuns(
 Euresys.Open_eVision.EROIC24 sourceImage
 )
void BuildRuns(
 Euresys.Open_eVision.EROIBW1 sourceImage
 )
```

Parameters

sourceImage

Pointer to the source ROI.

Remarks

The EROIBW8 parameter is converted to white/neutral/black classes, using two thresholds. The EROIC24 parameter is converted to white/black classes, using two color thresholds. Then, the method extracts runs from them. Building runs is the process of grouping pixels from an image to form horizontal segments. The pixels are assigned class indices based either on thresholding (BuildRuns) or on the pixel values themselves (ECodedImage::BuildLabeledRuns). A run is a set of horizontally connected pixels of the same class.

ECodedImage.Connexity

This property is deprecated.

Connexity mode, that is how neighboring pixels are considered to belong to the same objects.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EConnexity Connexity
  { get; set; }
```

ECodedImage.Continuous

This property is deprecated.

Flag indicating whether the objects have to be built in the continuous mode or in the normal mode.

Namespace: Euresys.Open_eVision

[C#]

```
bool Continuous
  { get; set; }
```

Remarks

true if objects are built in the continuous mode, false if objects are built in the normal mode.

ECodedImage.CurrentObjPtr

This property is deprecated.

Pointer to the current objects list item, or NULL.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem CurrentObjPtr
  { get; }
```

ECodedImage.CurrentRunPtr

This property is deprecated.

Pointer to the current run list item, or NULL.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem CurrentRunPtr
  { get; }
```

ECodedImage.DrawDiagonals

This property is deprecated.

Flag indicating whether the limit rectangle diagonals must be drawn or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool DrawDiagonals
  { get; set; }
```

Remarks

If true (default), diagonals are drawn.

ECodedImage.DrawObject

This method is deprecated.

Draws the designated object in solid color.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObject(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 IntPtr graphicContext,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 IntPtr graphicContext,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawObject(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObject(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

objectNumber

Number of the object to be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

*object_*

Pointer to the list item (from the objects list) corresponding to the object to be drawn.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. The objects can be specified either by number of by list pointer. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjectFeature

This method is deprecated.

Draws a graphical representation of a feature of the designated object in solid color.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObjectFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.ELegacyFeature feature,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

feature

Feature to be drawn, as defined by ELegacyFeature (use any value matching the aforementioned features, f.i. EllipseWidth will draw the ellipse of inertia).

objectNumber

Number of the object to be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

*object_*

Pointer to the list item (from the objects list) corresponding to the object to be drawn.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. The objects can be specified either by number of by list pointer. If a required feature has not been computed for some object, nothing is drawn and no error message is issued! Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjectFeatureWithCurrentPen

This method is deprecated.

Draws a graphical representation of a feature of the designated object in solid color.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObjectFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

feature

Feature to be drawn, as defined by ELegacyFeature (use any value matching the aforementioned features, f.i. EllipseWidth will draw the ellipse of inertia).

objectNumber

Number of the object to be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. The objects can be specified either by number of by list pointer. If a required feature has not been computed for some object, nothing is drawn and no error message is issued! Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjects

This method is deprecated.

Draws all objects in solid color.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjects(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObjects(
 IntPtr graphicContext,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObjects(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

selectionFlag

Tells how the selected/unselected state of the objects is handled, as defined by ESelectionFlag.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all objects (to vary the colors, draw the objects separately using the ECodedImage::DrawObject method instead). Optionally, only the selected or deselected objects can be drawn. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjectsFeature

This method is deprecated.

Draws a graphical representation of a feature.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawObjectsFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObjectsFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObjectsFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

feature

Feature to be drawn, as defined by ELegacyFeature (use any value matching the aforementioned features, f.i. EllipseWidth will draw the ellipse of inertia).

selectionFlag

Tells how the selected/unselected state of the objects is handled, as defined by ESelectionFlag.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all objects (to vary the colors, draw the objects separately using the ECodedImage::DrawObjectFeature method instead). Optionally, only the selected or deselected objects can be drawn. Only the following features can be drawn: * GravityCenter: upright cross; * Centroid: skewed cross; * Limit: upright bounding rectangle with diagonals; * Limit45: skewed bounding rectangle with diagonals; * EllipseWidth: ellipse of inertia (edge and main axis). If a required feature has not been computed for some object, nothing is drawn and no error message is issued! Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjectsFeatureWithCurrentPen

This method is deprecated.

Draws a graphical representation of a feature.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectsFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

feature

Feature to be drawn, as defined by ELegacyFeature (use any value matching the aforementioned features, f.i. EllipseWidth will draw the ellipse of inertia).

selectionFlag

Tells how the selected/unselected state of the objects is handled, as defined by ESelectionFlag.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all objects (to vary the colors, draw the objects separately using the ECodedImage::DrawObjectFeature method instead). Optionally, only the selected or deselected objects can be drawn. Only the following features can be drawn: * GravityCenter: upright cross; * Centroid: skewed cross; * Limit: upright bounding rectangle with diagonals; * Limit45: skewed bounding rectangle with diagonals; * EllipseWidth: ellipse of inertia (edge and main axis). If a required feature has not been computed for some object, nothing is drawn and no error message is issued! Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjectsWithCurrentPen

This method is deprecated.

Draws all objects in solid color.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectsWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.ESelectionFlag selectionFlag,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

selectionFlag

Tells how the selected/unselected state of the objects is handled, as defined by ESelectionFlag.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all objects (to vary the colors, draw the objects separately using the ECodedImage::DrawObject method instead). Optionally, only the selected or deselected objects can be drawn. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.DrawObjectWithCurrentPen

This method is deprecated.

Draws the designated object in solid color.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectWithCurrentPen(
 IntPtr graphicContext,
 int objectNumber,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawObjectWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EListItem object_,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

objectNumber
Number of the object to be drawn.

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY
Vertical panning value expressed in pixels. By default, no panning occurs.

*object_*
Pointer to the list item (from the objects list) corresponding to the object to be drawn.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. The objects can be specified either by number of by list pointer. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage.ECodedImage

This method is deprecated.

Constructs a void coded image.

Namespace: Euresys.Open_eVision

```
[C#]
void ECodedImage(
 )
```

ECodedImage.FeatureAverage

This method is deprecated.

Computes the average of the features of all currently selected objects.

Namespace: Euresys.Open_eVision

```
[C#]
void FeatureAverage(
 Euresys.Open_eVision.ELegacyFeature feature,
 out float average
 )
```

Parameters

feature

Feature code, as defined by ELegacyFeature.

average

Reference to the feature average.

Remarks

This measures the central tendency of a population of objects.

ECodedImage.FeatureDeviation

This method is deprecated.

Computes the average and standard deviation of the features of all currently selected objects.

Namespace: Euresys.Open_eVision

```
[C#]
void FeatureDeviation(
 Euresys.Open_eVision.ELegacyFeature feature,
 out float average,
 out float deviation
 )
```

Parameters

feature

Feature code, as defined by ELegacyFeature.

average

Reference to the feature average.

deviation

Reference to the feature standard deviation.

ECodedImage.FeatureMaximum

This method is deprecated.

Computes the maximum of the features of all currently selected objects.

Namespace: Euresys.Open_eVision

[C#]

```
void FeatureMaximum(
 Euresys.Open_eVision.ELegacyFeature feature,
 out float maximum
 )
```

Parameters

feature

Feature code, as defined by ELegacyFeature.

maximum

Reference to the feature maximum.

ECodedImage.FeatureMinimum

This method is deprecated.

Computes the minimum of the features of all currently selected objects.

Namespace: Euresys.Open_eVision

[C#]

```
void FeatureMinimum(
 Euresys.Open_eVision.ELegacyFeature feature,
 out float minimum
 )
```

Parameters

feature

Feature code, as defined by ELegacyFeature.

minimum

Reference to the feature minimum.

ECodedImage.FeatureVariance

This method is deprecated.

Computes the average and variance of the features of all currently selected objects.

Namespace: Euresys.Open_eVision

[C#]

```
void FeatureVariance(
 Euresys.Open_eVision.ELegacyFeature feature,
 out float average,
 out float variance
 )
```

Parameters

feature
Feature code, as defined by ELegacyFeature.

average
Reference to the feature average.

variance
Reference to the feature variance.

Remarks

This measures the central tendency and the dispersion of a population of objects.

ECodedImage.FirstObjPtr

This property is deprecated.

Pointer to the first objects list item, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem FirstObjPtr
  { get; }
```

ECodedImage.GetCurrentObjData

This method is deprecated.

Returns the data of the current object.

Namespace: Euresys.Open_eVision

```
[C#]
void GetCurrentObjData(
 out Euresys.Open_eVision.EObjectData objectData
 )
```

Parameters

objectData
Pointer to an EObjectData structure to receive the data.

Remarks

ECodedImage.GetCurrentRunData

This method is deprecated.

Returns the data of the current run.

Namespace: Euresys.Open_eVision

```
[C#]
void GetCurrentRunData(
 out Euresys.Open_eVision.ERunData run
 )
```

Parameters

run

Pointer to an ERunData to receive the data.

ECodedImage.GetFeatData

This method is deprecated.

Gets the EFeatureData associated to a given feature list item.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetFeatData(
 Euresys.Open_eVision.EListItem currentFeature,
 out Euresys.Open_eVision.EFeatureData featureData
 )
```

Parameters

currentFeature

Pointer to the feature list item.

featureData

Pointer to a EFeatureData to receive the data.

ECodedImage.GetFeatDataSize

This method is deprecated.

Returns the data size of the specified feature.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EDataSize GetFeatDataSize(
 int position
 )

Euresys.Open_eVision.EDataSize GetFeatDataSize(
 Euresys.Open_eVision.EListItem currentFeature
 )
```

Parameters

position

Absolute position in the features list, counting from 0 on.

currentFeature

Pointer to the feature list item.

Remarks

The features data sizes are defined in EDataSize.

ECodedImage.GetFeatDataType

This method is deprecated.

Returns the data type of the specified feature.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EDataType GetFeatDataType(
 int position
 )

Euresys.Open_eVision.EDataType GetFeatDataType(
 Euresys.Open_eVision.EListItem currentFeature
 )
```

Parameters

position

Absolute position in the features list, counting from 0 on.

currentFeature

Pointer to the feature list item.

Remarks

The features data types are defined in EDataType.

ECodedImage.GetFeatNum

This method is deprecated.

Returns the code number of the specified feature.

Namespace: Euresys.Open_eVision

[C#]

```
int GetFeatNum(
 int position
 )
```

```
int GetFeatNum(
 Euresys.Open_eVision.EListItem currentFeature
 )
```

Parameters

position

Absolute position in the features list, counting from 0 on.

currentFeature

Pointer to the feature list item.

Remarks

The features code numbers are defined in ELegacyFeature.

ECodedImage.GetFeatPtrByNum

This method is deprecated.

Returns a pointer to the feature list item for a given feature number, or NULL.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem GetFeatPtrByNum(
 int numFeat
 )
```

Parameters

numFeat

Feature number, as defined by ELegacyFeature.

ECodedImage.GetFeatSize

This method is deprecated.

Returns the size (number of elements) of the feature array for the specified feature.

Namespace: Euresys.Open_eVision

[C#]

```
int GetFeatSize(
 int position
 )

int GetFeatSize(
 Euresys.Open_eVision.EListItem currentFeature
 )
```

Parameters

position

Absolute position in the features list, counting from 0 on.

currentFeature

Pointer to the feature list item.

ECodedImage.GetFirstHole

This method is deprecated.

Returns a pointer to the first hole related to the specified object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetFirstHole(
 Euresys.Open_eVision.EListItem parentObject
 )
```

Parameters

parentObject

Pointer to the objects list item, for which the first hole has to be pointed out.

Remarks

If parentObject refers to a hole (instead of a real object) or to an object comprising no hole, the ECodedImage::GetFirstHole function returns NULL.

ECodedImage.GetFirstObjData

This method is deprecated.

Moves the cursor to the first object and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetFirstObjData(
 out Euresys.Open_eVision.EObjectData object_
 )
```

Parameters

*object_*

Pointer to an EObjectData to receive the data.

Remarks

ECodedImage.GetFirstRunData

This method is deprecated.

Moves the cursor to the first run and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetFirstRunData(
 out Euresys.Open_eVision.ERunData run
 )
```

Parameters

run

Pointer to an ERunData to receive the data.

ECodedImage.GetFirstRunPtr

This method is deprecated.

Pointer to the first run list item, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetFirstRunPtr(
 )
```

ECodedImage.GetHoleParentObject

This method is deprecated.

Returns a pointer to the real object including the specified hole.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetHoleParentObject(
 Euresys.Open_eVision.EListItem hole
 )
```

Parameters

hole

Pointer to the hole list item, for which the parent object has to be pointed out.

ECodedImage.GetLastObjData

This method is deprecated.

Moves the cursor to the last object and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetLastObjData(
 out Euresys.Open_eVision.EObjectData object_
 )
```

Parameters

*object_*

Pointer to an EObjectData structure to receive the data.

ECodedImage.GetLastRunData

This method is deprecated.

Moves the cursor to the last run and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetLastRunData(
 out Euresys.Open_eVision.ERunData run
 )
```

Parameters

run

Pointer to an ERunData to receive the data.

ECodedImage.GetLastRunPtr

This method is deprecated.

Pointer to the last run list item, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetLastRunPtr(
 )
```

ECodedImage.GetNextHole

This method is deprecated.

Returns a pointer to the hole following the specified hole, in the objects list.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetNextHole(
 Euresys.Open_eVision.EListItem hole
 )
```

Parameters

hole

Pointer to the hole list item, for which the following hole has to be pointed out.

Remarks

If there is no hole yet in the list, the ECodedImage::GetNextHole function returns NULL.

ECodedImage.GetNextObjData

This method is deprecated.

Moves the cursor to the next object and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetNextObjData(
 out Euresys.Open_eVision.EObjectData object_
 )
```

Parameters

*object_*

Pointer to an EObjectData to receive the data.

ECodedImage.GetNextObjPtr

This method is deprecated.

Returns a pointer to the next objects list item, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetNextObjPtr(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

listItem

Pointer to the current objects list item.

ECodedImage.GetNextRunData

This method is deprecated.

Moves the cursor to the next run and returns the associated data.

Namespace: Euresys.Open_eVision

[C#]

```
void GetNextRunData(
 out Euresys.Open_eVision.ERunData run
 )

void GetNextRunData(
 out Euresys.Open_eVision.ERunData run,
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

run

Pointer to an ERunData to receive the data.

listItem

Pointer to the current run list item.

ECodedImage.GetNextRunPtr

This method is deprecated.

Returns a pointer to the next run list item, or NULL.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem GetNextRunPtr(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

listItem

Pointer to the current run list item.

ECodedImage.GetNumHoles

This method is deprecated.

Returns the number of holes related to the specified object.

Namespace: Euresys.Open_eVision

```
[C#]
int GetNumHoles(
 Euresys.Open_eVision.EListItem object_
 )
```

Parameters

*object_*

Pointer to the object list item whose holes have to be counted.

Remarks

By default, the parameter object is set to NULL, meaning that the function returns the total number of holes added to the objects list. After a call to the ECodedImage::BuildHoles function, the ECodedImage::NumObjects and ECodedImage::NumSelectedObjects properties contain the total number of objects (i.e. real objects + holes).

ECodedImage.GetNumObjectRuns

This method is deprecated.

Returns the number of runs comprised in a given object.

Namespace: Euresys.Open_eVision

```
[C#]
int GetNumObjectRuns(
 int objectNumber
 )
int GetNumObjectRuns(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

objectNumber

Object identification number.

listItem

Pointer to an objects list item.

ECodedImage.GetObjDataPtr

This method is deprecated.

Gets the EObjectData associated to a given objects list item.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetObjDataPtr(
 Euresys.Open_eVision.EListItem currentFeature,
 out Euresys.Open_eVision.EObjectData objectData
 )
```

Parameters

currentFeature

Pointer to the current objects list item.

objectData

Pointer to a EObjectData to receive the data.

ECodedImage.GetObjectData

This method is deprecated.

If an object identification number is given, moves the cursor to the object with a given identification number and returns the associated data. If a list item is given, returns the object data associated with an object list item (cf. EListItem). See also ECodedImage::GetCurrentObjData.

Namespace: Euresys.Open_eVision

[C#]

```
void GetObjectData(
 out Euresys.Open_eVision.EObjectData object_,
 int objectNumber
 )

void GetObjectData(
 out Euresys.Open_eVision.EObjectData object_,
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

*object_*

Pointer to an EObjectData structure to receive the object data.

objectNumber

Object identification number.

listItem

Pointer to the current object list item (cf. EListItem).

ECodedImage.GetObjectFeature

This method is deprecated.

Allows retrieving the value of a feature of a given object.

Namespace: Euresys.Open_eVision

[C#]

```
void GetObjectFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem objectNumber,
 out sbyte result
 )

void GetObjectFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 out short result
 )

void GetObjectFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 out int result
 )

void GetObjectFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 out float result
 )

void GetObjectFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.EListItem object_,
 out double result
 )

void GetObjectFeature(
 int feature,
 int objectNumber,
 out sbyte result
 )

void GetObjectFeature(
 int feature,
 int objectNumber,
 out short result
 )

void GetObjectFeature(
 int feature,
 int objectNumber,
 out int result
 )

void GetObjectFeature(
 int feature,
 int objectNumber,
 out float result
 )
```

```
void GetObjectFeature(
 int feature,
 int objectNumber,
 out double result
 )

void GetObjectFeature(
 Euresys.Open_eVision.EListItem feature,
 int objectNumber,
 out sbyte result
 )

void GetObjectFeature(
 Euresys.Open_eVision.EListItem feature,
 int objectNumber,
 out short result
 )

void GetObjectFeature(
 Euresys.Open_eVision.EListItem feature,
 int objectNumber,
 out int result
 )

void GetObjectFeature(
 Euresys.Open_eVision.EListItem feature,
 int objectNumber,
 out float result
 )

void GetObjectFeature(
 Euresys.Open_eVision.EListItem feature,
 int objectNumber,
 out double result
 )
```

Parameters

feature
Pointer to the feature list item.

objectNumber
Object number.

result
Reference to the feature value.

*object_*
Pointer to the list item (from the objects list) corresponding to the object.

ECodedImage.GetObjFirstRunPtr

This method is deprecated.

Returns a pointer to the first run list item of an object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem GetObjFirstRunPtr(
 int objectNumber
 )
Euresys.Open_eVision.EListItem GetObjFirstRunPtr(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

objectNumber

Object identification number.

listItem

Pointer to the objects list item.

ECodedImage.GetObjLastRunPtr

This method is deprecated.

Returns a pointer to the last run list item of an object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem GetObjLastRunPtr(
 int objectNumber
 )
Euresys.Open_eVision.EListItem GetObjLastRunPtr(
 Euresys.Open_eVision.EListItem objectNumber
 )
```

Parameters

objectNumber

Object identification number.

ECodedImage.GetObjPtr

This method is deprecated.

Returns a pointer to the given objects list item.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem GetObjPtr(
 int objectNumber
 )
```

Parameters

objectNumber

Object identification number.

ECodedImage.GetObjPtrByCoordinates

This method is deprecated.

Returns a pointer to the objects list item that contains the point of given coordinates, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetObjPtrByCoordinates(
 int x,
 int y
 )
```

Parameters

x

Point abscissa.

y

Point ordinate.

Remarks

This function is useful for object selection with a mouse.

ECodedImage.GetObjPtrByPos

This method is deprecated.

Returns a pointer to the objects list item of given absolute position, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetObjPtrByPos(
 int position
 )
```

Parameters

position

Absolute position in the objects list, counting from 0 on.

ECodedImage.GetPreviousObjData

This method is deprecated.

Moves the cursor to the previous object and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetPreviousObjData(
 out Euresys.Open_eVision.EObjectData object_
 )
```

Parameters

*object_*

Pointer to an EObjectData to receive the data.

ECodedImage.GetPreviousObjPtr

This method is deprecated.

Returns a pointer to the previous objects list item, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetPreviousObjPtr(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

listItem

Pointer to the current objects list item.

ECodedImage.GetPreviousRunData

This method is deprecated.

Moves the cursor to the previous run and returns the associated data.

Namespace: Euresys.Open_eVision

```
[C#]
void GetPreviousRunData(
 out Euresys.Open_eVision.ERunData run,
 Euresys.Open_eVision.EListItem listItem
 )
void GetPreviousRunData(
 out Euresys.Open_eVision.ERunData run
 )
```

Parameters

run

Pointer to an ERunData to receive the data.

listItem

Pointer to the current run list item.

ECodedImage.GetPreviousRunPtr

This method is deprecated.

Returns a pointer to the previous run list item, or NULL.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem GetPreviousRunPtr(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

listItem

Pointer to the current run list item.

ECodedImage.GetRunData

This method is deprecated.

Returns the run data associated to the specified run.

Namespace: Euresys.Open_eVision

[C#]

```
void GetRunData(
 out Euresys.Open_eVision.ERunData run,
 int position
 )

void GetRunData(
 out Euresys.Open_eVision.ERunData run,
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

run

Pointer to an ERunData to receive the data.

position

Absolute position in the run list, counting from 0 on.

listItem
Pointer to the current run list item.

ECodedImage.GetRunDataPtr

This method is deprecated.

Gets the ERunData associated to a given run list item.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetRunDataPtr(
 Euresys.Open_eVision.EListItem currentFeature,
 out Euresys.Open_eVision.ERunData runData
 )
```

Parameters

currentFeature
Pointer to the current run list item.

runData
Pointer to a ERunData to receive the data.

ECodedImage.GetRunPtr

This method is deprecated.

Returns a pointer to the run list item of given absolute position, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetRunPtr(
 int position
 )
```

Parameters

position
Absolute position in the run list, counting from 0 on.

ECodedImage.GetRunPtrByCoordinates

This method is deprecated.

Returns a pointer to the run list item that contains the point of given coordinates, or NULL.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EListItem GetRunPtrByCoordinates(
 int x,
 int y
 )
```

Parameters

x

Point abscissa.

y

Point ordinate.

Remarks

This function is useful for run selection with a mouse.

ECodedImage.HighColorThreshold

This property is deprecated.

Upper threshold (color) used for image segmentation.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24 HighColorThreshold
  { get; set; }
```

Remarks

The threshold value is constant over the whole image.

ECodedImage.HighImage

This property is deprecated.

Image used as an adaptive upper threshold.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW8 HighImage
  { get; set; }
```

Remarks

The threshold is adaptive (specified pixel by pixel).

ECodedImage.HighThreshold

This property is deprecated.

Upper threshold (gray level) used for image segmentation.

Namespace: Euresys.Open_eVision

```
[C#]
uint HighThreshold
  { get; set; }
```

Remarks

The threshold value is constant over the whole image.

ECodedImage.IsHole

This method is deprecated.

Returns true if the specified object is a hole, false otherwise.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsHole(
 Euresys.Open_eVision.EListItem object_
 )
```

Parameters

*object_*

Pointer to the objects list item.

ECodedImage.IsObjectSelected

This method is deprecated.

Sets bSelected to true if an object is selected.

Namespace: Euresys.Open_eVision

```
[C#]
void IsObjectSelected(
 int objectNumber,
 out bool selected
 )
```

```
void IsObjectSelected(
 Euresys.Open_eVision.EListItem listItem,
 out bool selected
 )
```

Parameters

objectNumber
Object identification number.

selected
Reference to the result.

listItem
Pointer to the objects list item.

Remarks

ECodedImage.LastObjPtr

This property is deprecated.

Pointer to the last objects list item, or NULL.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EListItem LastObjPtr
  { get; }
```

ECodedImage.LimitAngle

This property is deprecated.

Angle of the skewed bounding box feature, in the current angle unit.

Namespace: Euresys.Open_eVision

[C#]

```
float LimitAngle
  { get; set; }
```

ECodedImage.LowColorThreshold

This property is deprecated.

Lower threshold (color) used for image segmentation.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EC24 LowColorThreshold
  { get; set; }
```

Remarks

The threshold value is constant over the whole image.

ECodedImage.LowImage

This property is deprecated.

Image used as an adaptive lower threshold.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW8 LowImage
  { get; set; }
```

Remarks

The threshold value is adaptive (specified pixel by pixel).

ECodedImage.LowThreshold

This property is deprecated.

Lower threshold (gray level) used for image segmentation.

Namespace: Euresys.Open_eVision

[C#]

```
uint LowThreshold
  { get; set; }
```

Remarks

The threshold value is constant over the whole image.

ECodedImage.MaxObjects

This property is deprecated.

Maximum number of objects to look for.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxObjects
  { get; set; }
```

Remarks

After having found that amount of object, the process will stop and return an error message. If not set, no maximum value is defined.

ECodedImage.NeutralClass

This property is deprecated.

Neutral class index (between both thresholds).

Namespace: Euresys.Open_eVision

[C#]

```
short NeutralClass
  { get; set; }
```

Remarks

Non zero when the neutral runs (between both thresholds) are coded. 0 means "do not code this class". <!-- 2 by default. -->

ECodedImage.NumFeatures

This property is deprecated.

Number of features currently in use.

Namespace: Euresys.Open_eVision

[C#]

```
int NumFeatures
  { get; }
```

ECodedImage.NumHoleRuns

This property is deprecated.

Total number of hole runs in the list of object runs.

Namespace: Euresys.Open_eVision

[C#]

```
int NumHoleRuns
```

```
{ get; }
```

Remarks

After a call to ECodedImage::BuildHoles, ECodedImage::NumRuns contains the total number of runs (real object runs + hole runs).

ECodedImage.NumObjects

This property is deprecated.

Number of objects in the coded image.

Namespace: Euresys.Open_eVision

```
[C#]
int NumObjects
  { get; }
```

Remarks

After a call to ECodedImage::BuildHoles, ECodedImage::NumObjects returns the total number of objects (real objects + holes).

ECodedImage.NumRuns

This property is deprecated.

Total number of runs in the list of object runs.

Namespace: Euresys.Open_eVision

```
[C#]
int NumRuns
  { get; }
```

Remarks

After a call to ECodedImage::BuildHoles, ECodedImage::NumRuns returns the total number of runs (real object runs + hole runs).

ECodedImage.NumSelectedObjects

This property is deprecated.

Number of objects currently selected.

Namespace: Euresys.Open_eVision

[C#]

```
int NumSelectedObjects
  { get; set; }
```

Remarks

After a call to ECodedImage::BuildHoles, ECodedImage::NumSelectedObjects returns the total number of objects (real objects + holes).

ECodedImage.ObjectConvexHull

This method is deprecated.

Computes the convex hull of an object and stores it in a EPathVector.

Namespace: Euresys.Open_eVision

[C#]

```
void ObjectConvexHull(
 Euresys.Open_eVision.EListItem object_,
 Euresys.Open_eVision.EPathVector destinationVector
 )
```

Parameters

*object_*

Pointer to the objects list item.

destinationVector

Vector containing the vertices coordinates of the convex hull.

ECodedImage.RemoveAllFeats

This method is deprecated.

Deletes all features from the features list.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveAllFeats(
 )
```

ECodedImage.RemoveAllObjects

This method is deprecated.

Deletes all objects from the objects list.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveAllObjects(
 )
```

ECodedImage.RemoveAllRuns

This method is deprecated.

Deletes all runs from the runs list.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveAllRuns(
 )
```

ECodedImage.RemoveHoles

This method is deprecated.

Permanently erases, from the objects list, holes related to the specified object.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveHoles(
 Euresys.Open_eVision.EListItem object_
 )
```

Parameters

*object_*

Pointer to the objects list item, for which the holes have to be erased.

Remarks

If the parameter is NULL, all the holes are deleted. By default, the parameter is set to NULL, meaning that all the holes have to be erased from the objects list.

ECodedImage.RemoveObject

This method is deprecated.

Deletes an object from the objects list.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveObject(
 int objectNumber
 )
void RemoveObject(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

objectNumber

Object identification number.

listItem

Pointer to the current objects list item.

ECodedImage.RemoveRun

This method is deprecated.

Deletes a run from the runs list.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveRun(
 int position
 )
void RemoveRun(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

position

Absolute position in the run list, counting from 0 on.

listItem

Pointer to the current run list item.

ECodedImage.ResetContinuousMode

This method is deprecated.

When the continuous mode is activated, this method resets the sequence of images.

Namespace: Euresys.Open_eVision

[C#]

```
void ResetContinuousMode(
 )
```

Remarks

Thus, the next call for an object building will not take into account any previous image. If the continuous mode is disabled, this method does nothing.

ECodedImage.SelectAllObjects

This method is deprecated.

Selects all objects.

Namespace: Euresys.Open_eVision

```
[C#]
void SelectAllObjects(
 )
```

ECodedImage.SelectHoles

This method is deprecated.

Selects the holes related to the specified object.

Namespace: Euresys.Open_eVision

```
[C#]
void SelectHoles(
 Euresys.Open_eVision.EListItem parentObject
 )
```

Parameters

parentObject

Pointer to the objects list item, for which the holes have to be selected.

Remarks

If the parameter is NULL, all the holes are selected. By default, the parameter is set to NULL, meaning that all the holes have to be selected. If parentObject is a hole (instead of a real object) or has no hole, no selection is performed.

ECodedImage.SelectObject

This method is deprecated.

Selects an object.

Namespace: Euresys.Open_eVision

[C#]

```
void SelectObject(
 int objectNumber
 )

void SelectObject(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

objectNumber

Object identification number.

listItem

Pointer to the objects list item.

ECodedImage.SelectObjectsUsingFeature

This method is deprecated.

Selects or deselects objects, according to the value of a specified feature.

Namespace: Euresys.Open_eVision

[C#]

```
void SelectObjectsUsingFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 sbyte minimum,
 sbyte maximum,
 Euresys.Open_eVision.ESelectOption operation
 )

void SelectObjectsUsingFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 short minimum,
 short maximum,
 Euresys.Open_eVision.ESelectOption operation
 )

void SelectObjectsUsingFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 int minimum,
 int maximum,
 Euresys.Open_eVision.ESelectOption operation
 )

void SelectObjectsUsingFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 float minimum,
 float maximum,
 Euresys.Open_eVision.ESelectOption operation
 )
```

```
void SelectObjectsUsingFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 double minimum,
 double maximum,
 Euresys.Open_eVision.ESelectOption operation
 )
```

Parameters

feature
Feature code, as defined by EFeature.

minimum
Selection interval lower bound.

maximum
Selection interval upper bound.

operation
Selection mode, as defined by ESelectOption.

ECodedImage.SelectObjectsUsingPosition

This method is deprecated.

Selects or deselects objects, using a delimiting rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void SelectObjectsUsingPosition(
 Euresys.Open_eVision.EBaseROI roi,
 Euresys.Open_eVision.ESelectByPosition operation
 )

void SelectObjectsUsingPosition(
 int originX,
 int originY,
 int width,
 int height,
 Euresys.Open_eVision.ESelectByPosition operation
 )
```

Parameters

roi
Pointer to an image/ROI whose position parameters will define the selection rectangle.

operation
Selection mode, as defined by ESelectByPosition.

originX
Abscissa of the upper left corner of the rectangle.

originY
Ordinate of the upper left corner of the rectangle.

width
Rectangle width, in pixels.
height
Rectangle height, in pixels.

Remarks

The rectangle coordinates are always specified with respect to the whole image.

ECodedImage.SetFeatInfo

This method is deprecated.

Sets the appropriate data size and type for a predefined feature.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFeatInfo(
 ref Euresys.Open_eVision.EFeatureData feature,
 Euresys.Open_eVision.ELegacyFeature featureCode
 )
```

Parameters

feature
Feature code, as defined by ELegacyFeature.
featureCode
Pointer to a EFeatureData structure describing the feature.

ECodedImage.SetFirstRunPtr

This method is deprecated.

Sets the first run list item of an object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFirstRunPtr(
 Euresys.Open_eVision.EListItem firstRun,
 int objectNumber
 )
void SetFirstRunPtr(
 Euresys.Open_eVision.EListItem firstRun,
 Euresys.Open_eVision.EListItem currentObject
 )
```

Parameters

firstRun
Pointer to the first run of the object.

objectNumber
Object identification number.
currentObject
Pointer to the objects list item.

ECodedImage.SetLastRunPtr

This method is deprecated.

Sets the last run list item of an object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetLastRunPtr(
 Euresys.Open_eVision.EListItem lastRun,
 int objectNumber
 )
void SetLastRunPtr(
 Euresys.Open_eVision.EListItem lastRun,
 Euresys.Open_eVision.EListItem currentObject
 )
```

Parameters

lastRun
Pointer to the last run of the object.
objectNumber
Object identification number.
currentObject
Pointer to the objects list item.

ECodedImage.SortObjectsUsingFeature

This method is deprecated.

Sorts objects according to the value of some feature.

Namespace: Euresys.Open_eVision

```
[C#]
void SortObjectsUsingFeature(
 Euresys.Open_eVision.ELegacyFeature feature,
 Euresys.Open_eVision.ESortOption Operation
 )
```

Parameters

feature
Feature code, as defined by ELegacyFeature.

Operation

Selection mode, as defined by ESortOption.

ECodedImage.Threshold

This property is deprecated.

Threshold mode (gray level) used for image segmentation.

Namespace: Euresys.Open_eVision

[C#]

```
uint Threshold
  { get; set; }
```

Remarks

By default, the "minimum residue" mode is used to determine the threshold. The threshold is constant over the whole image. When using a single threshold instead of a low threshold and a high threshold, the neutral class is ignored. Only the black and white classes are relevant.

ECodedImage.ThresholdImage

This property is deprecated.

Single threshold used for image segmentation.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW8 ThresholdImage
  { get; set; }
```

Remarks

The threshold value is adaptive (specified pixel by pixel). When using a single threshold instead of a low threshold and a high threshold, the neutral class is ignored. Only the black and white classes are relevant.

ECodedImage.TrueThreshold

This property is deprecated.

Absolute threshold level, when using a single threshold.

Namespace: Euresys.Open_eVision

[C#]

```
uint TrueThreshold
  { get; }
```

ECodedImage.UnselectAllObjects

This method is deprecated.

Deselects all objects.

Namespace: Euresys.Open_eVision

```
[C#]
void UnselectAllObjects(
 )
```

ECodedImage.UnselectHoles

This method is deprecated.

Unselects the holes related to the specified object.

Namespace: Euresys.Open_eVision

```
[C#]
void UnselectHoles(
 Euresys.Open_eVision.EListItem parentObject
 )
```

Parameters

parentObject

Pointer to the objects list item, for which the holes have to be unselected.

Remarks

If the parameter is NULL, all the holes are unselected. By default, the parameter is set to NULL, meaning that all the holes have to be unselected. If parentObject is a hole (instead of a real object) or if parentObject has no hole, nothing is changed.

ECodedImage.UnselectObject

This method is deprecated.

Deselects an object.

Namespace: Euresys.Open_eVision

```
[C#]
void UnselectObject(
 int objectNumber
 )
```

```
void UnselectObject(
 Euresys.Open_eVision.EListItem listItem
 )
```

Parameters

objectNumber

Object identification number.

listItem

Pointer to the objects list item.

Remarks

Once an object has been unselected, it doesn't allow browsing a list of selected objects anymore (using ECodedImage::GetPreviousObjPtr or ECodedImage::GetNextObjPtr).

ECodedImage.WhiteClass

This property is deprecated.

White class index (above the upper threshold).

Namespace: Euresys.Open_eVision

```
[C#]
short WhiteClass
  { get; set; }
```

Remarks

Non zero when the white runs (above the upper threshold) are coded. 0 means "do not code this class". <!-- 3 by default. -->

4.62. ECodedImage2 Class

The main class of the EasyObject API that represents a coded image, as produced by the encoder.

Remarks

It provides methods to get features of the encoded image, to access an object in a particular layer of the encoded image, to draw objects or objects features in a particular layer of the encoded image, to render a mask, etc...

Namespace: Euresys.Open_eVision

Properties

Height	Returns the height of the coded image.
LayerCount	Returns the number of layers that are encoded.

StartY	Returns the lowest row index, for all the runs of all the objects in the coded image.
Width	Returns the width of the coded image.

Methods

ClearFeatureCache	Clears the internal cache for the computed features.
Draw	Draw the designated coded element, all the objects from a layer, or all the coded elements from a given selection.
DrawFeature	Draw a given feature of the designated coded element, of all the objects from a layer, or of all the coded elements from a given selection.
DrawFeatureWithCurrentPen	Draw a given feature of the designated coded element, of all the objects from a layer, or of all the coded elements from a given selection.
DrawHole	Draw the designated hole.
DrawHoleFeature	Draw a given feature of the designated hole.
DrawHoleFeatureWithCurrentPen	Draw a given feature of the designated hole.
DrawHoleWithCurrentPen	Draw the designated hole.
DrawObject	Draw the designated object.
DrawObjectFeature	Draw a given feature of the designated object.
DrawObjectFeatureWithCurrentPen	Draw a given feature of the designated object.
DrawObjectWithCurrentPen	Draw the designated object.
DrawWithCurrentPen	Draw the designated coded element, all the objects from a layer, or all the coded elements from a given selection.
ECodedImage2	Constructs a coded image.
FindObject	Finds an object in the coded image using its coordinates.
GetObj	Random access to an object in a given layer.
GetObjCount	Returns the number of objects in a given layer.
GetParentObject	Returns a reference to the object that contains a given hole.
RenderMask	Creates a Flexible Mask from a specified layer of the encoded image.
ToRegion	Converts the encoded image to an ERegion.

ECodedImage2.ClearFeatureCache

Clears the internal cache for the computed features.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearFeatureCache(
 )
```

Remarks

This is useful to reduce memory consumption.

ECodedImage2.Draw

Draw the designated coded element, all the objects from a layer, or all the coded elements from a given selection.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

element

The coded element to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

layerIndex

Index of the layer of interest. If no layer index is specified, the default layer is taken into consideration. Note that this methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

selection

The selection of coded elements to draw.

elementIndex

The index in the selection of the coded element to draw. If no element index is specified, all the elements of the selection are take into consideration.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawFeature

Draw a given feature of the designated coded element, of all the objects from a layer, or of all the coded elements from a given selection.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

feature

The feature of interest.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the ellipses and of the rectangles are to be drawn.

layerIndex

Index of the layer of interest. If no layer index is specified, the default layer is taken into consideration. Note that this methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

element

The coded element to draw.

selection

The selection of coded elements to draw.

elementIndex

The index in the selection of the coded element to draw. If no element index is specified, all the elements of the selection are take into consideration.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

The features FeretBox and WeightedGravityCenter are only at one's disposal when drawing selections.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawFeatureWithCurrentPen

This method is deprecated.

Draw a given feature of the designated coded element, of all the objects from a layer, or of all the coded elements from a given selection.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

feature

The feature of interest.

layerIndex

Index of the layer of interest. If no layer index is specified, the default layer is taken into consideration. Note that this methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the ellipses and of the rectangles are to be drawn.

element

The coded element to draw.

selection

The selection of coded elements to draw.

elementIndex

The index in the selection of the coded element to draw. If no element index is specified, all the elements of the selection are take into consideration.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

The features FeretBox and WeightedGravityCenter are only at one's disposal when drawing selections.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawHole

Draw the designated hole.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawHole(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawHole(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawHole(
 IntPtr graphicContext,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHole(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHole(
 IntPtr graphicContext,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHole(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

objectIndex

Index of the parent object of the hole to draw.

holeIndex

Index of the hole to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image <contains several layers. Indeed, in such a case, no default layer exists.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawHoleFeature

Draw a given feature of the designated hole.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawHoleFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawHoleFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawHoleFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawHoleFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawHoleFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawHoleFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

feature

The feature of interest.

objectIndex

Index of the parent object of the hole to draw.

holeIndex

Index of the hole to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the ellipses and of the rectangles are to be drawn.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the <default layer will be taken into consideration.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

Trying to draw the features FeretBox and WeightedGravityCenter will <result in an exception, as they only make sense for EObjectSelection.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawHoleFeatureWithCurrentPen

This method is deprecated.

Draw a given feature of the designated hole.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawHoleFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawHoleFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

feature

The feature of interest.

objectIndex

Index of the parent object of the hole to draw.

holeIndex

Index of the hole to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the ellipses and of the rectangles are to be drawn.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the <default layer will be taken into consideration.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

Trying to draw the features FeretBox and WeightedGravityCenter will <result in an exception, as they only make sense for EObjectSelection.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawHoleWithCurrentPen

This method is deprecated.

Draw the designated hole.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawHoleWithCurrentPen(
 IntPtr graphicContext,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawHoleWithCurrentPen(
 IntPtr graphicContext,
 uint objectIndex,
 uint holeIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

objectIndex

Index of the parent object of the hole to draw.

holeIndex

Index of the hole to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image <contains several layers. Indeed, in such a case, no default layer exists.
 Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawObject

Draw the designated object.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObject(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 IntPtr graphicContext,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawObject(
 IntPtr graphicContext,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawObject(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

objectIndex

Index of the object to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image <contains several layers. Indeed, in such a case, no default layer exists.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawObjectFeature

Draw a given feature of the designated object.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawObjectFeature(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void DrawObjectFeature(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

feature

The feature of interest.

objectIndex

Index of the object to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the ellipses and of the rectangles are to be drawn.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

Trying to draw the features FeretBox and WeightedGravityCenter will result in an exception, as they only make sense for EObjectSelection.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawObjectFeatureWithCurrentPen

This method is deprecated.

Draw a given feature of the designated object.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )

void DrawObjectFeatureWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawableFeature feature,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

feature

The feature of interest.

objectIndex

Index of the object to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the ellipses and of the rectangles are to be drawn.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

Trying to draw the features FeretBox and WeightedGravityCenter will result in an exception, as they only make sense for EObjectSelection.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawObjectWithCurrentPen

This method is deprecated.

Draw the designated object.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjectWithCurrentPen(
 IntPtr graphicContext,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawObjectWithCurrentPen(
 IntPtr graphicContext,
 uint layerIndex,
 uint objectIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

objectIndex

Index of the object to draw.

zoomX

Horizontal zooming factor. By default, no scaling is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image <contains several layers. Indeed, in such a case, no default layer exists.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.DrawWithCurrentPen

This method is deprecated.

Draw the designated coded element, all the objects from a layer, or all the coded elements from a given selection.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.ECodedElement element,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawWithCurrentPen(
 IntPtr graphicContext,
 uint layerIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EObjectSelection selection,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EObjectSelection selection,
 uint elementIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

element

The coded element to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

layerIndex

Index of the layer of interest. If no layer index is specified, the default layer is taken into consideration. Note that this methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

selection

The selection of coded elements to draw.

elementIndex

The index in the selection of the coded element to draw. If no element index is specified, all the elements of the selection are take into consideration.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ECodedImage2.ECodedImage2

Constructs a coded image.

Namespace: Euresys.Open_eVision

```
[C#]
void ECodedImage2(
 )
```

ECodedImage2.FindObject

Finds an object in the coded image using its coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EObject FindObject(
 int x,
 int y
 )
```

```
Euresys.Open_eVision.EObject FindObject(
 uint layerIndex,
 int x,
 int y
 )
```

Parameters

x

The X-coordinate of the object.

y

The Y-coordinate of the object.

layerIndex

The index of the layer of interest.

Remarks

If no layer index is specified, all the layers of the coded image are scanned until an object is found at these coordinates.

ECodedImage2.GetObj

Random access to an object in a given layer.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObject GetObj(
 uint layerIndex,
 uint objectIndex
 )

Euresys.Open_eVision.EObject GetObj(
 uint layerIndex,
 uint objectIndex
 )

Euresys.Open_eVision.EObject GetObj(
 uint objectIndex
 )

Euresys.Open_eVision.EObject GetObj(
 uint objectIndex
 )
```

Parameters

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

objectIndex

The index of the object in the layer.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

ECodedImage2.GetObjCount

Returns the number of objects in a given layer.

Namespace: Euresys.Open_eVision

[C#]

```
uint GetObjCount(
 uint layerIndex
 )

uint GetObjCount(
 )
```

Parameters

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

ECodedImage2.GetParentObject

Returns a reference to the object that contains a given hole.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObject GetParentObject(
 Euresys.Open_eVision.EHole hole
 )

Euresys.Open_eVision.EObject GetParentObject(
 Euresys.Open_eVision.EHole hole
 )
```

Parameters

hole

The hole of interest.

ECodedImage2.Height

Returns the height of the coded image.

Namespace: Euresys.Open_eVision

[C#]

```
uint Height
  { get; }
```

Remarks

If the continuous mode is not activated, this height corresponds to the height of the source image. If the continuous mode is activated, this value equals to the highest row index, for all the runs of all the objects in the coded image, augmented by the number of rows index that are below zero.

ECodedImage2.LayerCount

Returns the number of layers that are encoded.

Namespace: Euresys.Open_eVision

[C#]

```
uint LayerCount
  { get; }
```

ECodedImage2.RenderMask

Creates a Flexible Mask from a specified layer of the encoded image.

Namespace: Euresys.Open_eVision

[C#]

```
void RenderMask(
 Euresys.Open_eVision.EROIBW8 result
 )
```

```
void RenderMask(
 Euresys.Open_eVision.EROIBW8 result,
 uint layerIndex,
 int offsetX,
 int offsetY
 )
void RenderMask(
 Euresys.Open_eVision.EROIBW8 result,
 uint layerIndex
 )
void RenderMask(
 Euresys.Open_eVision.EROIBW8 result,
 int offsetX,
 int offsetY
 )
```

Parameters

result

The image in which the generated mask will be stored.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will serve as a source for the mask generation.

offsetX

The X-offset that must be applied to bring the zero X-coordinate in the coded image on the first column of the result image (defaults to zero).

offsetY

The Y-offset that must be applied to bring the zero Y-coordinate in the coded image on the first row of the result image (defaults to zero).

Remarks

The size of the result image will not be changed: It must be properly sized beforehand.

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

ECodedImage2.StartY

Returns the lowest row index, for all the runs of all the objects in the coded image.

Namespace: Euresys.Open_eVision

```
[C#]
int StartY
  { get; }
```

Remarks

The returned value will always be zero if the continuous mode is not activated.

ECodedImage2.ToRegion

Converts the encoded image to an ERegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion ToRegion(
 )
```

ECodedImage2.Width

Returns the width of the coded image.

Namespace: Euresys.Open_eVision

```
[C#]
uint Width
  { get; }
```

Remarks

This width corresponds in any case to the width of the source image.

4.63. ECodeGrid Class

Represents a grid of Codes

Namespace: Euresys.Open_eVision

Properties

EnableAll	Enable/Disable all cells
NumCols	Returns the number of columns in the grid
NumRows	Returns the number of rows in the grid

Methods

ECodeGrid	Creates an ECodeGrid object.
GetCellEnabled	Returns true if Cell is enabled and false otherwise
GetResults	Returns the detected codes
operator=	Assignment operator
SetEnableCell	Enable/Disable Cell

SetEnableColumn	Enable/Disable Column
SetEnableRow	Enable/Disable Row

ECodeGrid.ECodeGrid

Creates an ECodeGrid object.

Namespace: Euresys.Open_eVision

```
[C#]
void ECodeGrid(
 )
void ECodeGrid(
 Euresys.Open_eVision.ECodeGrid other
 )
void ECodeGrid(
 uint numCols,
 uint numRows
 )
```

Parameters

other

The reference ECodeGrid instance to copy this one from.

numCols

The number of columns in the grid.

numRows

The number of rows in the grid.

ECodeGrid.EnableAll

Enable/Disable all cells

Namespace: Euresys.Open_eVision

```
[C#]
bool EnableAll
  { get; set; }
```

Remarks

By default, all grid cells are enabled.

ECodeGrid.GetCellEnabled

Returns true if Cell is enabled and false otherwise

Namespace: Euresys.Open_eVision

```
[C#]
bool GetCellEnabled(
 uint column,
 uint row
 )
```

Parameters

column

-

row

-

Remarks

By default, all grid cells are enabled.

ECodeGrid.GetResults

Returns the detected codes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECode[] GetResults(
 uint column,
 uint row
 )
Euresys.Open_eVision.ECode[] GetResults(
 )
```

Parameters

column

The column of a cell.

row

The row of a cell.

ECodeGrid.NumCols

Returns the number of columns in the grid

Namespace: Euresys.Open_eVision

```
[C#]
uint NumCols
  { get; }
```

ECodeGrid.NumRows

Returns the number of rows in the grid

Namespace: Euresys.Open_eVision

```
[C#]
uint NumRows
  { get; }
```

ECodeGrid.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECodeGrid operator=(
 Euresys.Open_eVision.ECodeGrid other
 )
```

Parameters

other

The ECodeGrid instance to assign.

ECodeGrid.SetEnableCell

Enable/Disable Cell

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableCell(
 uint column,
 uint row,
 bool enable
 )
```

Parameters

column

-

row

-

enable

-

Remarks

By default, all grid cells are enabled.

ECodeGrid.SetEnableColumn

Enable/Disable Column

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableColumn(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

ECodeGrid.SetEnableRow

Enable/Disable Row

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableRow(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

4.64. ECodeReader Class

An ECodeReader instance can detect and decode various types of codes.

Namespace: Euresys.Open_eVision

Properties

BarCodeReader	Gets the underlying EBarCodeReader instance
EnabledCodeTypes	The enabled code types
MatrixCodeReader	Gets the underlying EMatrixCodeReader instance
MaxNumCodesPerType	The maximum number of codes that the reader should try to find.
QRCodeReader	Gets the underlying EQRCodeReader instance
TimeOut	The timeout for the ECodeReader::Read method in microseconds.

Methods

ECodeReader	Creates an ECodeReader object.
Load	Load the configuration for this ECodeReader instance.
operator=	Assignment operator
Read	Tries to locate, decode and read data codes in the given ROI
Save	Save the configuration for this ECodeReader instance.

ECodeReader.BarCodeReader

Gets the underlying EBarCodeReader instance

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EasyBarCode2.EBarCodeReader BarCodeReader
  { get; }
```

ECodeReader.ECodeReader

Creates an ECodeReader object.

Namespace: Euresys.Open_eVision

```
[C#]
void ECodeReader(
 )
void ECodeReader(
 Euresys.Open_eVision.ECodeReader other
 )
```

Parameters

other

Another ECodeReader object to be copied in the new ECodeReader object.

ECodeReader.EnabledCodeTypes

The enabled code types

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ECodeType[] EnabledCodeTypes
  { get; set; }
```

Remarks

All code types enabled by default

ECodeReader.Load

Load the configuration for this ECodeReader instance.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path from which to load the configuration.

serializer

The serializer.

ECodeReader.MatrixCodeReader

Gets the underlying EMatrixCodeReader instance

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeReader MatrixCodeReader
  { get; }
```

ECodeReader.MaxNumCodesPerType

The maximum number of codes that the reader should try to find.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxNumCodesPerType
  { get; set; }
```

Remarks

By default, this parameter is set to 1.

ECodeReader.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECodeReader operator=(
 Euresys.Open_eVision.ECodeReader other
 )
```

Parameters

other

ECodeReader object to be copied.

ECodeReader.QRCodeReader

Gets the underlying EQRCodeReader instance

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeReader QRCodeReader
  { get; }
```

ECodeReader.Read

Tries to locate, decode and read data codes in the given ROI

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECode[] Read(
 Euresys.Open_eVision.EROIBW8 field
 )

Euresys.Open_eVision.ECode[] Read(
 Euresys.Open_eVision.EROIBW8 field,
 Euresys.Open_eVision.ERegion region
 )

Euresys.Open_eVision.ECodeGrid Read(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ERectangleRegion area,
 int numCellsX,
 int numCellsY,
 float extension
 )

Euresys.Open_eVision.ECodeGrid Read(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ERectangleRegion area,
 Euresys.Open_eVision.ECodeGrid grid,
 float extension
 )
```

Parameters

field

-

region

Region into the search field where the data matrix codes have to be found.

roi

The ROI in which the data matrix codes have to be found.

area

Rectangular Region used as the full grid area

numCellsX

Number of grid cells in the X direction

numCellsY

Number of grid cells in the Y direction

extension

Extension of the grid cells to allow cell overlap. For instance, 0.0f means no extension and 0.1f means a 10% cell size extension.

grid

Grid with cell disabling capabilities

Remarks

The grid overload allows you to disable some cells of the grid if those cells are not supposed to contain codes. See the ECodeGrid class documentation for more information.

ECodeReader.Save

Save the configuration for this ECodeReader instance.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path to which to save the configuration.

serializer

The serializer.

ECodeReader.TimeOut

The timeout for the ECodeReader::Read method in microseconds.

Namespace: Euresys.Open_eVision

```
[C#]
System.UInt64 TimeOut
  { get; set; }
```

Remarks

If the processing time of one of these methods becomes longer than the set time-out period, the process is stopped.
The ECodeReader::Read method will return all the codes it has decoded up to that point.
Note that the time-out period is not exact: the process is stopped at the first checkpoint after the time-out period has elapsed.

4.65. EColorLookup Class

Describes a color lookup table, that is used to speed-up complex conversions between color systems.

Namespace: Euresys.Open_eVision

Properties

ColorSystemIn	Input color system.
ColorSystemOut	Output color system.
IndexBits	Number of bits used for indexing the lookup table.
Interpolation	Interpolation mode.

Methods

AdjustGainOffset	Sets a color transformation such that a gain and offset is applied separately to each color component of a target color system.
Calibrate	Sets a color transformation to recalibrate.
ConvertFromRgb	Sets a color transformation from the Rgb representation to another system, as defined by EColorSystem.
ConvertToRgb	Sets a color transformation from any color system, as defined by EColorSystem, to the Rgb representation.
EColorLookup	Constructs a color lookup table.
Transform	Transforms a quantized color image/pixel to another quantized color image/pixel, using the previously initialized color lookup table.

WhiteBalance	Initializes a color lookup table that can be used for color adjustment, including a global gain, gamma pre-compensation [cancellation] and white balancing.

EColorLookup.AdjustGainOffset

Sets a color transformation such that a gain and offset is applied separately to each color component of a target color system.

Namespace: Euresys.Open_eVision

[C#]

```
void AdjustGainOffset(
 Euresys.Open_eVision.EColorSystem colorSystem,
 float gain0,
 float offset0,
 float gain1,
 float offset1,
 float gain2,
 float offset2
 )
```

Parameters

colorSystem

Target color system, as defined by EColorSystem.

gain0

Gain to be applied to color component 0.

offset0

Offset to be applied to color component 0.

gain1

Gain to be applied to color component 1.

offset1

Offset to be applied to color component 1.

gain2

Gain to be applied to color component 2.

offset2

Offset to be applied to color component 2.

Remarks

The input and output color systems are both Rgb. To apply some transform to a color image, you initialize a color lookup once for all and use it at will in a transformation operation such as EColorLookup::Transform.

Note. The offsets are specified as unquantized values.

EColorLookup.Calibrate

Sets a color transformation to recalibrate.

Namespace: Euresys.Open_eVision

[C#]

```
void Calibrate(
 Euresys.Open_eVision.EC24 Color0,
 float x0,
 float y0,
 float z0,
 Euresys.Open_eVision.EC24 Color1,
 float x1,
 float y1,
 float z1,
 Euresys.Open_eVision.EC24 Color2,
 float x2,
 float y2,
 float z2
 )
void Calibrate(
 Euresys.Open_eVision.EC24 Color0,
 float x0,
 float y0,
 float z0,
 Euresys.Open_eVision.EC24 Color1,
 float x1,
 float y1,
 float z1,
 Euresys.Open_eVision.EC24 Color2,
 float x2,
 float y2,
 float z2,
 Euresys.Open_eVision.EC24 Color3,
 float x3,
 float y3,
 float z3
 )
```

Parameters

Color0
Measured quantized values of a pixel of color 0.

x0
CIE XYZ tri-stimulus unquantized values corresponding to color 0.

y0
CIE XYZ tri-stimulus unquantized values corresponding to color 0.

z0
CIE XYZ tri-stimulus unquantized values corresponding to color 0.

Color1
Measured quantized values of a pixel of color 1.

x1
CIE XYZ tri-stimulus unquantized values corresponding to color 1.

y1
CIE XYZ tri-stimulus unquantized values corresponding to color 1.

z1
CIE XYZ tri-stimulus unquantized values corresponding to color 1.

Color2
Measured quantized values of a pixel of color 2.

x2
CIE XYZ tri-stimulus unquantized values corresponding to color 2.

y2
CIE XYZ tri-stimulus unquantized values corresponding to color 2.

z2
CIE XYZ tri-stimulus unquantized values corresponding to color 2.

Color3
Measured quantized values of a pixel of color 3.

x3
CIE XYZ tri-stimulus unquantized values corresponding to color 3.

y3
CIE XYZ tri-stimulus unquantized values corresponding to color 3.

z3
CIE XYZ tri-stimulus unquantized values corresponding to color 3.

color
-

x
-

y
-

z
-

Remarks

The first prototype uses 3 reference colors. The second uses 4 reference colors. To apply some transform to a color image, you initialize a color lookup once for all and use it at will in a transformation operation such as EColorLookup::Transform.

EColorLookup.ColorSystemIn

Input color system.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EColorSystem ColorSystemIn
  { get; }
```

Remarks

The EColorLookup objects keep track of the color system transformation, for consistency. When applying a transformation, the source image color system (usually Rgb) must match the *input color system*; the destination image will be automatically be typed with the *output color system*. In case of a mismatch, an error message is issued. These two values are set by the lookup table initialization functions. An uninitialized lookup table has both color systems set to NoColor.

EColorLookup.ColorSystemOut

Output color system.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EColorSystem ColorSystemOut
  { get; }
```

Remarks

The EColorLookup objects keep track of the color system transformation, for consistency. When applying a transformation, the source image color system (usually Rgb) must match the *input color system*; the destination image will be automatically be typed with the *output color system*. In case of a mismatch, an error message is issued. These two values are set by the lookup table initialization functions. An uninitialized lookup table has both color systems set to NoColor.

EColorLookup.ConvertFromRgb

Sets a color transformation from the Rgb representation to another system, as defined by EColorSystem.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvertFromRgb(
 Euresys.Open_eVision.EColorSystem colorSystem
 )
```

Parameters

colorSystem

Color system, as defined by EColorSystem.

Remarks

The input and output color systems are respectively Rgb and colorSystem. To apply some transform to a color image, you initialize a color lookup once for all and use it at will in a transformation operation such as EColorLookup::Transform.

EColorLookup.ConvertToRgb

Sets a color transformation from any color system, as defined by EColorSystem, to the Rgb representation.

Namespace: Euresys.Open_eVision

```
[C#]
void ConvertToRgb(
 Euresys.Open_eVision.EColorSystem colorSystem
 )
```

Parameters

colorSystem

Color system, as defined by EColorSystem.

Remarks

The input and output color systems are respectively colorSystem and Rgb. To apply some transform to a color image, you initialize a color lookup once for all and use it at will in a transformation operation such as EColorLookup::Transform.

EColorLookup.EColorLookup

Constructs a color lookup table.

Namespace: Euresys.Open_eVision

```
[C#]
void EColorLookup(
 )
```

EColorLookup.IndexBits

Number of bits used for indexing the lookup table.

Namespace: Euresys.Open_eVision

[C#]

```
uint IndexBits
  { get; set; }
```

Remarks

Before filling in a lookup table, it is necessary to decide how many table entries it requires. The EColorLookup::IndexBits property indicates how many (high-order) bits of the input components are used. The relation between EColorLookup::IndexBits, the number of table entries and the corresponding table size are given below:

IndexBits	Number of entries	Table size (bytes)
4	$2^{(3x4)} = 4096$	14739
5	$2^{(3x5)} = 32768$	107811
6	$2^{(3x6)} = 262144$	823875

The larger the number of entries, the more accuracy is obtained. After EColorLookup::IndexBits has been changed, the lookup table needs to be recomputed.

Note. Be aware that each time a color lookup table is filled, all the entries are recomputed. When EColorLookup::IndexBits equals 6, this may take a very long time. Such large lookup tables should be computed once only. Different combinations of EColorLookup::IndexBits and Interpolation provide a trade-off between accuracy and speed for the table pre-computation and table use.

EColorLookup.Interpolation

Interpolation mode.

Namespace: Euresys.Open_eVision

[C#]

```
bool Interpolation
  { get; set; }
```

Remarks

When applying a lookup table to transform pixel values, tri-linear interpolation can be used: * when interpolation is not used, the table is looked up at the entry closest to the pixel value. This gives an accuracy equal to the value of the IndexBits property. On the other hand, table lookup is very fast; * when interpolation is used, the table is looked up at eight neighboring entries and an adequate average is computed. This gives full accuracy (8 bits) if the transformation is smooth enough. On the other hand, table lookup is slower.

Note. The interpolation mode may be modified at any time without the need to reinitialize the lookup table.

EColorLookup.Transform

Transforms a quantized color image/pixel to another quantized color image/pixel, using the previously initialized color lookup table.

Namespace: Euresys.Open_eVision

```
[C#]
void Transform(
 Euresys.Open_eVision.EC24 sourceImageColor,
 out Euresys.Open_eVision.EC24 destinationImageColor
 )
void Transform(
 Euresys.Open_eVision.ERGBIC24 sourceImage,
 Euresys.Open_eVision.ERGBIC24 destinationImage
 )
```

Parameters

sourceImageColor
Input color image.

destinationImageColor
Output color image.

sourceImage
Input color image.

destinationImage
Output color image.

EColorLookup.WhiteBalance

Initializes a color lookup table that can be used for color adjustment, including a global gain, gamma pre-compensation [cancellation] and white balancing.

Namespace: Euresys.Open_eVision

```
[C#]
void WhiteBalance(
 float gain,
 float gamma,
 float balanceRed,
 float balanceGreen,
 float balanceBlue
 )
```

Parameters

gain

Global gain to be applied to all three color components. By default, the image intensity remains unchanged.

gamma

Gamma exponent. Setting this parameter will cancel the gamma pre-compensation feature of the camera, or apply it. By default, the no gamma pre-compensation is assumed (linear response). The gamma exponent can be chosen among the predefined values EasyColor::CompensateNtscGamma /EasyColor::CompensatePalGamma/EasyColor::CompensateSmpteGamma (pre-compensation) or EasyColor::NtscGamma/EasyColor::PalGamma/EasyColor::SmpteGamma (pre-compensation cancellation), or be user-defined.

balanceRed

Color values to be used for white balance. These parameters should be set to the measured average values of a white (or gray) pixels area, allowing the white balance to adjust pre-component gains appropriately. Use function EasyImage::PixelAverage to obtain them. By default, no white balancing is performed.

balanceGreen

Color values to be used for white balance. These parameters should be set to the measured average values of a white (or gray) pixels area, allowing the white balance to adjust pre-component gains appropriately. Use function EasyImage::PixelAverage to obtain them. By default, no white balancing is performed.

balanceBlue

Color values to be used for white balance. These parameters should be set to the measured average values of a white (or gray) pixels area, allowing the white balance to adjust pre-component gains appropriately. Use function EasyImage::PixelAverage to obtain them. By default, no white balancing is performed.

Remarks

To apply some transform to a color image, you initialize the color lookup once for all and use it at will with EColorLookup::Transform or EasyColor::TransformBayer operation.

4.66. EColorRangeThresholdSegmenter Class

Segments an image using a double threshold on a color image.

Remarks

This segmenter is applicable to EROIC24 RGB color images. It produces coded images with two layers: The White layer (usually, with index 1) contains the unmasked pixels that belong to the cube of the RGB space that spans the low threshold point to the high threshold point; and the Black layer (usually, with index 0) contains the remaining unmasked pixels.

Base Class:ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

HighThreshold	Value of the high threshold.
LowThreshold	Value of the low threshold.

Methods

Load	Load the EColorRangeThresholdSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the EColorRangeThresholdSegmenter configuration. The given ESerializer must have been created for writing.

EColorRangeThresholdSegmenter.HighThreshold

Value of the high threshold.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EC24 HighThreshold
  { get; set; }
```

EColorRangeThresholdSegmenter.Load

Load the EColorRangeThresholdSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EColorRangeThresholdSegmenter.LowThreshold

Value of the low threshold.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EC24 LowThreshold
  { get; set; }
```

EColorRangeThresholdSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
bool operator==(
 Euresys.Open_eVision.Segmenters.EColorRangeThresholdSegmenter other
 )
```

Parameters

other
Other segmenter to compare to.

EColorRangeThresholdSegmenter.Save

Save the EColorRangeThresholdSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

4.67. EColorSingleThresholdSegmenter Class

Segments an image using a single threshold on a color image.

Remarks

This segmenter is applicable to EROIC24 RGB color images. It produces coded images with two layers: The White layer (usually, with index 1) contains the unmasked pixels that belong to the cube of the RGB space defined by the threshold point and the white point (255,255,255); and the Black layer (usually, with index 0) contains the remaining unmasked pixels.

Base Class:ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

Threshold	Value of the threshold.

Methods

Load	Load the EColorSingleThresholdSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the EColorSingleThresholdSegmenter configuration. The given ESerializer must have been created for writing.

EColorSingleThresholdSegmenter.Load

Load the EColorSingleThresholdSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EColorSingleThresholdSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
bool operator==(
 Euresys.Open_eVision.Segmenters.EColorSingleThresholdSegmenter other
 )
```

Parameters

other
Other segmenter to compare to.

EColorSingleThresholdSegmenter.Save

Save the EColorSingleThresholdSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EColorSingleThresholdSegmenter.Threshold

Value of the threshold.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
Euresys.Open_eVision.EC24 Threshold
  { get; set; }
```

4.68. EColorVector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EColorVector member, and then add elements one at time at the tail by calling the EColorVector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EColorVector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
EColorVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EColorVector object into the current EColorVector object
SetElement	Modifies the vector element at the given index by the given value.

EColorVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 Euresys.Open_eVision.EColor element
 )
```

Parameters

element

The element to be added.

EColorVector.EColorVector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EColorVector(
 )
void EColorVector(
 uint un32MaxElements
 )
void EColorVector(
 Euresys.Open_eVision.EColorVector other
 )
```

Parameters

un32MaxElements

-

other

EColorVector object to be copied

EColorVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EColor GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EColorVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EColorVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EColor operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EColorVector (excluded) of the element to be accessed.

EColorVector.operator=

Copies all the data from another EColorVector object into the current EColorVector object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EColorVector operator=(
 Euresys.Open_eVision.EColorVector other
 )
```

Parameters

other

EColorVector object to be copied

EColorVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr RawDataPtr
```

```
{ get; }
```

EColorVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EColor value
 )
```

Parameters

index

Index, between 0 and EColorVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.69. EConverter Class

Conversion functions between bit depth formats of various 3D classes.

Namespace: Euresys.Open_eVision.Easy3D

Methods

Convert	Converts EDepthMap or EZMap between various formats.

EConverter.Convert

Converts EDepthMap or EZMap between various formats.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap8 DepthMapIn,
 Euresys.Open_eVision.Easy3D.EDepthMap16 DepthMapOut,
 Euresys.Open_eVision.Easy3D.EMapConversionMode ConversionMode
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap8 DepthMapIn,
 Euresys.Open_eVision.Easy3D.EDepthMap32f DepthMapOut
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap16 DepthMapIn,
 Euresys.Open_eVision.Easy3D.EDepthMap8 DepthMapOut,
 Euresys.Open_eVision.Easy3D.EMapConversionMode ConversionMode
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap16 DepthMapIn,
 Euresys.Open_eVision.Easy3D.EDepthMap32f DepthMapOut
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap32f DepthMapIn,
 Euresys.Open_eVision.Easy3D.EDepthMap8 DepthMapOut
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap32f DepthMapIn,
 Euresys.Open_eVision.Easy3D.EDepthMap16 DepthMapOut
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap8 ZMapIn,
 Euresys.Open_eVision.Easy3D.EZMap16 ZMapOut,
 Euresys.Open_eVision.Easy3D.EMapConversionMode ConversionMode
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap8 ZMapIn,
 Euresys.Open_eVision.Easy3D.EZMap32f ZMapOut
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap16 ZMapIn,
 Euresys.Open_eVision.Easy3D.EZMap8 ZMapOut,
 Euresys.Open_eVision.Easy3D.EMapConversionMode ConversionMode
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap16 ZMapIn,
 Euresys.Open_eVision.Easy3D.EZMap32f ZMapOut
 )
```

```
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap32f ZMapIn,
 Euresys.Open_eVision.Easy3D.EZMap8 ZMapOut
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap32f MapIn,
 Euresys.Open_eVision.Easy3D.EZMap16 MapOut
 )
```

Parameters

DepthMapIn

The input DepthMap (8, 16 or 32 bits)

DepthMapOut

The output DepthMap (8, 16 or 32 bits)

ConversionMode

The conversion mode from EMapConversionMode defines how to transform the pixel value from a format (8, 16 or 32 bits) to another.
MaxDynamic maximizes the used range.
Shift converts by bit shifting.
By default, the mode MaxDynamic is selected.

ZMapIn

The input ZMap (8, 16 or 32 bits)

ZMapOut

The output ZMap (8, 16 or 32 bits)

MapIn

-

MapOut

-

Remarks

Conversion from or to 32bits only supports MaxDynamic mode. The undefined values are converted to the new map undefined value. For 8 and 16 bits images, the minimum defined value is 1, so the conversion of 32 bits images to 8 or 16 bits images adapts the dynamic range between 1 and the maximum value. For conversion to 32 bits float image, the used dynamic range is between 0 and FLOATMAX.

4.70. EDataAugmentation Class

An EDataAugmentation object is responsible for storing the data augmentation parameters and generating new transformed images from existing ones. Deep learning algorithms are not invariant to the location, scale, or rotation of the elements of interest in the image. Thus, if the final application requires the deep learning algorithm to be invariant to those characteristics, the dataset must contain images covering the spectrum of those characteristics. Data augmentation can be used to avoid capturing in the original dataset the whole spectrum of those characteristics by automatically generating new versions of the images in the dataset that are shifted, scaled or rotated to cover this spectrum. When generating a new image, the EDataAugmentation will randomly pick transformation value within the specified limits. When using data augmentation, one must carefully chose the spectrum of transformations such that the element of interest are still visible in the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

EnableHorizontalFlip	Sets whether to use horizontally flipped versions of input images.
EnableVerticalFlip	Sets whether to use vertically flipped versions of input images.
GaussianNoiseMaximumStandardDeviation	The Gaussian noise maximum standard deviation. The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EDataAugmentation and EDataAugmentation.(also called the normal distribution). Its value must be superior or equal to EDataAugmentation.
GaussianNoiseMinimumStandardDeviation	The Gaussian noise minimum standard deviation. The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EDataAugmentation and EDataAugmentation.(also called the normal distribution). Its value must be betwteen 0 and EDataAugmentation.
MaxBrightnessOffset	Sets the maximum absolute brightness offset. It must be between 0 and 1.
MaxContrastGain	Sets the maximum contrast gain. Its value must be strictly positive and over EDataAugmentation::MinContrastGain.
MaxGamma	Sets the maximum gamma for gamma correction. Its value must be higher than EDataAugmentation::MinGamma.
MaxHorizontalShear	Sets the maximum absolute horizontal shear, represented as an angle from the vertical direction. Its value must be between 0 and 90 degrees.
MaxHorizontalShift	Sets the maximum horizontal shift allowed.
MaxHueOffset	Sets the maximum absolute hue offset. Its value must be between 0 and 180 degrees.
MaxRotationAngle	Set the maximum rotation angle allowed. Its value must be between 0 and 180 degrees.

MaxSaturationGain	Sets the maximum saturation gain. Its value must be over or equal to EDataAugmentation::MinSaturationGain.
MaxScale	Sets the maximum scaling allowed. Its value must be strictly positive and over EDataAugmentation::MinScale.
MaxStainColor	The maximum color value from which to draw a color to fill in the stain (we use a gaussian distribution of with a mean betweeen EDataAugmentation::MinStainColor and EDataAugmentation::MaxStainColor) Its value must be bigger than EDataAugmentation::MinStainColor.
MaxVerticalShear	Sets the maximum absolute vertical shear, represented as an angle from the horizontal direction. Its value must be between 0 and 90 degrees.
MaxVerticalShift	Sets the maximum vertical shift allowed.
MinContrastGain	Sets the minimum contrast gain. Its value must be strictly positive and below EDataAugmentation::MaxContrastGain.
MinGamma	Sets the minimum gamma for gamma correction. Its value must be strictly positive and below EDataAugmentation::MaxGamma.
MinSaturationGain	Sets the minimum saturation gain. Its value must be strictly positive.
MinScale	Sets the minimum scaling allowed. Its value must be strictly positive and below EDataAugmentation::MaxScale.
MinStainColor	The minimum color value from which to draw a color to fill in the stain (we use a gaussian distribution of with a mean betweeen EDataAugmentation::MinStainColor and EDataAugmentation::MaxStainColor) Its value must be inferior to 255 and EDataAugmentation::MaxStainColor.
SaltAndPepperNoiseMaximumDensity	The maximum density of the salt and pepper noise. The salt and pepper noise sets the value of a number of randomly selected (between EDataAugmentation and EDataAugmentation) pixels to its minimum or maximum value. Its value must be betwteen EDataAugmentation and 1.
SaltAndPepperNoiseMinimumDensity	The minimum density of the salt and pepper noise. The salt and pepper noise sets the value of a number of randomly selected (between EDataAugmentation and EDataAugmentation) pixels to its minimum or maximum value. Its value must be betwteen 0 and EDataAugmentation.
SpeckleNoiseMaximumStandardDeviation	The speckle noise maximum standard deviation. The speckle noise is a multiplicative noise sampled from a Gamma distribution of deviation between EDataAugmentation and EDataAugmentation. Its value must be strictly higher than EDataAugmentation.
SpeckleNoiseMinimumStandardDeviation	The speckle noise minimum standard deviation. The speckle noise is a multiplicative noise sampled from a Gamma distribution of deviation between EDataAugmentation and EDataAugmentation. Its value must be strictly positive and lower than EDataAugmentation.

StainBlur	Stain blur. The stain blur is the half kernel size of a Gaussian filter that is applied on the stain to smooth its edges and therefore the transition between the original image and the stain.
StainColorVariation	The variation of the color used to fill in the ellipse (We use an gaussian distribution of standart mean deviation stainColorVariation).
StainDisruptionMaxAnchorPoints	The maximum number of anchor points to use while disrupting the ellipse.
StainDisruptionMaxIntensity	The maximun offset applied to the coordinates (x,y) of a pixel from the ellipse contour.
StainEllipseMaxRadius	The maximum radius of the ellipse used to produce the stain. Its value must be superior to EDataAugmentation::StainEllipseMinRadius.
StainEllipseMinRadius	The minimum radius of the ellipse used to produce the stain. Its value must be inferior to EDataAugmentation::StainEllipseMaxRadius.
StainInterpolationSiteFactor	The factor to compute the number of interpolation sites to use from the number of anchor points.
StainProbability	Probability of applying the stain data augmentation (default value: 0, i.e. no stain).

Methods

CopyTo	Copies itself to the EDataAugmentation object other.
EDataAugmentation	Creates an EDataAugmentation object.
Generate	Generates a new image from a generic EBaseROI image. The caller is responsible for calling freeing the memory of the returned image by calling delete on the image.
HasDataAugmentations	Whether the EDataAugmentation object contains augmentations.
Load	Loads an EDataAugmentation object. The given ESerializer must have been created for reading.
operator=	Copies the EDataAugmentation object other to this object.
operator==	Equality operator.
Save	Saves an EDataAugmentation object. The given ESerializer must have been created for writing.

EDataAugmentation.CopyTo

Copies itself to the EDataAugmentation object other.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation other
 )
```

Parameters

other

-

EDataAugmentation.EDataAugmentation

Creates an EDataAugmentation object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EDataAugmentation(
 )
void EDataAugmentation(
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation other
 )
```

Parameters

other

-

EDataAugmentation.EnableHorizontalFlip

Sets whether to use horizontally flipped versions of input images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool EnableHorizontalFlip
  { get; set; }
```

EDataAugmentation.EnableVerticalFlip

Sets whether to use vertically flipped versions of input images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool EnableVerticalFlip
```

```
{ get; set; }
```

EDataAugmentation.GaussianNoiseMaximumStandardDeviation

The Gaussian noise maximum standard deviation.
The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EDataAugmentation and EDataAugmentation.(also called the normal distribution).
Its value must be superior or equal to EDataAugmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GaussianNoiseMaximumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EDataAugmentation.GaussianNoiseMinimumStandardDeviation

The Gaussian noise minimum standard deviation.
The Gaussian noise is an additive noise sampled from a Gaussian distribution of deviation between EDataAugmentation and EDataAugmentation.(also called the normal distribution).
Its value must be betwteen 0 and EDataAugmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GaussianNoiseMinimumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EDataAugmentation.Generate

Generates a new image from a generic EBaseROI image. The caller is responsible for calling freeing the memory of the returned image by calling delete on the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EBaseROI Generate(
 Euresys.Open_eVision.EBaseROI img,
 Euresys.Open_eVision.EasyDeepLearning.EDLDataAugmentationType type
 )
```

```
void Generate(
 Euresys.Open_eVision.EROIBW8 source,
 Euresys.Open_eVision.EROIBW8 dest,
 Euresys.Open_eVision.EasyDeepLearning.EDLDataAugmentationType type
 )
void Generate(
 Euresys.Open_eVision.EROIBW16 source,
 Euresys.Open_eVision.EROIBW16 dest,
 Euresys.Open_eVision.EasyDeepLearning.EDLDataAugmentationType type
 )
void Generate(
 Euresys.Open_eVision.EROIC24 source,
 Euresys.Open_eVision.EROIC24 dest,
 Euresys.Open_eVision.EasyDeepLearning.EDLDataAugmentationType type
 )
```

Parameters

img
The image to transform.

type
The type of transformation to generate.

source
The image to transform.

dest
The transformed image.

Remarks

If the data augmentation fails, the method will throw an exception.

EDataAugmentation.HasDataAugmentations

Whether the EDataAugmentation object contains augmentations.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasDataAugmentations(
 )
```

EDataAugmentation.Load

Loads an EDataAugmentation object. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EDataAugmentation.MaxBrightnessOffset

Sets the maximum absolute brightness offset. It must be between 0 and 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxBrightnessOffset
  { get; set; }
```

Remarks

Brightness transformation is performed by adding a value taken between -EDataAugmentation::MaxBrightnessOffset and +EDataAugmentation::MaxBrightnessOffset to each pixel of the normalized image.

EDataAugmentation.MaxContrastGain

Sets the maximum contrast gain. Its value must be strictly positive and over EDataAugmentation::MinContrastGain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxContrastGain
  { get; set; }
```

Remarks

Contrast transformation is performed by multiplying each mean-centered pixel value by a gain value taken between EDataAugmentation::MinContrastGain and EDataAugmentation::MaxContrastGain. A contrast transformation does not change the overall brightness of an image.

EDataAugmentation.MaxGamma

Sets the maximum gamma for gamma correction. Its value must be higher than EDataAugmentation::MinGamma.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxGamma
  { get; set; }
```

Remarks

Gamma correction transformation is performed by raising each normalized pixel value to the power of gamma with gamma taken between EDataAugmentation::MinGamma and EDataAugmentation::MaxGamma.

EDataAugmentation.MaxHorizontalShear

Sets the maximum absolute horizontal shear, represented as an angle from the vertical direction. Its value must be between 0 and 90 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxHorizontalShear
  { get; set; }
```

EDataAugmentation.MaxHorizontalShift

Sets the maximum horizontal shift allowed.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int MaxHorizontalShift
  { get; set; }
```

EDataAugmentation.MaxHueOffset

Sets the maximum absolute hue offset. Its value must be between 0 and 180 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxHueOffset
  { get; set; }
```

Remarks

The hue is represented as an angle between 0 and 360 degrees. The hue transformation is performed by rotating the hue of each pixel by a value between -EDataAugmentation::MaxHueOffset and +EDataAugmentation::MaxHueOffset. This transformation only works for color images.

EDataAugmentation.MaxRotationAngle

Set the maximum rotation angle allowed. Its value must be between 0 and 180 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxRotationAngle
  { get; set; }
```

EDataAugmentation.MaxSaturationGain

Sets the maximum saturation gain. Its value must be over or equal to EDataAugmentation::MinSaturationGain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxSaturationGain
  { get; set; }
```

Remarks

The saturation transformation is performed by multiplying the saturation of each pixel by a value between EDataAugmentation::MinSaturationGain and EDataAugmentation::MaxSaturationGain.

EDataAugmentation.MaxScale

Sets the maximum scaling allowed. Its value must be strictly positive and over EDataAugmentation::MinScale.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxScale
```

```
{ get; set; }
```

EDataAugmentation.MaxStainColor

The maximum color value from which to draw a color to fill in the stain (we use a gaussian distribution of with a mean betweeen EDataAugmentation::MinStainColor and EDataAugmentation::MaxStainColor)
Its value must be bigger than EDataAugmentation::MinStainColor.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
byte MaxStainColor
    { get; set; }
```

EDataAugmentation.MaxVerticalShear

Sets the maximum absolute vertical shear, represented as an angle from the horizontal direction. Its value must be between 0 and 90 degrees.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float MaxVerticalShear
    { get; set; }
```

EDataAugmentation.MaxVerticalShift

Sets the maximum vertical shift allowed.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int MaxVerticalShift
    { get; set; }
```

EDataAugmentation.MinContrastGain

Sets the minimum contrast gain. Its value must be strictly positive and below EDataAugmentation::MaxContrastGain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinContrastGain
  { get; set; }
```

Remarks

Contrast transformation is performed by multiplying each mean-centered pixel value by a gain value taken between EDataAugmentation::MinContrastGain and EDataAugmentation::MaxContrastGain. A contrast transformation does not change the overall brightness of an image.

EDataAugmentation.MinGamma

Sets the minimum gamma for gamma correction. Its value must be strictly positive and below EDataAugmentation::MaxGamma.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinGamma
  { get; set; }
```

Remarks

Gamma correction transformation is performed by raising each normalized pixel value to the power of gamma with gamma taken between EDataAugmentation::MinGamma and EDataAugmentation::MaxGamma.

EDataAugmentation.MinSaturationGain

Sets the minimum saturation gain. Its value must be strictly positive.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinSaturationGain
  { get; set; }
```

Remarks

The saturation transformation is performed by multiplying the saturation of each pixel by a value between EDataAugmentation::MinSaturationGain and EDataAugmentation::MaxSaturationGain.

EDataAugmentation.MinScale

Sets the minimum scaling allowed. Its value must be strictly positive and below EDataAugmentation::MaxScale.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float MinScale
  { get; set; }
```

EDataAugmentation.MinStainColor

The minimum color value from which to draw a color to fill in the stain (we use a gaussian distribution of with a mean betweeen EDataAugmentation::MinStainColor and EDataAugmentation::MaxStainColor)
Its value must be inferior to 255 and EDataAugmentation::MaxStainColor.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
byte MinStainColor
  { get; set; }
```

EDataAugmentation.operator=

Copies the EDataAugmentation object other to this object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation other
 )
```

Parameters

other

-

EDataAugmentation.operator==

Equality operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool operator==(
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation other
 )
```

Parameters

other

Other object to compare to

EDataAugmentation.SaltAndPepperNoiseMaximumDensity

The maximum density of the salt and pepper noise.
The salt and pepper noise sets the value of a number of randomly selected (between EDataAugmentation and EDataAugmentation) pixels to its minimum or maximum value.
Its value must be betwteen EDataAugmentation and 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SaltAndPepperNoiseMaximumDensity
  { get; set; }
```

Remarks

This noise is computed after all the other noises.

EDataAugmentation.SaltAndPepperNoiseMinimumDensity

The minimum density of the salt and pepper noise.
The salt and pepper noise sets the value of a number of randomly selected (between EDataAugmentation and EDataAugmentation) pixels to its minimum or maximum value.
Its value must be betwteen 0 and EDataAugmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SaltAndPepperNoiseMinimumDensity
  { get; set; }
```

Remarks

This noise is computed after all the other noises.

EDataAugmentation.Save

Saves an EDataAugmentation object. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string path
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EDataAugmentation.SpeckleNoiseMaximumStandardDeviation

The speckle noise maximum standard deviation.
The speckle noise is a multiplicative noise sampled from a Gamma distribution of deviation between EDataAugmentation and EDataAugmentation.
Its value must be strictly higher than EDataAugmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SpeckleNoiseMaximumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EDataAugmentation.SpeckleNoiseMinimumStandardDeviation

The speckle noise minimum standard deviation.
The speckle noise is a multiplicative noise sampled from a Gamma distribution of deviation between EDataAugmentation and EDataAugmentation.
Its value must be strictly positive and lower than EDataAugmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SpeckleNoiseMinimumStandardDeviation
  { get; set; }
```

Remarks

This noise is computed before the salt and paper noise.

EDataAugmentation.StainBlur

Stain blur.
The stain blur is the half kernel size of a Gaussian filter that is applied on the stain to smooth its edges and therefore the transition between the original image and the stain.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int StainBlur
  { get; set; }
```

EDataAugmentation.StainColorVariation

The variation of the color used to fill in the ellipse (We use an gaussian distribution of standart mean deviation stainColorVariation).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint StainColorVariation
  { get; set; }
```

EDataAugmentation.StainDisruptionMaxAnchorPoints

The maximum number of anchor points to use while disrupting the ellipse.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint StainDisruptionMaxAnchorPoints
  { get; set; }
```

EDataAugmentation.StainDisruptionMaxIntensity

The maximun offset applied to the coordinates (x,y) of a pixel from the ellipse contour.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float StainDisruptionMaxIntensity
  { get; set; }
```

EDataAugmentation.StainEllipseMaxRadius

The maximum radius of the ellipse used to produce the stain.
Its value must be superior to EDataAugmentation::StainEllipseMinRadius.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint StainEllipseMaxRadius
  { get; set; }
```

EDataAugmentation.StainEllipseMinRadius

The minimum radius of the ellipse used to produce the stain.
Its value must be inferior to EDataAugmentation::StainEllipseMaxRadius.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint StainEllipseMinRadius
  { get; set; }
```

EDataAugmentation.StainInterpolationSiteFactor

The factor to compute the number of interpolation sites to use from the number of anchor points.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float StainInterpolationSiteFactor
  { get; set; }
```

EDataAugmentation.StainProbability

Probability of applying the stain data augmentation (default value: 0, i.e. no stain).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float StainProbability
  { get; set; }
```

4.71. EDatasetSplit Class

The EDatasetSplit maps the image indexes of a EClassificationDataset to a dataset split type (EDatasetType).
The image indexes mapped in the object are consecutive and between 0 and EDatasetSplit::GetNumImages - 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

DatasetMapping	Mapping between image indexes and the corresponding dataset split type. The value at index i of the vector is the dataset split type for the image index i.
NumLockedImages	Number of images for which the dataset type is locked.

Methods

CopyTo	Copy the dataset split to the other instance.
EDatasetSplit	Creates a EDatasetSplit.
GetImageType	Dataset type for the given image index.
GetImageTypeLocked	Whether the image type is locked for the given image. This property is mainly used to lock training and validation images after the split was used in a training.
GetNumImages	Number of image indexes associated in the object.
GetSplit	Image indexes corresponding to the given type.
HasLockedImages	Whether the split contains images for which the dataset type is locked.
Load	Load the EDatasetSplit configuration. The given ESerializer must have been created for reading.
operator=	Assigment operator.
Save	Save the EDatasetSplit configuration. The given ESerializer must have been created for writing.
SetImageType	Dataset type for the given image index.
SetImageTypeLocked	Whether the image type is locked for the given image. This property is mainly used to lock training and validation images after the split was used in a training.
SetTypeLocked	Locks or unlocks all the images whose dataset type matches the given type. Note that the given type can be a combination of several dataset type (using the | operator).

EDatasetSplit.CopyTo

Copy the dataset split to the other instance.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit other
 )
```

Parameters

other

Other instance of EDatasetSplit

EDatasetSplit.DatasetMapping

Mapping between image indexes and the corresponding dataset split type.
The value at index i of the vector is the dataset split type for the image index i.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDatasetType[] DatasetMapping
  { get; }
```

EDatasetSplit.EDatasetSplit

Creates a EDatasetSplit.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EDatasetSplit(
 )

void EDatasetSplit(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetType[] mapping
 )

void EDatasetSplit(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit other
 )
```

Parameters

mapping
Vector where the value at index i is the dataset type for image i.

other
Other instance of EDatasetSplit

EDatasetSplit.GetImageType

Dataset type for the given image index.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDatasetType GetImageType(
 int imageIndex
 )
```

Parameters

imageIndex
Image index.

EDatasetSplit.GetImageTypeLocked

Whether the image type is locked for the given image.
This property is mainly used to lock training and validation images after the split was used in a training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool GetImageTypeLocked(
 int imageIndex
 )
```

Parameters

imageIndex
Image index.

EDatasetSplit.GetNumImages

Number of image indexes associated in the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumImages(
 )
int GetNumImages(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetType type
 )
```

Parameters

type

Dataset split type

EDatasetSplit.GetSplit

Image indexes corresponding to the given type.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int[] GetSplit(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetType type
 )
```

Parameters

type

-

EDatasetSplit.HasLockedImages

Whether the split contains images for which the dataset type is locked.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasLockedImages(
 )
```

EDatasetSplit.Load

Load the EDatasetSplit configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EDatasetSplit.NumLockedImages

Number of images for which the dataset type is locked.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLockedImages
  { get; }
```

EDatasetSplit.operator=

Assigment operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit other
 )
```

Parameters

other

Other instance of EDatasetSplit

EDatasetSplit.Save

Save the EDatasetSplit configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EDatasetSplit.SetImageType

Dataset type for the given image index.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetImageType(
 int imageIndex,
 Euresys.Open_eVision.EasyDeepLearning.EDatasetType type
 )
```

Parameters

imageIndex
Image index.

type
Dataset split type.

EDatasetSplit.SetImageTypeLocked

Whether the image type is locked for the given image.
This property is mainly used to lock training and validation images after the split was used in a training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetImageTypeLocked(
 int imageIndex,
 bool isLocked
 )
```

Parameters

imageIndex
Image index.

isLocked
Whether to lock the image

EDatasetSplit.SetTypeLocked

Locks or unlocks all the images whose dataset type matches the given type. Note that the given type can be a combination of several dataset type (using the | operator).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetTypeLocked(
 int type,
 bool isLocked
 )
```

Parameters

type
Dataset type to lock.

isLocked
Whether to lock the images

4.72. EDecimator Class

Decimation of a point cloud/ZMap/DepthMap.

Derived Class(es):EGridDecimatorERandomDecimator

Namespace: Euresys.Open_eVision.Easy3D

Methods

Decimate	Decimates a EPointCloud.
EDecimator	Creates an EDecimator object.
Load	Loads the decimator configuration. The given ESerializer must have been created for reading.
operator!=	test inequality between two EDecimator.
operator==	test equality between two EDecimator.
Save	Saves the decimator configuration. The given ESerializer must have been created for writing.

EDecimator.Decimate

Decimates a EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Decimate(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut
 )
```

Parameters

cloudIn

The input point cloud.

cloudOut

The output point cloud.

EDecimator.EDecimator

Creates an EDecimator object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EDecimator(
 )
```

EDecimator.Load

Loads the decimator configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EDecimator.operator!=

test inequality between two EDecimator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator!=(
 Euresys.Open_eVision.Easy3D.EDecimator other
 )
```

Parameters

other
the EDecimator to be compared with

EDecimator.operator==

test equality between two EDecimator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.EDecimator other
 )
```

Parameters

other
the EDecimator to be compared with

EDecimator.Save

Saves the decimator configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

4.73. EDeepLearningBenchmark Class

Deep Learning benchmark results.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

BenchmarkHeight	Height of the images generated in the benchmark. It depends on EDeepLearningBenchmark::DatasetHeight and EDeepLearningBenchmarkSettings::InternalResizeDisabled).
BenchmarkSettings	Settings of the benchmark.
BenchmarkWidth	Width of the images generated in the benchmark. It depends on EDeepLearningBenchmark::DatasetWidth and EDeepLearningBenchmarkSettings::InternalResizeDisabled).
DatasetHeight	Height of the dataset used to run the benchmark.
DatasetWidth	Width of the dataset used to run the benchmark.
ErrorCode	Error code thrown when computing the benchmark.
ErrorDescription	Description of the error that occurred during the benchmark.
MaxLatency	Maximum latency (time between the acquisition of an image and the computation of its result).
MaxTimePerImage	Maximum time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).
MaxTimePerInference	Maximum time for a single inference call (in seconds).
MeanLatency	Mean latency.
MeanTimePerImage	Mean time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).

MeanTimePerInference	Mean time for a single inference call (in seconds).
MinLatency	Minimum latency (time between the acquisition of an image and the computation of its result).
MinTimePerImage	Minimum time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).
MinTimePerInference	Minimum time for a single inference call (in seconds).
NumDroppedInference	The number of dropped inference call. Dropped inference call happens when simulating a camera framerate and the processing speed isn't fast enough.
NumImagesByInference	The number of images that were processed together in one inference call to exploit the specified batch size. For EasyClassify and EasyLocate, this is equal to the batch size. For EasySegment, it depends on the number of patches that are extracted from input images.
NumInferences	Number of inference made in the benchmark. It is equal to the number of images divided by EDeepLearningBenchmark.
StdTimePerImage	Standard deviation of the time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).
StdTimePerInference	Standard deviation of the inference time for a single inference call (in seconds).
Throughput	Number of images per second that were processed by the Deep Learning tool.
TimePerInference	Inference time (in nanoseconds) for all the inference calls (an inference processes EDeepLearningBenchmark::NumImagesByInference images together). A time of 0 means that the images for this inference call were dropped (not processed).

Methods

EDeepLearningBenchmark	-
IsValid	Whether the benchmark is ready and valid.
Load	Load a EDeepLearningBenchmark object. The given ESerializer must have been created for reading.
operator=	-
Save	Save the EDeepLearningBenchmark object. The given ESerializer must have been created for writing.

EDeepLearningBenchmark.BenchmarkHeight

Height of the images generated in the benchmark. It depends on EDeepLearningBenchmark::DatasetHeight and EDeepLearningBenchmarkSettings::InternalResizeDisabled).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BenchmarkHeight
  { get; }
```

EDeepLearningBenchmark.BenchmarkSettings

Settings of the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmarkSettings BenchmarkSettings
  { get; }
```

EDeepLearningBenchmark.BenchmarkWidth

Width of the images generated in the benchmark. It depends on EDeepLearningBenchmark::DatasetWidth and EDeepLearningBenchmarkSettings::InternalResizeDisabled).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BenchmarkWidth
  { get; }
```

EDeepLearningBenchmark.DatasetHeight

Height of the dataset used to run the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int DatasetHeight
  { get; }
```

EDeepLearningBenchmark.DatasetWidth

Width of the dataset used to run the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int DatasetWidth
  { get; }
```

EDeepLearningBenchmark.EDeepLearningBenchmark

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EDeepLearningBenchmark(
 )
void EDeepLearningBenchmark(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark other
 )
void EDeepLearningBenchmark(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmarkSettings settings
 )
```

Parameters

other

-

settings

-

EDeepLearningBenchmark.ErrorCode

Error code thrown when computing the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EError ErrorCode
  { get; }
```

EDeepLearningBenchmark.ErrorDescription

Description of the error that occurred during the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string ErrorDescription
  { get; }
```

EDeepLearningBenchmark.IsValid

Whether the benchmark is ready and valid.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

EDeepLearningBenchmark.Load

Load a EDeepLearningBenchmark object. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string filePath
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for reading.

EDeepLearningBenchmark.MaxLatency

Maximum latency (time between the acquisition of an image and the computation of its result).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MaxLatency
  { get; }
```

EDeepLearningBenchmark.MaxTimePerImage

Maximum time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MaxTimePerImage
  { get; }
```

EDeepLearningBenchmark.MaxTimePerInference

Maximum time for a single inference call (in seconds).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MaxTimePerInference
  { get; }
```

EDeepLearningBenchmark.MeanLatency

Mean latency.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MeanLatency
  { get; }
```

EDeepLearningBenchmark.MeanTimePerImage

Mean time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MeanTimePerImage
  { get; }
```

EDeepLearningBenchmark.MeanTimePerInference

Mean time for a single inference call (in seconds).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MeanTimePerInference
  { get; }
```

EDeepLearningBenchmark.MinLatency

Minimum latency (time between the acquisition of an image and the computation of its result).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MinLatency
  { get; }
```

EDeepLearningBenchmark.MinTimePerImage

Minimum time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MinTimePerImage
  { get; }
```

EDeepLearningBenchmark.MinTimePerInference

Minimum time for a single inference call (in seconds).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double MinTimePerInference
  { get; }
```

EDeepLearningBenchmark.NumDroppedInference

The number of dropped inference call.
Dropped inference call happens when simulating a camera framerate and the processing speed isn't fast enough.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumDroppedInference
  { get; }
```

EDeepLearningBenchmark.NumImagesByInference

The number of images that were processed together in one inference call to exploit the specified batch size.
For EasyClassify and EasyLocate, this is equal to the batch size.
For EasySegment, it depends on the number of patches that are extracted from input images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImagesByInference
  { get; }
```

EDeepLearningBenchmark.NumInferences

Number of inference made in the benchmark. It is equal to the number of images divided by EDeepLearningBenchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumInferences
```

```
{ get; }
```

EDeepLearningBenchmark.operator=

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark other
 )
```

Parameters

other

-

EDeepLearningBenchmark.Save

Save the EDeepLearningBenchmark object. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string filePath
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for writing.

EDeepLearningBenchmark.StdTimePerImage

Standard deviation of the time in seconds for an image (equal to EDeepLearningBenchmark / EDeepLearningBenchmark::NumImagesByInference).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double StdTimePerImage
  { get; }
```

EDeepLearningBenchmark.StdTimePerInference

Standard deviation of the inference time for a single inference call (in seconds).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double StdTimePerInference
  { get; }
```

EDeepLearningBenchmark.Throughput

Number of images per second that were processed by the Deep Learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double Throughput
  { get; }
```

EDeepLearningBenchmark.TimePerInference

Inference time (in nanoseconds) for all the inference calls (an inference processes EDeepLearningBenchmark::NumImagesByInference images together). A time of 0 means that the images for this inference call were dropped (not processed).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
double[] TimePerInference
  { get; }
```

4.74. EDeepLearningBenchmarkSettings Class

Class representing the settings of a Deep Learning benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

BatchSize	Batch size.
CameraSpeed	Camera speed to simulate. If equal to 0, the benchmark will produce images as fast as possible.
Device	Device to use for the benchmark.
Engine	Deep Learning engine to use for the benchmark.
InferencePrecision	Inference precision to use for the benchmark.
InternalResizeDisabled	Whether to disable the internal resize operation performed by the Deep Learning tools. When disabled, the benchmark will generate images at the optimal size for the tool.
Name	Name of the benchmark.
NumExternalThreads	Number of external threads.
NumImages	Number of images to use during the benchmark.
NumInternalThreads	Number of internal threads.

Methods

EDeepLearningBenchmarkSettings	-
Load	Loads a EDeepLearningBenchmarkSettings object. The given ESerializer must have been created for reading.
operator=	-
Save	Saves the EDeepLearningBenchmarkSettings object. The given ESerializer must have been created for writing.

EDeepLearningBenchmarkSettings.BatchSize

Batch size.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BatchSize
  { get; set; }
```

EDeepLearningBenchmarkSettings.CameraSpeed

Camera speed to simulate. If equal to 0, the benchmark will produce images as fast as possible.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float CameraSpeed
  { get; set; }
```

Remarks

Camera speed higher than 500 frame per seconds will lead to unreliable results.

EDeepLearningBenchmarkSettings.Device

Device to use for the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice Device
  { get; set; }
```

EDeepLearningBenchmarkSettings.EDeepLearningBenchmarkSettings

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EDeepLearningBenchmarkSettings(
 )
void EDeepLearningBenchmarkSettings(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmarkSettings other
 )
```

Parameters

other

-

EDeepLearningBenchmarkSettings.Engine

Deep Learning engine to use for the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Engine
  { get; set; }
```

EDeepLearningBenchmarkSettings.InferencePrecision

Inference precision to use for the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningInferencePrecision
InferencePrecision
  { get; set; }
```

EDeepLearningBenchmarkSettings.InternalResizeDisabled

Whether to disable the internal resize operation performed by the Deep Learning tools. When disabled, the benchmark will generate images at the optimal size for the tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool InternalResizeDisabled
  { get; set; }
```

EDeepLearningBenchmarkSettings.Load

Loads a EDeepLearningBenchmarkSettings object. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string filePath
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for reading.

EDeepLearningBenchmarkSettings.Name

Name of the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Name
  { get; set; }
```

EDeepLearningBenchmarkSettings.NumExternalThreads

Number of external threads.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumExternalThreads
  { get; set; }
```

EDeepLearningBenchmarkSettings.NumImages

Number of images to use during the benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumImages
  { get; set; }
```

EDeepLearningBenchmarkSettings.NumInternalThreads

Number of internal threads.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumInternalThreads
  { get; set; }
```

EDeepLearningBenchmarkSettings.operator=

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmarkSettings operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmarkSettings other
 )
```

Parameters

other

-

EDeepLearningBenchmarkSettings.Save

Saves the EDeepLearningBenchmarkSettings object. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string filePath
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for writing.

4.75. EDeepLearningDefectDetectionMetrics Class

Collection of metrics used to evaluate a defect detection problem where the detection is based on the thresholding of a score produced by the underlying deep learning tool, e.g. a EUnsupervisedSegmenter tool or a ESupervisedSegmenter tool.
These metrics are only valid when results for good and defective images are included in the metrics (see EDeepLearningDefectDetectionMetrics::IsDefectDetectionMetricsValid). The definition of what is considered a good or a defective image depends on the deep learning tool used.
The defect detection metrics are separated in two main categories:
- Metrics dependent on the ROC (Receiver Operating Characteristic) curve. They require at least one good and one defective sample to be defined.
- Metrics dependent on the Precision/Recall curve. They require at least one defective sample to be defined.

The metrics related to the ROC curve are:
- The accuracy (see EDeepLearningDefectDetectionMetrics::GetAccuracy).
- The confusion matrix (see EDeepLearningDefectDetectionMetrics::GetConfusion and EConfusionMatrixElement)
- The ROC curve (see EDeepLearningDefectDetectionMetrics::GetROCPoint)
- The area Under ROC curve (see EDeepLearningDefectDetectionMetrics::AreaUnderROCCurve)

The metrics related to the precision/recall curve are:
- The average precision (see EDeepLearningDefectDetectionMetrics::AveragePrecision)
- Precision/Recall curve (see EDeepLearningDefectDetectionMetrics::GetPrecisionRecallCurvePoint)
- Precision (see EDeepLearningDefectDetectionMetrics::GetPrecision)
- Recall (see EDeepLearningDefectDetectionMetrics::GetRecall)
- F-Score (see EDeepLearningDefectDetectionMetrics::GetFScore).

The ROC and Precision/Recall curve are both obtained by computing some metrics for different values of the EDeepLearningDefectDetectionMetrics::ClassificationThreshold. Thus, each point on the curves gives different metrics, except for the area under the ROC curve and the average precision.
By default, the value of the metrics corresponds to the classification threshold of the corresponding deep learning tool. However, you can specify an index to retrieve the value of the metrics for other value of the EDeepLearningDefectDetectionMetrics::ClassificationThreshold. Metrics based on the ROC curve are indexed between 0 and EDeepLearningDefectDetectionMetrics::NumberOfClassifiers-1 and metrics based on the Precision/Recall curve are indexed between 0 and EDeepLearningDefectDetectionMetrics::NumPrecisionRecallCurvePoint-1.

Derived Class(es):ESupervisedSegmenterMetricsEUnsupervisedSegmenterMetrics

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AreaUnderROCCurve	The area under ROC curve (AUC) of the classifier (see EDeepLearningDefectDetectionMetrics::GetROCPoint). It's value is between 0 and 1. In the context of unsupervised segmentation, the AUC is equal to the probability that good images will have a lower reconstruction error than defective images. This metrics measure discrimination capacity of a model. It tells how much the model is capable of distinguishing between classes. The higher the AUC, the better the model is.
AveragePrecision	Average precision. The average precision is the area under the precision-recall curve. The presicion is the ratio between the number of true positive and the number of predicted possitive and the recall, also called the true positive rate, is the ratio between the number of true positive and the number of positive sample.
BestAccuracy	Best achievable accuracy. The classification threshold corresponding to this accuracy is given by EDeepLearningDefectDetectionMetrics::BestAccuracyClassificationThreshold.
BestAccuracyClassificationThreshold	Classification threshold giving the best achievable accuracy (see EDeepLearningDefectDetectionMetrics::BestAccuracy).
BestBalancedAccuracy	Best achievable balanced accuracy. The classification threshold corresponding to this accuracy is given by EDeepLearningDefectDetectionMetrics::BestBalancedAccuracyClassificationThreshold.
BestBalancedAccuracyClassificationThreshold	Classification threshold giving the best achievable balanced accuracy (see EDeepLearningDefectDetectionMetrics::BestBalancedAccuracy).
BestFScore	Best F1-Score. The F1-Score is the harmonic mean of the precision and recall (true positive rate).
BestFScoreThreshold	Classification threshold that yields the best F1-Score. The F1-Score is the harmonic mean of the precision and recall (true positive rate).
ClassificationThreshold	Classification threshold. By default, the classification threshold will be equal to the classification threshold of the last unsupervised segmenter used to produce the results that compose this metric. Some metrics such as EDeepLearningDefectDetectionMetrics::GetROCPoint, EDeepLearningDefectDetectionMetrics::GetAccuracy or EDeepLearningDefectDetectionMetrics depends on the classification threshold. By default, these methods will returns the metric corresponding to the classification threshold.

NumberOfClassifiers	Number of different possible classifiers. Each classifier is obtained by choosing a different classification threshold (see EUnsupervisedSegmenter::ClassificationThreshold and corresponds to a point in the ROC curve (see EDeepLearningDefectDetectionMetrics::GetROCPoint).
NumDefectiveSample	Number of defective sample added to the metric.
NumGoodSample	Number of good sample added to the metric.
NumPrecisionRecallCurvePoint	Number of point in the precision/recall curve.
PrecisionRecallCurveIndex	Index in the precision/recall curve for the current EDeepLearningDefectDetectionMetrics::ClassificationThreshold. The value of the index is between 0 and EDeepLearningDefectDetectionMetrics::NumPrecisionRecallCurvePoint - 1. The index is -1 if the precision/recall curve is not defined.

Methods

EDeepLearningDefectDetectionMetrics	Constructs an empty EDeepLearningDefectDetectionMetrics object.
GetAccuracy	The accuracy of the segmenter. The accuracy is the number of images that were correctly classified over the total number of images that was used to evaluate the classifier.
GetBestWeightedAccuracy	Best achievable weighted accuracy. The weighted accuracy is the weighted average of the true positive rate and the true negative rate (which is equal to 1 minus the false positive rate). See EROCPoint. The classification threshold corresponding to this accuracy is given by EDeepLearningDefectDetectionMetrics::GetBestWeightedAccuracyClassificationThreshold.
GetBestWeightedAccuracyClassificationThreshold	Classification threshold giving the best achievable weighted accuracy (see EDeepLearningDefectDetectionMetrics::GetBestWeightedAccuracy).
GetConfusion	Confusion value of one label with another. The confusion value of a label with another is the number of images belonging to this label that are classified as belonging to the other label. For a EDeepLearningDefectDetectionMetrics there are only 2 labels (good and defective) so the confusion matrix is only composed of 4 values which are called matrix element (see EDeepLearningDefectDetectionMetrics). The confusion matrix is computed for a given threshold (see EUnsupervisedSegmenter::ClassificationThreshold) which means an index can be passed to the method (see EDeepLearningDefectDetectionMetrics::NumberOfClassifiers).

GetFScore	The F1-Score for the current threshold. The F1-Score is the harmonic mean of EDeepLearningDefectDetectionMetrics and EDeepLearningDefectDetectionMetrics.
GetPrecision	Precision for the current threshold. The precision is the proportion of detected defective instances that were correctly identified as such.
GetPrecisionRecallCurvePoint	Get a point on the precision/recall curve.
GetRecall	Recall for the current threshold. It is the proportion of defective instances that were correctly identified as such. It is also called the true positive rate.
GetROCPoint	ROC (Receiver Operating Characteristic) point. A ROC point is a point from the ROC curve which is the plot of the true positive rate against the false positive rate (see EConfusionMatrixElement) obtained at various classification threshold (see EUnsupervisedSegmenter::ClassificationThreshold). The ROC points are stricly ordered by decreasing threshold order meaning the true positive rate and false positive rate (see EConfusionMatrixElement) are sorted in increasing order.
IsDefectDetectionMetricsValid	Whether the defect detection metrics are valid or not. Defect detection metrics are completely valid when the metrics has results for at least one good and one defective images. Some metrics might be valid with only defective or good results.
Load	Loads the defect detection metrics. The given ESerializer must have been created for reading.
operator=	Copy operator.
Save	Saves the defect detection metrics. The given ESerializer must have been created for writing.

EDeepLearningDefectDetectionMetrics.AreaUnderROCCurve

The area under ROC curve (AUC) of the classifier (see EDeepLearningDefectDetectionMetrics::GetROCPoint). It's value is between 0 and 1.
In the context of unsupervised segmentation, the AUC is equal to the probability that good images will have a lower reconstruction error than defective images.
This metrics measure discrimination capacity of a model.
It tells how much the model is capable of distinguishing between classes. The higher the AUC, the better the model is.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AreaUnderROCCurve
  { get; }
```

EDeepLearningDefectDetectionMetrics.AveragePrecision

Average precision.
The average precision is the area under the precision-recall curve. The presicion is the ratio between the number of true positive and the number of predicted possitive and the recall, also called the true positive rate, is the ratio between the number of true positive and the number of positive sample.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AveragePrecision
  { get; }
```

EDeepLearningDefectDetectionMetrics.BestAccuracy

Best achievable accuracy.
The classification threshold corresponding to this accuracy is given by EDeepLearningDefectDetectionMetrics::BestAccuracyClassificationThreshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestAccuracy
  { get; }
```

EDeepLearningDefectDetectionMetrics.BestAccuracyClassificationThreshold

Classification threshold giving the best achievable accuracy (see EDeepLearningDefectDetectionMetrics::BestAccuracy).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestAccuracyClassificationThreshold
  { get; }
```

EDeepLearningDefectDetectionMetrics.BestBalancedAccuracy

Best achievable balanced accuracy.
The classification threshold corresponding to this accuracy is given by EDeepLearningDefectDetectionMetrics::BestBalancedAccuracyClassificationThreshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestBalancedAccuracy
  { get; }
```

EDeepLearningDefectDetectionMetrics.BestBalancedAccuracyClassificationThreshold

Classification threshold giving the best achievable balanced accuracy (see EDeepLearningDefectDetectionMetrics::BestBalancedAccuracy).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestBalancedAccuracyClassificationThreshold
  { get; }
```

EDeepLearningDefectDetectionMetrics.BestFScore

Best F1-Score.
The F1-Score is the harmonic mean of the precision and recall (true positive rate).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestFScore
  { get; }
```

EDeepLearningDefectDetectionMetrics.BestFScoreThreshold

Classification threshold that yields the best F1-Score.
The F1-Score is the harmonic mean of the precision and recall (true positive rate).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BestFScoreThreshold
  { get; }
```

EDeepLearningDefectDetectionMetrics.ClassificationThreshold

Classification threshold.
By default, the classification threshold will be equal to the classification threshold of the last unsupervised segmenter used to produce the results that compose this metric.
Some metrics such as EDeepLearningDefectDetectionMetrics::GetROCPoint, EDeepLearningDefectDetectionMetrics::GetAccuracy or EDeepLearningDefectDetectionMetrics depends on the classification threshold. By default, these methods will returns the metric corresponding to the classification threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float ClassificationThreshold
  { get; set; }
```

Remarks

Modifying the classification threshold in this class doesn't modify the classification threshold of the unsupervised segmenter.

EDeepLearningDefectDetectionMetrics.EDeepLearningDefectDetectionMetrics

Constructs an empty EDeepLearningDefectDetectionMetrics object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void EDeepLearningDefectDetectionMetrics(
 )
void EDeepLearningDefectDetectionMetrics(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDefectDetectionMetrics other
 )
```

Parameters

other

Other object

EDeepLearningDefectDetectionMetrics.GetAccuracy

The accuracy of the segmenter.
The accuracy is the number of images that were correctly classified over the total number of images that was used to evaluate the classifier.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetAccuracy(
 int index
 )
```

Parameters

index

The index of the classifier to use. If the index is equal to '-1', the index corresponding to EUnsupervisedSegmenter::ClassificationThreshold will be used.

EDeepLearningDefectDetectionMetrics.GetBestWeightedAccuracy

Best achievable weighted accuracy.
The weighted accuracy is the weighted average of the true positive rate and the true negative rate (which is equal to 1 minus the false positive rate). See EROCPoint.
The classification threshold corresponding to this accuracy is given by EDeepLearningDefectDetectionMetrics::GetBestWeightedAccuracyClassificationThreshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetBestWeightedAccuracy(
 float goodWeight,
 float badWeight
 )
```

Parameters

goodWeight

Weight for the good label

badWeight

Weight for the bad label

Remarks

When using a dataset as the source for the label weights, the good weight is the weight of the "good" label and the bad weight is the sum of the weights of all the other labels.

EDeepLearningDefectDetectionMetrics.GetBestWeightedAccuracyClassificationThreshold

Classification threshold giving the best achievable weighted accuracy (see EDeepLearningDefectDetectionMetrics::GetBestWeightedAccuracy).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetBestWeightedAccuracyClassificationThreshold(
 float goodWeight,
 float badWeight
 )
```

Parameters

goodWeight

Weight for the good label

badWeight

Weight for the bad label

EDeepLearningDefectDetectionMetrics.GetConfusion

Confusion value of one label with another.
The confusion value of a label with another is the number of images belonging to this label that are classified as belonging to the other label.
For a EDeepLearningDefectDetectionMetrics there are only 2 labels (good and defective) so the confusion matrix is only composed of 4 values which are called matrix element (see EDeepLearningDefectDetectionMetrics).
The confusion matrix is computed for a given threshold (see EUnsupervisedSegmenter::ClassificationThreshold) which means an index can be passed to the method (see EDeepLearningDefectDetectionMetrics::NumberOfClassifiers).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint GetConfusion(
 Euresys.Open_eVision.EasyDeepLearning.EConfusionMatrixElement element,
 int index
 )
```

Parameters

element

The element from which to obtain the confusion value

index

The index of the classifier to use. If the index is '-1', the index corresponding to EUnsupervisedSegmenter::ClassificationThreshold will be used.

EDeepLearningDefectDetectionMetrics.GetFScore

The F1-Score for the current threshold.
The F1-Score is the harmonic mean of EDeepLearningDefectDetectionMetrics and EDeepLearningDefectDetectionMetrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetFScore(
 int index
 )
```

Parameters

index

Index for the precision/recall curve point or -1 to use the index corresponding to the current EDeepLearningDefectDetectionMetrics::ClassificationThreshold.

EDeepLearningDefectDetectionMetrics.GetPrecision

Precision for the current threshold.
The precision is the proportion of detected defective instances that were correctly identified as such.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetPrecision(
 int index
 )
```

Parameters

index

Index for the precision/recall curve point or -1 to use the index corresponding to the current EDeepLearningDefectDetectionMetrics::ClassificationThreshold.

EDeepLearningDefectDetectionMetrics.GetPrecisionRecallCurvePoint

Get a point on the precision/recall curve.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EROCPoint GetPrecisionRecallCurvePoint(
 int index
 )
```

Parameters

index

Index for the precision/recall curve point or -1 to use the index corresponding to the current EDeepLearningDefectDetectionMetrics::ClassificationThreshold.

Remarks

The precision/recall curve is defined when there is at least one ground truth positive sample in the metric.

EDeepLearningDefectDetectionMetrics.GetRecall

Recall for the current threshold.
It is the proportion of defective instances that were correctly identified as such. It is also called the true positive rate.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetRecall(
 int index
 )
```

Parameters

index

Index for the precision/recall curve point or -1 to use the index corresponding to the current EDeepLearningDefectDetectionMetrics::ClassificationThreshold.

EDeepLearningDefectDetectionMetrics.GetROCPoint

ROC (Receiver Operating Characteristic) point.
A ROC point is a point from the ROC curve which is the plot of the true positive rate against the false positive rate (see EConfusionMatrixElement) obtained at various classification threshold (see EUnsupervisedSegmenter::ClassificationThreshold).
The ROC points are stricly ordered by decreasing threshold order meaning the true positive rate and false positive rate (see EConfusionMatrixElement) are sorted in increasing order.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EROCPoint GetROCPoint(
 int index
 )
```

Parameters

index

The index of the classifier to use. If the index is equal to '-1', the index corresponding to EUnsupervisedSegmenter::ClassificationThreshold will be used.

Remarks

Each ROC point corresponds to a different classifier (see EDeepLearningDefectDetectionMetrics::NumberOfClassifiers).
It means that the ROC curve is the perfect tool to choose a threshold depending on the false and true positive rate values that best suit your application.

EDeepLearningDefectDetectionMetrics.IsDefectDetectionMetricsValid

Whether the defect detection metrics are valid or not. Defect detection metrics are completely valid when the metrics has results for at least one good and one defective images. Some metrics might be valid with only defective or good results.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsDefectDetectionMetricsValid(
 )
```

EDeepLearningDefectDetectionMetrics.Load

Loads the defect detection metrics. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EDeepLearningDefectDetectionMetrics.NumberOfClassifiers

Number of different possible classifiers.
Each classifier is obtained by choosing a different classification threshold (see EUnsupervisedSegmenter::ClassificationThreshold and corresponds to a point in the ROC curve (see EDeepLearningDefectDetectionMetrics::GetROCPoint).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumberOfClassifiers
  { get; }
```

Remarks

The number of classifiers is equal to 2 plus the number of results added to the metrics that have a unique classification score (i.e. different from the classification score of all the other results): each unique classification score corresponds to a classification threshold.

EDeepLearningDefectDetectionMetrics.NumDefectiveSample

Number of defective sample added to the metric.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumDefectiveSample
  { get; }
```

EDeepLearningDefectDetectionMetrics.NumGoodSample

Number of good sample added to the metric.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumGoodSample
  { get; }
```

EDeepLearningDefectDetectionMetrics.NumPrecisionRecallCurvePoint

Number of point in the precision/recall curve.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumPrecisionRecallCurvePoint
  { get; }
```

Remarks

The precision/recall curve is defined when there is at least one ground truth positive sample in the metric. The number of point in the precision/recall curve is equal to the number of positive sample plus 1.

EDeepLearningDefectDetectionMetrics.operator=

Copy operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDefectDetectionMetrics operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDefectDetectionMetrics other
 )
```

Parameters

other

Other object

EDeepLearningDefectDetectionMetrics.PrecisionRecallCurveIndex

Index in the precision/recall curve for the current EDeepLearningDefectDetectionMetrics::ClassificationThreshold.
The value of the index is between 0 and EDeepLearningDefectDetectionMetrics::NumPrecisionRecallCurvePoint - 1. The index is -1 if the precision/recall curve is not defined.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int PrecisionRecallCurveIndex
  { get; }
```

EDeepLearningDefectDetectionMetrics.Save

Saves the defect detection metrics. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.76. EDeepLearningDevice Class

Class representing a device that can run a neural network. A device is fully described by its EDeepLearningDevice::Name and EDeepLearningDevice::EngineName.
The other properties are information about the device and its capabilities.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

DefaultPrecision	Default precision for this device. If supported by the device, the default precision will be FLOAT32.
DeviceId	A device index corresponding to the index of the device within the engine. With the default engine, the device index is the index of the NVIDIA GPU for example.
DeviceType	The device type.
DeviceTypeDescription	Textual description of the device type.
EngineName	The name of the engine supporting this device.
FullName	A full name of the device.
Name	Name of the device.
SupportedPrecisions	Precisions supported by the device.

Methods

EDeepLearningDevice	Default constructor. The resulting device will be invalid.
HasInferenceCapability	Whether the device can perform inference or not.
HasTrainingCapability	Whether the device can perform training or not.
IsPrecisionSupported	Whether the given precision is supported by the device or not.
IsValid	Whether this instance represents a usable device or not.
operator!=	Inequality operator.
operator=	Copy operator
operator==	Equality operator.

EDeepLearningDevice.DefaultPrecision

Default precision for this device. If supported by the device, the default precision will be FLOAT32.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningInferencePrecision DefaultPrecision
  { get; }
```

EDeepLearningDevice.DeviceId

A device index corresponding to the index of the device within the engine.
With the default engine, the device index is the index of the NVIDIA GPU for example.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int DeviceId
  { get; }
```

EDeepLearningDevice.DeviceType

The device type.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDeviceType DeviceType
  { get; }
```

EDeepLearningDevice.DeviceTypeDescription

Textual description of the device type.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string DeviceTypeDescription
  { get; }
```

EDeepLearningDevice.EDeepLearningDevice

Default constructor. The resulting device will be invalid.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EDeepLearningDevice(
 )
void EDeepLearningDevice(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice other
 )
```

Parameters

other

Device to copy

EDeepLearningDevice.EngineName

The name of the engine supporting this device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string EngineName
  { get; }
```

EDeepLearningDevice.FullName

A full name of the device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string FullName
  { get; }
```

EDeepLearningDevice.HasInferenceCapability

Whether the device can perform inference or not.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasInferenceCapability(
 )
```

EDeepLearningDevice.HasTrainingCapability

Whether the device can perform training or not.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasTrainingCapability(
 )
```

EDeepLearningDevice.IsPrecisionSupported

Whether the given precision is supported by the device or not.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsPrecisionSupported(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningInferencePrecision precision
 )
```

Parameters

precision

Precision to check

EDeepLearningDevice.IsValid

Whether this instance represents a usable device or not.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

EDeepLearningDevice.Name

Name of the device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Name
  { get; }
```

EDeepLearningDevice.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice other
 )
```

Parameters

other

Device to compare with

EDeepLearningDevice.operator=

Copy operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice other
 )
```

Parameters

other

Device to copy

EDeepLearningDevice.operator==

Equality operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool operator==(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice other
 )
```

Parameters

other

Device to compare with

EDeepLearningDevice.SupportedPrecisions

Precisions supported by the device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningInferencePrecision[]
SupportedPrecisions
  { get; }
```

4.77. EDeepLearningExecutionSettings Class

Execution settings for a Deep Learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AvailableDevices	Get all available device for the current engine.
AvailableEngines	Available engines.
BatchSize	Batch size. The batch size is the number of images that are processed together during training and batch inference. When using multi-GPUs processing (see EDeepLearningExecutionSettings), the batch size is the number of images that each GPU will process at once. A large batch size will increase the processing speed on GPU but also the memory requirements. The batch size must be bigger or equal to 1 and it is commonly chosen to be a power of 2.
DeviceById	Sets the device with which to run the model using its index in the list returned by EDeepLearningExecutionSettings::AvailableDevices.
DeviceByName	Sets the device with which to run the model using its name.
Devices	Devices with which to run or train the model. Using multiple GPUs is only supported by the default engine.
Engine	Engine with which to execute or train the neural network.
InferencePrecision	Inference precision. Use EDeepLearningDevice::IsPrecisionSupported to check whether a device support the given precision.
NumAvailableDevices	Available devices for the current EDeepLearningExecutionSettings::Engine.
NumAvailableEngines	Number of available engines.
NumDevices	Number of devices configured in this execution context.

OptimizeBatchSize	Indicates whether to optimize the batch size (see EDeepLearningExecutionSettings::BatchSize) to maximize the training and inference speed according to the engine, device and the available memory. Default value is true.

Methods

CopyTo	Copy the object to another one.
EDeepLearningExecutionSettings	Constructs a EDeepLearningExecutionSettings.
GetAvailableDevice	-
GetAvailableDeviceName	Name of the i-th device of the current engine.
GetAvailableDevicesForEngine	Available devices for the specified engine.
GetAvailableEngineName	Gets the name of the engine given its id.
GetDevice	Gets an active device. By default, it returns the first active device.
Load	Loads the EDeepLearningExecutionSettings. The given ESerializer must have been created for reading.
operator=	Assignement operator.
Save	Saves the EDeepLearningExecutionSettings. The given ESerializer must have been created for writing.
SetDevice	Sets the device with which to run or train the model.

EDeepLearningExecutionSettings.AvailableDevices

Get all available device for the current engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice[] AvailableDevices
  { get; }
```

EDeepLearningExecutionSettings.AvailableEngines

Available engines.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
static string[] AvailableEngines
  { get; }
```

EDeepLearningExecutionSettings.BatchSize

Batch size. The batch size is the number of images that are processed together during training and batch inference.
When using multi-GPUs processing (see EDeepLearningExecutionSettings), the batch size is the number of images that each GPU will process at once.
A large batch size will increase the processing speed on GPU but also the memory requirements.
The batch size must be bigger or equal to 1 and it is commonly chosen to be a power of 2.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BatchSize
  { get; set; }
```

Remarks

If EDeepLearningExecutionSettings::OptimizeBatchSize is 'true', then the value of this property will not be taken into account because it will be optimized automatically for training or inference according to the situation.

EDeepLearningExecutionSettings.CopyTo

Copy the object to another one.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningExecutionSettings other
 )
```

Parameters

other

-

EDeepLearningExecutionSettings.DeviceById

Sets the device with which to run the model using its index in the list returned by EDeepLearningExecutionSettings::AvailableDevices.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int DeviceById
  { get; set; }
```

EDeepLearningExecutionSettings.DeviceByName

Sets the device with which to run the model using its name.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string DeviceByName
  { get; set; }
```

EDeepLearningExecutionSettings.Devices

Devices with which to run or train the model.
Using multiple GPUs is only supported by the default engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice[] Devices
  { get; set; }
```

EDeepLearningExecutionSettings.EDeepLearningExecutionSettings

Constructs a EDeepLearningExecutionSettings.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EDeepLearningExecutionSettings(
 )
void EDeepLearningExecutionSettings(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningExecutionSettings other
 )
```

Parameters

other

-

EDeepLearningExecutionSettings.Engine

Engine with which to execute or train the neural network.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Engine
  { get; set; }
```

EDeepLearningExecutionSettings.GetAvailableDevice

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice GetAvailableDevice(
 int i
 )
```

Parameters

i

-

EDeepLearningExecutionSettings.GetAvailableDeviceName

Name of the i-th device of the current engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetAvailableDeviceName(
 int i
 )
```

Parameters

i

Index of the device between 0 and EDeepLearningExecutionSettings - 1.

EDeepLearningExecutionSettings.GetAvailableDevicesForEngine

Available devices for the specified engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice[]
GetAvailableDevicesForEngine(
 string engine
 )
```

Parameters

engine

Engine for which to get the devices

EDeepLearningExecutionSettings.GetAvailableEngineName

Gets the name of the engine given its id.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetAvailableEngineName(
 int id
 )
```

Parameters

id

Index of the available engine between 0 and EDeepLearningExecutionSettings::NumAvailableEngines - 1.

EDeepLearningExecutionSettings.GetDevice

Gets an active device. By default, it returns the first active device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice GetDevice(
 int i
 )
```

Parameters

i

Index of the active devices between 0 and EDeepLearningExecutionSettings.

EDeepLearningExecutionSettings.InferencePrecision

Inference precision.
Use EDeepLearningDevice::IsPrecisionSupported to check whether a device support the given precision.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningInferencePrecision
InferencePrecision
  { get; set; }
```

EDeepLearningExecutionSettings.Load

Loads the EDeepLearningExecutionSettings. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string filePath
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for reading.

Remarks

Loading a EDeepLearningExecutionSettings can trigger exceptions if the engine and/or device is not available on the machine.

EDeepLearningExecutionSettings.NumAvailableDevices

Available devices for the current EDeepLearningExecutionSettings::Engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumAvailableDevices
```

```
{ get; }
```

EDeepLearningExecutionSettings.NumAvailableEngines

Number of available engines.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
static int NumAvailableEngines
  { get; }
```

EDeepLearningExecutionSettings.NumDevices

Number of devices configured in this execution context.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumDevices
  { get; }
```

EDeepLearningExecutionSettings.operator=

Assignement operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningExecutionSettings operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningExecutionSettings other
 )
```

Parameters

other

-

EDeepLearningExecutionSettings.OptimizeBatchSize

Indicates whether to optimize the batch size (see EDeepLearningExecutionSettings::BatchSize) to maximize the training and inference speed according to the engine, device and the available memory.
Default value is true.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool OptimizeBatchSize
  { get; set; }
```

EDeepLearningExecutionSettings.Save

Saves the EDeepLearningExecutionSettings. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string filePath
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for writing.

EDeepLearningExecutionSettings.SetDevice

Sets the device with which to run or train the model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetDevice(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice device
 )
```

Parameters

device

-

Remarks

For CPU device, the number of thread is initialized from Easy

4.78. EDeepLearningProject Class

Deep learning project.
A deep learning project manages a directory (EDeepLearningProject::ProjectDirectory) in which it stores:
- A main project file (EDeepLearningProject::ProjectFile) containing the dataset, the dataset splits, data augmentation objects, and meta data about the tools;
- A image directory to store the images of the dataset (EDeepLearningProject::ImageDirectory);
- A directory for each tool named after the corresponding tool name (EDeepLearningProject::GetToolName).

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

CreationDate	Creation date of the project represented as the number of seconds since the UNIX epoch.
Dataset	Gets the dataset contained in the project.
FileStructureUpdateDescription	Description of the file structure update.
GoodLabel	Good label for EasySegment Unsupervised.
ImageDirectory	Image directory. Calling this method will create the image directory if it doesn't exist.
ImportImageIntoProjectDirectory	Whether to import the images into the EDeepLearningProject::ImageDirectory. (Default value: true)
ISOCreationDate	Creation date of the project as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).
Name	Name of the project.
NumDataAugmentations	Number of data augmentation.
NumSplits	Number of dataset splits in the project.
NumTools	Number of tools.
ProjectDirectory	Project directory. The project directory can only be set on an empty project. Setting the project directory will create the directory if it doesn't exist.
ProjectFile	Path to the project file. The path to the project file is only defined for a project that has non-empty EDeepLearningProject::Name and EDeepLearningProject::ProjectDirectory.
Type	Type of the tools in the projects.

Methods

AddBenchmark	Adds a benchmark for the given tool.
AddDataAugmentation	Adds an empty data augmentation.
AddSplit	Adds a split.
AddTool	Adds a new tool with the given name.
CopyTo	Copy the project.
EDeepLearningProject	Creates or opens a project.
GetBenchmark	Gets a benchmark for a given tool.
GetDataAugmentation	Gets the data augmentation object for the given index.
GetDataAugmentationCreationDate	Creation date of the data augmentation represented as the number of seconds since the UNIX epoch.
GetDataAugmentationCreationISODate	Creation date of the data augmentation formatted as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).
GetDataAugmentationName	Name of the data augmentation.
GetNumBenchmarks	Number of benchmarks for the given tool.
GetResultFilename	Result filename for the given image.
GetSplit	Gets the dataset split object for the given index.
GetSplitCreationDate	Creation date of the split represented as the number of seconds since the UNIX epoch.
GetSplitCreationISODate	Creation date of the split formatted as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).
GetSplitName	Name of the split.
GetToolCopy	Loads and returns the i-th tool of the project. The user is responsible for deleting the returned object.
GetToolCreationDate	Creation date of the tool represented as the number of seconds since the UNIX epoch.
GetToolDataAugmentation	Data augmentation associated with a tool.
GetToolISOCreationDate	Creation date of the tool represented as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).
GetToolName	Tool name.
GetToolSplit	Dataset split associated with a tool.
HasFileStructureUpdates	Whether the project can be updated to a new folder and file structure.

ImportTool	Imports an existing tool. Note that the imported tool will be copied into the project directory. The original file will no be used by the project. The labels' name, weight, and color in the imported tool will be taken from the dataset.
IsToolNameValid	Checks that the tool name is valid (not used by any other tool).
Load	Loads a project.
operator=	Assignment operator.
RemoveBenchmark	Removes a benchmark.
RemoveDataAugmentation	Removes the given data augmentation. The data augmentation at index 0 can't be removed.
RemoveSplit	Removes a split.
RemoveTool	Removes the given tool from the project. This will also remove all files and directories associated with the tool (tool directory, result and metrics files).
Save	Saves a project and set the project directory to the parent directory of projectFile.
SaveProject	Saves an opened project.
SetBenchmark	Replaces a benchmark.
SetDataAugmentationName	Name of the data augmentation.
SetSplitName	Name of the split.
SetToolDataAugmentation	Data augmentation associated with a tool.
SetToolName	Tool name. Changing the name of a tool will move the directory in which the tool is saved.
SetToolSplit	Dataset split associated with a tool.
UnsetGoodLabel	Remove the good label for EasySegment Unsupervised.
UpdateProjectFileStructure	Updates the project file structure.

EDeepLearningProject.AddBenchmark

Adds a benchmark for the given tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddBenchmark(
 int toolId,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark benchmark
 )
```

Parameters

toolId
Index of the tool

benchmark
Benchmark to add to the project

EDeepLearningProject.AddDataAugmentation

Adds an empty data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddDataAugmentation(
 string name
 )
void AddDataAugmentation(
 string name,
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation dataAugmentation
 )
```

Parameters

name
Name for the data augmentation

dataAugmentation
Instance of EDataAugmentation class

EDeepLearningProject.AddSplit

Adds a split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddSplit(
 string name,
 Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit split
 )
```

Parameters

name
Name of the split

split
Instance of EDatasetSplit class.

EDeepLearningProject.AddTool

Adds a new tool with the given name.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void AddTool(
 string name
 )
```

Parameters

name

Name of the tool.

EDeepLearningProject.CopyTo

Copy the project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningProject other
 )
```

Parameters

other

Other project

EDeepLearningProject.CreationDate

Creation date of the project represented as the number of seconds since the UNIX epoch.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
System.Int64 CreationDate
  { get; }
```

EDeepLearningProject.Dataset

Gets the dataset contained in the project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset Dataset
  { get; }
```

EDeepLearningProject.EDeepLearningProject

Creates or opens a project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void EDeepLearningProject(
 string projectFile
 )
void EDeepLearningProject(
 string projectDir,
 string projectName,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType type
 )
void EDeepLearningProject(
 )
void EDeepLearningProject(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningProject other
 )
```

Parameters

projectFile
: Main project file top open

projectDir
: Directory for a new project

projectName
: Name of the new project project

type
: Type of the new project

other
: Other project for the copy constructor

EDeepLearningProject.FileStructureUpdateDescription

Description of the file structure update.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string FileStructureUpdateDescription
  { get; }
```

EDeepLearningProject.GetBenchmark

Gets a benchmark for a given tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark GetBenchmark(
 int toolId,
 int benchId
 )
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark GetBenchmark(
 int toolId,
 int benchId
 )
```

Parameters

toolId

Index of the tool

benchId

Index of the benchmark

EDeepLearningProject.GetDataAugmentation

Gets the data augmentation object for the given index.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation GetDataAugmentation(
 int dataAugmentationId
 )
```

Parameters

dataAugmentationId

Index of the data augmentation

EDeepLearningProject.GetDataAugmentationCreationDate

Creation date of the data augmentation represented as the number of seconds since the UNIX epoch.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.Int64 GetDataAugmentationCreationDate(
 int dataAugmentationId
 )
```

Parameters

dataAugmentationId

Index of the data augmentation

EDeepLearningProject.GetDataAugmentationCreationISODate

Creation date of the data augmentation formatted as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetDataAugmentationCreationISODate(
 int dataAugmentationId
 )
```

Parameters

dataAugmentationId

Index of the data augmentation

EDeepLearningProject.GetDataAugmentationName

Name of the data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetDataAugmentationName(
 int dataAugmentationId
 )
```

Parameters

dataAugmentationId

Index of the data augmentation

EDeepLearningProject.GetNumBenchmarks

Number of benchmarks for the given tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumBenchmarks(
 int toolId
 )
```

Parameters

toolId

Index of the tool

EDeepLearningProject.GetResultFilename

Result filename for the given image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetResultFilename(
 int imageId
 )
```

Parameters

imageId

Index of the image in the dataset

EDeepLearningProject.GetSplit

Gets the dataset split object for the given index.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDatasetSplit GetSplit(
 int splitId
 )
```

Parameters

splitId

Index of the split

EDeepLearningProject.GetSplitCreationDate

Creation date of the split represented as the number of seconds since the UNIX epoch.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
System.Int64 GetSplitCreationDate(
 int splitId
 )
```

Parameters

splitId

Index of the split

EDeepLearningProject.GetSplitCreationISODate

Creation date of the split formatted as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetSplitCreationISODate(
 int splitId
 )
```

Parameters

splitId

Index of the split

EDeepLearningProject.GetSplitName

Name of the split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetSplitName(
 int splitId
 )
```

Parameters

splitId

Index of the split

EDeepLearningProject.GetToolCopy

Loads and returns the i-th tool of the project.
The user is responsible for deleting the returned object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningTool GetToolCopy(
 int toolId,
 bool includeTrainingModel
 )
```

Parameters

toolId
Index of the tool

includeTrainingModel
Whether to include the training model

EDeepLearningProject.GetToolCreationDate

Creation date of the tool represented as the number of seconds since the UNIX epoch.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.Int64 GetToolCreationDate(
 int toolId
 )
```

Parameters

toolId
Index of the tool

EDeepLearningProject.GetToolDataAugmentation

Data augmentation associated with a tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetToolDataAugmentation(
 int toolId
 )
```

Parameters

toolId

Index of the tool

EDeepLearningProject.GetToolISOCreationDate

Creation date of the tool represented as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetToolISOCreationDate(
 int toolId
 )
```

Parameters

toolId

Index of the tool

EDeepLearningProject.GetToolName

Tool name.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetToolName(
 int toolId
 )
```

Parameters

toolId

Index of the tool

EDeepLearningProject.GetToolSplit

Dataset split associated with a tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetToolSplit(
 int toolId
 )
```

Parameters

toolId

Index of the tool

EDeepLearningProject.GoodLabel

Good label for EasySegment Unsupervised.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GoodLabel
  { get; set; }
```

EDeepLearningProject.HasFileStructureUpdates

Whether the project can be updated to a new folder and file structure.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasFileStructureUpdates(
 )
```

EDeepLearningProject.ImageDirectory

Image directory.
Calling this method will create the image directory if it doesn't exist.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string ImageDirectory
  { get; }
```

EDeepLearningProject.ImportImageIntoProjectDirectory

Whether to import the images into the EDeepLearningProject::ImageDirectory. (Default value: true)

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool ImportImageIntoProjectDirectory
```

```
{ get; set; }
```

Remarks

This is a hint for Deep Learning Studio and this property will not be enforced when adding images through the API.
Importing the images into the project directory allows relocating a project to another computer.

EDeepLearningProject.ImportTool

Imports an existing tool. Note that the imported tool will be copied into the project directory. The original file will no be used by the project.
The labels' name, weight, and color in the imported tool will be taken from the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ImportTool(
 string name,
 string path
 )
void ImportTool(
 string name,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningTool tool
 )
```

Parameters

name
Name for the imported tool.

path
Path towards the tool file.

tool
Tool object to import.

EDeepLearningProject.ISOCreationDate

Creation date of the project as an ISO 8601 date (YYYY-MM-DD HH:MM:SS).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string ISOCreationDate
  { get; }
```

EDeepLearningProject.IsToolNameValid

Checks that the tool name is valid (not used by any other tool).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsToolNameValid(
 string toolName
 )
```

Parameters

toolName

Tool name

EDeepLearningProject.Load

Loads a project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Load(
 string projectFile
 )
```

Parameters

projectFile

Project file to load

EDeepLearningProject.Name

Name of the project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string Name
  { get; set; }
```

EDeepLearningProject.NumDataAugmentations

Number of data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumDataAugmentations
  { get; }
```

Remarks

A project always contains an empty data augmentation at index 0.

EDeepLearningProject.NumSplits

Number of dataset splits in the project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumSplits
  { get; }
```

EDeepLearningProject.NumTools

Number of tools.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumTools
  { get; }
```

EDeepLearningProject.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningProject operator=(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningProject other
 )
```

Parameters

other

Other project

EDeepLearningProject.ProjectDirectory

Project directory.
The project directory can only be set on an empty project. Setting the project directory will create the directory if it doesn't exist.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string ProjectDirectory
  { get; set; }
```

EDeepLearningProject.ProjectFile

Path to the project file.
The path to the project file is only defined for a project that has non-empty EDeepLearningProject::Name and EDeepLearningProject::ProjectDirectory.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string ProjectFile
  { get; }
```

EDeepLearningProject.RemoveBenchmark

Removes a benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void RemoveBenchmark(
 int toolId,
 int benchmarkId
 )
```

Parameters

toolId
Index of the tool

benchmarkId
Index of the benchmark to remove

EDeepLearningProject.RemoveDataAugmentaton

Removes the given data augmentation. The data augmentation at index 0 can't be removed.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveDataAugmentaton(
 int dataAugmentationId
 )
```

Parameters

dataAugmentationId

Index of the data augmentation to remove

EDeepLearningProject.RemoveSplit

Removes a split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveSplit(
 int splitId
 )
```

Parameters

splitId

Index of the split

EDeepLearningProject.RemoveTool

Removes the given tool from the project. This will also remove all files and directories associated with the tool (tool directory, result and metrics files).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveTool(
 int toolId
 )
```

Parameters

toolId

Index of the tool to remove

EDeepLearningProject.Save

Saves a project and set the project directory to the parent directory of projectFile.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string projectFile
 )
```

Parameters

projectFile

Project file to save

EDeepLearningProject.SaveProject

Saves an opened project.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SaveProject(
 )
```

EDeepLearningProject.SetBenchmark

Replaces a benchmark.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetBenchmark(
 int toolId,
 int benchmarkId,
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningBenchmark benchmark
 )
```

Parameters

toolId

Index of the tool

benchmarkId

Index of the benchmark to replace

benchmark

New benchmark

EDeepLearningProject.SetDataAugmentationName

Name of the data augmentation.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetDataAugmentationName(
 int dataAugmentationId,
 string name
 )
```

Parameters

dataAugmentationId

Index of the data augmentation

name

New name for the data augmentation

EDeepLearningProject.SetSplitName

Name of the split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetSplitName(
 int splitId,
 string newName
 )
```

Parameters

splitId

Index of the split

newName

New name for the split

EDeepLearningProject.SetToolDataAugmentation

Data augmentation associated with a tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetToolDataAugmentation(
 int toolId,
 int dataAugmentationId
 )
```

Parameters

toolId
Index of the tool

dataAugmentationId
Index of the data augmentation

EDeepLearningProject.SetToolName

Tool name.
Changing the name of a tool will move the directory in which the tool is saved.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetToolName(
 int toolId,
 string name
 )
```

Parameters

toolId
Index of the tool

name
New name for the tool

EDeepLearningProject.SetToolSplit

Dataset split associated with a tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetToolSplit(
 int toolId,
 int splitId
 )
```

Parameters

toolId
Index of the tool

splitId
Index of the split

EDeepLearningProject.Type

Type of the tools in the projects.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType Type
  { get; set; }
```

EDeepLearningProject.UnsetGoodLabel

Remove the good label for EasySegment Unsupervised.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void UnsetGoodLabel(
 )
```

EDeepLearningProject.UpdateProjectFileStructure

Updates the project file structure.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void UpdateProjectFileStructure(
 )
```

4.79. EDeepLearningTool Class

EDeepLearningTool represents the common operations of deep learning tools.

The class is responsible for handling CPU/GPU settings and training.
Computing the result for an image is called inference and is the responsability of the actual deep learning tools (see EClassifier).

Derived Class(es): EClassifierELocatorBaseESupervisedSegmenterEUnsupervisedSegmenter

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

ActiveDeviceById	Sets the device with which to run the model using its index in the list returned by EDeepLearningTool::AvailableDevices.
ActiveDeviceByName	Sets the device with which to run the model using its name.
ActiveDevices	Devices with which to run or train the model. Only multiple GPUs with the default engine is supported.
ActiveDevicesById	Sets the devices with which to run the model using their index in the list returned by EDeepLearningTool::AvailableDevices.
AutoSavePeriod	Auto-save period. The auto-save period is the number of training iterations between each automatic save of the model. In order for the model to be automatically saved during the training, the tool must have been loaded or saved to a file. The path where the tool will be saved is either indicated by EDeepLearningTool::Path or the three paths EDeepLearningTool::SettingsPath, EDeepLearningTool::InferenceModelPath, and EDeepLearningTool::TrainingModelPath. If one of these path is empty, the corresponding part of the tool will not be saved automatically during training. By default, auto save is disabled and the period is equal to 0.
AvailableDevices	Get all available device for the current engine.
AvailableEngines	Available engines.
BatchSize	Batch size. The batch size is the number of images that are processed together during training and batch inference. When using multi-GPUs processing (see EDeepLearningTool::GPUIndexes), the batch size is the number of images that each GPU will process at once. A large batch size will increase the processing speed on GPU but also the memory requirements. The batch size must be bigger or equal to 1 and it is commonly chosen to be a power of 2.
BatchSizeForMaximumInferenceSpeed	Computes the batch size that will maximize the inference speed on NVIDIA GPU. For all other devices, it will return 1.
BestIteration	Iteration at which the minimum validation error was reached. After training, the tool is in the state it was at this best iteration.

CurrentTrainingFinishedIterations	Number of iterations that are already finished in the current training.
CurrentTrainingNumIterations	Total number of training iterations that will be performed during the current training of the deep learning tool. After the end of the training, this number is the actual number of iterations performed during the training which can be lower than the number of iterations given to the EDeepLearningTool::Train method (for example if the user called EDeepLearningTool::StopTraining).
CurrentTrainingProgression	Current training progression as a percentage (between 0 and 1).
DeterministicTrainingRandomSeed	Random seed to use when EDeepLearningTool::EnableDeterministicTraining is set to true. The default value is 42. When EDeepLearningTool::EnableDeterministicTraining, the random seed is generated using a random non-deterministic source.
EnableDeterministicTraining	Whether to use determinitic training algorithm that allows to repeatable training results. Default value: false.
EnableGPU	Deprecated: Use EDeepLearningTool. Enable the use of a GPU for training and inference of the deep learning tool. If the active engine is not the default engine, EDeepLearningTool::EnableGPU will be false even if the active device has a GPU device type. Setting EDeepLearningTool::EnableGPU to any value when the active engine is not the default one will throw an exception.
Engine	Sets the engine with which to execute or train the neural network.
ExecutionSettings	Execution settings of the tool (engine, device(s), inference precision, batch size settings).
GPUIndexes	Deprecated: use EDeepLearningTool or EDeepLearningTool::ActiveDevices. Indexes of the GPUs to use for computations. Using multiple GPUs is only possible when we can process multiple images at once, i.e. during training (EDeepLearningTool::Train) or batch inference. By default, all the detected GPUs will be used.
ImageCacheSize	Size in byte of the image cache. The cache is used during training to store reformatted and normalized images. A correctly sized cache can reduce the hard drive accesses and the preprocessing time for each image.
InferenceModelPath	Path of the inference model when loaded or saved using EDeepLearningTool::SaveInferenceModel, EDeepLearningTool::LoadInferenceModel or EDeepLearningTool::SerializeInferenceModel.
InferencePrecision	Inference precision. Use EDeepLearningDevice::IsPrecisionSupported to check whether a device support the given precision.
NumActiveDevices	Gets the number of devices with which to run or train the model.
NumAvailableDevices	Available devices for the current EDeepLearningTool::Engine.

NumAvailableEngines	Number of available engines.
NumGPUs	Deprecated: use EDeepLearningTool with a device type of GPU. Number of detected NVIDIA GPU.
NumLabels	Number of labels of this tool. If the tool is not trained, the method will throw an exception.
NumTrainedIterations	Number of iterations that were performed to train this deep learning tool.
OptimizeBatchSize	Indicates whether to optimize the batch size (see EDeepLearningTool::BatchSize) to maximize the training and inference speed according to the engine, the device and the available memory. Default value is true.
Path	Path of the tool when loaded or saved using EDeepLearningTool::Save, EDeepLearningTool::Load or EDeepLearningTool.
SettingsPath	Path of the settings when loaded or saved using EDeepLearningTool::SaveSettings, EDeepLearningTool::LoadSettings or EDeepLearningTool::SerializeSettings.
ToolType	Type of the deep learning tool.
TrainingModelPath	Path of the training model when loaded or saved using EDeepLearningTool::SaveTrainingModel, EDeepLearningTool::LoadTrainingModel or EDeepLearningTool::SerializeTrainingModel.

Methods

Create	Factory method to open a deep learning tool. Returns the corresponding deep learning tool that must be deleted by the caller.
GetActiveDevice	Gets the active device. By default, it returns the first active device.
GetAvailableDevice	-
GetAvailableDeviceName	Name of the i-th device of the current engine.
GetAvailableDevicesForEngine	Available devices for the specified engine.
GetAvailableEngineName	Gets the name of the engine given its id.
GetLabel	Gets the label from its index. If the tool is not trained, the method may throw an exception.
GetLabelColor	Label color. The label colors affect how the results will be displayed. The default label colors are the one specified in the dataset used for training.
GetLabelOpacity	Gets the label opacity (between 0 for fully transparent and 255 for opaque color). The label opacities affect with the label colors how the results will be displayed. The default label opacities are the one specified in the dataset used for training.

GetLabelWeight	Gets the label weight. If the tool is not trained, the label weights are not defined. After training, they are set to the value of the training dataset label weights.
GetNumPatchesForImage	Number of patches that will be extracted from an input image to perform inference. For EasyClassify and EasyLocate, this will always be equal to 1. For EasySegment, the number of patches will depend on the scale, patch size and sampling density parameters.
GetOptimalNumImagesForBatchSize	Optimal number of images to process together for inference given the batch size and EDeepLearningTool::GetNumPatchesForImage. In practice, for EasyClassify and EasyLocate, this is the same as the batch size. For EasySegment, the value will depend on the scale, patch size and sampling density parameters.
HasInferenceModel	Whether the inference model is loaded or created when the tool is not yet trained.
HasTrainingModel	Whether the training model is loaded or created when the tool is not yet trained.
InitializeInference	Initializes the neural network for inference (i.e. making predictions with the neural network). You need to pass an image or a vector of images with the same characteristics (image resolution, image type and number of image) as the image or vector of images that you will use to make inference with this tool.
IsTrained	Tells whether the deep learning tool has been trained.
IsTraining	Indicates whether the object is currently training.
Load	Loads a deep learning tool. The given ESerializer must have been created for reading.
LoadInferenceModel	Loads the tool's inference model. The inference model is required to apply the tool on new images.
LoadSettings	Loads the settings of a tool.
LoadTrainingModel	Loads the tool's training model. The training model is required to continue a training.
Save	Saves the settings, inference and training model of the deep learning tool. The given ESerializer must have been created for writing.
SaveInferenceModel	Saves the tool's inference model to a file.
SaveSettings	Saves the settings of the tool to a file.
SaveTrainingModel	Saves the tool's training model to a file.
SerializeInferenceModel	Serializes the inference model of the tool.
SerializeSettings	Serializes the tool settings.
SerializeTrainingModel	Serializes the training model of the tool. The training model is necessary to continue training the tool.

SetActiveDevice	Sets the device with which to run or train the model.
SetLabel	Changes a label predicted by the tool.
SetLabelColor	Changes a label color.
SetLabelOpacity	Changes a label opacity (between 0 for fully transparent and 255 for opaque color).
SetLabelWeight	Sets the label weight. If the tool is not trained, the label weights are not defined. After training, they are set to the value of the training dataset label weights.
StopTraining	Stops training and returns the last completed iteration. If the parameter 'wait' is set to true, the method will wait for the training thread to completely stop. Otherwise, the method will return immediately.
Train	Trains the EDeepLearningTool with the given dataset for the specified number of iterations. At the end of the training, the deep learning tool is in the state it was at the iteration that gave the minimum validation error. See EDeepLearningTool::BestIteration.
UnloadInferenceModel	Unloads the inference model.
UnloadModels	Unloads the inference and training model.
UnloadTrainingModel	Unloads the training model.
WaitForIterationCompletion	Waits until an iteration is complete. A call to this method will block the calling thread until a training iteration in the training thread is finished. This method returns the number of trained iterations.
WaitForTrainingCompletion	Waits until the training is complete or the timeout is expired. A call to this method will block the calling thread for the shortest time between the timeout and the time it takes for the training to complete. A negative timeout means that the method will wait until the training is complete. The default value is set to -1. The method returns the number of trained iterations.

EDeepLearningTool.ActiveDeviceById

Sets the device with which to run the model using its index in the list returned by EDeepLearningTool::AvailableDevices.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int ActiveDeviceById
  { get; set; }
```

EDeepLearningTool.ActiveDeviceByName

Sets the device with which to run the model using its name.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string ActiveDeviceByName
  { get; set; }
```

EDeepLearningTool.ActiveDevices

Devices with which to run or train the model.
Only multiple GPUs with the default engine is supported.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice[] ActiveDevices
  { get; set; }
```

EDeepLearningTool.ActiveDevicesById

Sets the devices with which to run the model using their index in the list returned by EDeepLearningTool::AvailableDevices.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int[] ActiveDevicesById
  { get; set; }
```

EDeepLearningTool.AutoSavePeriod

Auto-save period. The auto-save period is the number of training iterations between each automatic save of the model.
In order for the model to be automatically saved during the training, the tool must have been loaded or saved to a file. The path where the tool will be saved is either indicated by EDeepLearningTool::Path or the three paths EDeepLearningTool::SettingsPath, EDeepLearningTool::InferenceModelPath, and EDeepLearningTool::TrainingModelPath. If one of these path is empty, the corresponding part of the tool will not be saved automatically during training.
By default, auto save is disabled and the period is equal to 0.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int AutoSavePeriod
  { get; set; }
```

EDeepLearningTool.AvailableDevices

Get all available device for the current engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice[] AvailableDevices
  { get; }
```

EDeepLearningTool.AvailableEngines

Available engines.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
static string[] AvailableEngines
  { get; }
```

EDeepLearningTool.BatchSize

Batch size. The batch size is the number of images that are processed together during training and batch inference.
When using multi-GPUs processing (see EDeepLearningTool::GPUIndexes), the batch size is the number of images that each GPU will process at once.
A large batch size will increase the processing speed on GPU but also the memory requirements.
The batch size must be bigger or equal to 1 and it is commonly chosen to be a power of 2.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BatchSize
  { get; set; }
```

Remarks

If EDeepLearningTool::OptimizeBatchSize is 'true', then the value of this property will be optimized automatically for training or inference according to the situation.
See also EDeepLearningTool::BatchSizeForMaximumInferenceSpeed.

EDeepLearningTool.BatchSizeForMaximumInferenceSpeed

Computes the batch size that will maximize the inference speed on NVIDIA GPU. For all other devices, it will return 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BatchSizeForMaximumInferenceSpeed
  { get; }
```

Remarks

This value is given as an indication and should not necessarily be used in practice.
You must choose a tradeoff between the overall inference speed (also called the throughput), which is limited by this value, and the time it takes to compute the result of a whole batch (also called the latency), which is minimized by making inference image per image (i.e. a batch size of 1).
The tradeoff depends on your particular application.
Throw EError_DeepLearningToolNotTrained if the tool is not trained.

EDeepLearningTool.BestIteration

Iteration at which the minimum validation error was reached. After training, the tool is in the state it was at this best iteration.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int BestIteration
  { get; }
```

EDeepLearningTool.Create

Factory method to open a deep learning tool.
Returns the corresponding deep learning tool that must be deleted by the caller.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningTool Create(
 string path
 )

Euresys.Open_eVision.EasyDeepLearning.EDeepLearningTool Create(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Path to a deep learning tool.

serializer

A serializer created for reading.

EDeepLearningTool.CurrentTrainingFinishedIterations

Number of iterations that are already finished in the current training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint CurrentTrainingFinishedIterations
  { get; }
```

EDeepLearningTool.CurrentTrainingNumIterations

Total number of training iterations that will be performed during the current training of the deep learning tool.
After the end of the training, this number is the actual number of iterations performed during the training which can be lower than the number of iterations given to the EDeepLearningTool::Train method (for example if the user called EDeepLearningTool::StopTraining).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint CurrentTrainingNumIterations
  { get; }
```

EDeepLearningTool.CurrentTrainingProgression

Current training progression as a percentage (between 0 and 1).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float CurrentTrainingProgression
  { get; }
```

EDeepLearningTool.DeterministicTrainingRandomSeed

Random seed to use when EDeepLearningTool::EnableDeterministicTraining is set to true. The default value is 42.
When EDeepLearningTool::EnableDeterministicTraining, the random seed is generated using a random non-deterministic source.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int DeterministicTrainingRandomSeed
  { get; set; }
```

EDeepLearningTool.EnableDeterministicTraining

Whether to use determinitic training algorithm that allows to repeatable training results. Default value: false.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool EnableDeterministicTraining
  { get; set; }
```

Remarks

Deterministic training is not guarenteed when:
- using multi-core processing is enabled (see Easy::MaxNumberOfProcessingThreads) regardless of the value of EDeepLearningTool::EnableGPU).
- performing several training on the same tool in succession.

EDeepLearningTool.EnableGPU

This property is deprecated.

Deprecated: Use EDeepLearningTool.
Enable the use of a GPU for training and inference of the deep learning tool. If the active engine is not the default engine, EDeepLearningTool::EnableGPU will be false even if the active device has a GPU device type. Setting EDeepLearningTool::EnableGPU to any value when the active engine is not the default one will throw an exception.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool EnableGPU
  { get; set; }
```

EDeepLearningTool.Engine

Sets the engine with which to execute or train the neural network.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Engine
  { get; set; }
```

EDeepLearningTool.ExecutionSettings

Execution settings of the tool (engine, device(s), inference precision, batch size settings).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningExecutionSettings ExecutionSettings
  { get; set; }
```

EDeepLearningTool.GetActiveDevice

Gets the active device. By default, it returns the first active device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice GetActiveDevice(
 int i
 )
```

Parameters

i

Index of the active devices between 0 and EDeepLearningTool::NumActiveDevices.

EDeepLearningTool.GetAvailableDevice

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice GetAvailableDevice(
 int i
 )
```

Parameters

i

-

EDeepLearningTool.GetAvailableDeviceName

Name of the i-th device of the current engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetAvailableDeviceName(
 int i
 )
```

Parameters

i

Index of the device between 0 and EDeepLearningTool - 1.

EDeepLearningTool.GetAvailableDevicesForEngine

Available devices for the specified engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice[]
GetAvailableDevicesForEngine(
 string engine
 )
```

Parameters

engine

Engine for which to get the devices

EDeepLearningTool.GetAvailableEngineName

Gets the name of the engine given its id.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetAvailableEngineName(
 int id
 )
```

Parameters

id

Index of the available engine between 0 and EDeepLearningTool::NumAvailableEngines - 1.

EDeepLearningTool.GetLabel

Gets the label from its index. If the tool is not trained, the method may throw an exception.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetLabel(
 uint index
 )
```

Parameters

index

Index of the label

EDeepLearningTool.GetLabelColor

Label color. The label colors affect how the results will be displayed.
The default label colors are the one specified in the dataset used for training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ERGBColor GetLabelColor(
 uint index
 )
```

Parameters

index

Index of the label between 0 and EDeepLearningTool::NumLabels

EDeepLearningTool.GetLabelOpacity

Gets the label opacity (between 0 for fully transparent and 255 for opaque color). The label opacities affect with the label colors how the results will be displayed.
The default label opacities are the one specified in the dataset used for training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
byte GetLabelOpacity(
 uint index
 )
```

Parameters

index

Index of the label between 0 and EDeepLearningTool::NumLabels

EDeepLearningTool.GetLabelWeight

Gets the label weight. If the tool is not trained, the label weights are not defined. After training, they are set to the value of the training dataset label weights.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelWeight(
 uint index
 )
```

Parameters

index

Index of the label

EDeepLearningTool.GetNumPatchesForImage

Number of patches that will be extracted from an input image to perform inference.
For EasyClassify and EasyLocate, this will always be equal to 1.
For EasySegment, the number of patches will depend on the scale, patch size and sampling density parameters.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumPatchesForImage(
 Euresys.Open_eVision.EBaseROI sampleImage
 )

int GetNumPatchesForImage(
 int imageWidth,
 int imageHeight
 )
```

Parameters

sampleImage
Image for which to get the number of patch

imageWidth
Width of the image for which to get the number of patch

imageHeight
Height of the image for which to get the number of patch

EDeepLearningTool.GetOptimalNumImagesForBatchSize

Optimal number of images to process together for inference given the batch size and EDeepLearningTool::GetNumPatchesForImage.
In practice, for EasyClassify and EasyLocate, this is the same as the batch size.
For EasySegment, the value will depend on the scale, patch size and sampling density parameters.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int GetOptimalNumImagesForBatchSize(
 Euresys.Open_eVision.EBaseROI sampleImage
 )
int GetOptimalNumImagesForBatchSize(
 int imageWidth,
 int imageHeight
 )
```

Parameters

sampleImage
Image for which to get the optimal number of images

imageWidth
Width of the image for which to get the optimal number of images

imageHeight
Height of the image for which to get the optimal number of images

EDeepLearningTool.GPUIndexes

This property is deprecated.

Deprecated: use EDeepLearningTool or EDeepLearningTool::ActiveDevices.
Indexes of the GPUs to use for computations.
Using multiple GPUs is only possible when we can process multiple images at once, i.e. during training (EDeepLearningTool::Train) or batch inference.
By default, all the detected GPUs will be used.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint[] GPUIndexes
  { get; set; }
```

Remarks

The GPU are indexed from 0 to EDeepLearningTool::NumGPUs - 1.

EDeepLearningTool.HasInferenceModel

Whether the inference model is loaded or created when the tool is not yet trained.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasInferenceModel(
 )
```

EDeepLearningTool.HasTrainingModel

Whether the training model is loaded or created when the tool is not yet trained.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasTrainingModel(
 )
```

EDeepLearningTool.ImageCacheSize

Size in byte of the image cache. The cache is used during training to store reformatted and normalized images. A correctly sized cache can reduce the hard drive accesses and the preprocessing time for each image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
System.UInt64 ImageCacheSize
  { get; set; }
```

EDeepLearningTool.InferenceModelPath

Path of the inference model when loaded or saved using EDeepLearningTool::SaveInferenceModel, EDeepLearningTool::LoadInferenceModel or EDeepLearningTool::SerializeInferenceModel.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string InferenceModelPath
  { get; }
```

EDeepLearningTool.InferencePrecision

Inference precision.
Use EDeepLearningDevice::IsPrecisionSupported to check whether a device support the given precision.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningInferencePrecision
InferencePrecision
  { get; set; }
```

EDeepLearningTool.InitializeInference

Initializes the neural network for inference (i.e. making predictions with the neural network).
You need to pass an image or a vector of images with the same characteristics (image resolution, image type and number of image) as the image or vector of images that you will use to make inference with this tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void InitializeInference(
 int width,
 int height,
 Euresys.Open_eVision.EImageType imageType,
 int numImages
 )

void InitializeInference(
 Euresys.Open_eVision.EBaseROI img
 )
```

```
void InitializeInference(
 ref Euresys.Open_eVision.EBaseROI[] imgList
 )
void InitializeInference(
 ref Euresys.Open_eVision.EImageBW8[] imgList
 )
void InitializeInference(
 ref Euresys.Open_eVision.EImageBW16[] imgList
 )
void InitializeInference(
 ref Euresys.Open_eVision.EImageC24[] imgList
 )
```

Parameters

width
Width of the images for which to prepare the tool for inference

height
Height of the images for which to prepare the tool for inference

imageType
Type of the images for which to prepare the tool for inference

numImages
Width of the images for which to prepare the tool for inference

img
Image for which to prepare the tool for inference

imgList
Vector of images for which to prepare the tool for inference

EDeepLearningTool.IsTrained

Tells whether the deep learning tool has been trained.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsTrained(
 )
```

EDeepLearningTool.IsTraining

Indicates whether the object is currently training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsTraining(
 )
```

EDeepLearningTool.Load

Loads a deep learning tool. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Load(
 string filePath
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

File path.

serializer

Pointer to the ESerializer created for reading.

EDeepLearningTool.LoadInferenceModel

Loads the tool's inference model. The inference model is required to apply the tool on new images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void LoadInferenceModel(
 string filePath
 )
```

Parameters

filePath

File path.

EDeepLearningTool.LoadSettings

Loads the settings of a tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void LoadSettings(
 string filePath
 )
```

Parameters

filePath

File path.

EDeepLearningTool.LoadTrainingModel

Loads the tool's training model. The training model is required to continue a training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void LoadTrainingModel(
 string filePath
 )
```

Parameters

filePath

File path.

EDeepLearningTool.NumActiveDevices

Gets the number of devices with which to run or train the model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumActiveDevices
  { get; }
```

EDeepLearningTool.NumAvailableDevices

Available devices for the current EDeepLearningTool::Engine.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int NumAvailableDevices
  { get; }
```

EDeepLearningTool.NumAvailableEngines

Number of available engines.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
static int NumAvailableEngines
  { get; }
```

EDeepLearningTool.NumGPUs

This property is deprecated.

Deprecated: use EDeepLearningTool with a device type of GPU.
Number of detected NVIDIA GPU.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumGPUs
  { get; }
```

EDeepLearningTool.NumLabels

Number of labels of this tool. If the tool is not trained, the method will throw an exception.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumLabels
  { get; }
```

Remarks

Some type of tools such as EUnsupervisedSegmenter may have no label at all. For these tools, there is a separate API to control the predicted labels.

EDeepLearningTool.NumTrainedIterations

Number of iterations that were performed to train this deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumTrainedIterations
```

```
{ get; }
```

Remarks

This number of iteration may result from the addition of the iterations performed in several calls to EDeepLearningTool::Train.
An iteration can also be called an epoch.

EDeepLearningTool.OptimizeBatchSize

Indicates whether to optimize the batch size (see EDeepLearningTool::BatchSize) to maximize the training and inference speed according to the engine, the device and the available memory.
Default value is true.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool OptimizeBatchSize
  { get; set; }
```

EDeepLearningTool.Path

Path of the tool when loaded or saved using EDeepLearningTool::Save, EDeepLearningTool::Load or EDeepLearningTool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Path
  { get; }
```

EDeepLearningTool.Save

Saves the settings, inference and training model of the deep learning tool.
The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string filePath,
 bool includeTrainingModel
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer,
 bool includeTrainingModel
 )
```

Parameters

filePath

File path.

includeTrainingModel

Whether to save the training model. The training model is required to continue training the tool.

serializer

Pointer to the ESerializer created for writing.

EDeepLearningTool.SaveInferenceModel

Saves the tool's inference model to a file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SaveInferenceModel(
 string filePath
 )
```

Parameters

filePath

File path.

EDeepLearningTool.SaveSettings

Saves the settings of the tool to a file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SaveSettings(
 string filePath
 )
```

Parameters

filePath

File path.

EDeepLearningTool.SaveTrainingModel

Saves the tool's training model to a file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SaveTrainingModel(
 string filePath
 )
```

Parameters

filePath

File path.

EDeepLearningTool.SerializeInferenceModel

Serializes the inference model of the tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SerializeInferenceModel(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

EDeepLearningTool.SerializeSettings

Serializes the tool settings.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

EDeepLearningTool.SerializeTrainingModel

Serializes the training model of the tool.
The training model is necessary to continue training the tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SerializeTrainingModel(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

EDeepLearningTool.SetActiveDevice

Sets the device with which to run or train the model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetActiveDevice(
 Euresys.Open_eVision.EasyDeepLearning.EDeepLearningDevice device
 )
```

Parameters

device

-

Remarks

For CPU device, the number of thread is initialized from Easy

EDeepLearningTool.SetLabel

Changes a label predicted by the tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetLabel(
 uint index,
 string label
 )
```

Parameters

index

Index of the label

label

New label

Remarks

Be careful when changing one of the label of a trained tool. It can create incompatibilities with previous metrics or results computed with this tool or with the dataset used to trained the tool.
Some tools may not use this label API. For example EUnsupervisedSegmenter uses EUnsupervisedSegmenter::GoodLabel instead.

EDeepLearningTool.SetLabelColor

Changes a label color.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetLabelColor(
 uint index,
 Euresys.Open_eVision.ERGBColor c
 )
```

Parameters

index

Index of the label between 0 and EDeepLearningTool::NumLabels

c

New color for the specified label

EDeepLearningTool.SetLabelOpacity

Changes a label opacity (between 0 for fully transparent and 255 for opaque color).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetLabelOpacity(
 uint index,
 byte opacity
 )
```

Parameters

index

Index of the label between 0 and EDeepLearningTool::NumLabels

opacity

New opacity for the specified label

EDeepLearningTool.SetLabelWeight

Sets the label weight. If the tool is not trained, the label weights are not defined. After training, they are set to the value of the training dataset label weights.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SetLabelWeight(
 uint index,
 float weight
 )
```

Parameters

index

Index of the label

weight

Weight

EDeepLearningTool.SettingsPath

Path of the settings when loaded or saved using EDeepLearningTool::SaveSettings, EDeepLearningTool::LoadSettings or EDeepLearningTool::SerializeSettings.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string SettingsPath
  { get; }
```

EDeepLearningTool.StopTraining

Stops training and returns the last completed iteration. If the parameter 'wait' is set to true, the method will wait for the training thread to completely stop. Otherwise, the method will return immediately.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int StopTraining(
 bool wait
 )
```

Parameters

wait

Whether to wait for the training to completely stop

EDeepLearningTool.ToolType

Type of the deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
abstract Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType ToolType
  { get; }
```

EDeepLearningTool.Train

Trains the EDeepLearningTool with the given dataset for the specified number of iterations. At the end of the training, the deep learning tool is in the state it was at the iteration that gave the minimum validation error. See EDeepLearningTool::BestIteration.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Train(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset,
 int iterations
 )

void Train(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset,
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation dataAugmentation,
 int iterations
 )

void Train(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset trainingDataset,
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset validationDataset,
 int iterations
 )
```

```
void Train(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset trainingDataset,
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset validationDataset,
 Euresys.Open_eVision.EasyDeepLearning.EDataAugmentation dataAugmentation,
 int iterations
 )
```

Parameters

dataset

EClassificationDataset with which to train and validate the deep learning tool

iterations

Number of iterations for training.

dataAugmentation

Data augmentation to use during training

trainingDataset

EClassificationDataset with which to train the deep learning tool

validationDataset

EClassificationDataset with which to validate the deep learning tool

EDeepLearningTool.TrainingModelPath

Path of the training model when loaded or saved using EDeepLearningTool::SaveTrainingModel, EDeepLearningTool::LoadTrainingModel or EDeepLearningTool::SerializeTrainingModel.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string TrainingModelPath
  { get; }
```

EDeepLearningTool.UnloadInferenceModel

Unloads the inference model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void UnloadInferenceModel(
 )
```

EDeepLearningTool.UnloadModels

Unloads the inference and training model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void UnloadModels(
 )
```

EDeepLearningTool.UnloadTrainingModel

Unloads the training model.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void UnloadTrainingModel(
 )
```

EDeepLearningTool.WaitForIterationCompletion

Waits until an iteration is complete. A call to this method will block the calling thread until a training iteration in the training thread is finished. This method returns the number of trained iterations.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int WaitForIterationCompletion(
 )
```

EDeepLearningTool.WaitForTrainingCompletion

Waits until the training is complete or the timeout is expired. A call to this method will block the calling thread for the shortest time between the timeout and the time it takes for the training to complete.
A negative timeout means that the method will wait until the training is complete.
The default value is set to -1.
The method returns the number of trained iterations.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int WaitForTrainingCompletion(
 int timeout
 )
```

Parameters

timeout

Timeout in second

4.80. EDepthMap Class

Represents a generic DepthMap type interface.

Derived Class(es):EDepthMap16EDepthMap32fEDepthMap8

Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisSystemType	Manage the axis coordinate system.
Height	Access depth map Height.
RowPitch	Returns the buffer row pitch.
Type	Returns the image type.
Width	Access depth map Width.
ZResolution	Access the Z Resolution (depth units per grey scale value).

Methods

AddMetadata	Adds a metadata key (name) and value. Overwrites if exists.
Clear	Clears the depth map: replaces all pixels with undefined value
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Pixel coordinates.
ConvertCoordinatesPixelToMap	Converts Pixel coordinates to 3D Map coordinates.
DeleteMetadata	Deletes an existing metadata. Throws an exception if it does not exist.
Draw	Draws a DepthMap in a device context.
DrawImage	Displays the internal image buffer
GetBufferPtr	Retrieves the pointer of the pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer of the pixel buffer.
GetMetadata	Returns string value of the given metadata. Throws an exception if it does not exist.
GetZValue	Gets the Z value of a pixel.
IsVoid	Tests if the EDepthMap object has a size of zero.
Load	Restores the EDepthMap stored in the given Open eVision file.

LoadImage	Restores the EDepthMap image stored in the given image file.
LoadImageAndMetadata	Loads the image and the metadata from a file in JSON format.
LoadMetadata	Loads the metadata from a file in JSON format.
ModifyMetadata	Changes the value of an existing metadata. Throws an exception if the metadata does not exist.
Save	Saves the EDepthMap object to the given Open eVision file.
SaveImage	Saves the EDepthMap image to the given image file.
SaveImageAndMetadata	Saves the image and the metadata to a JSON format file.
SaveJpeg	Saves the EDepthMap object to the given image file, in JPEG format.
SaveJpeg2K	Saves the EDepthMap object to the given image file, in JPEG 2000 format.
SaveMetadata	Saves the metadata to a file in JSON format
SetBufferPtr	Sets the pointer to an externally allocated buffer.
SetSize	Sets the width and height of a DepthMap.

EDepthMap.AddMetadata

Adds a metadata key (name) and value. Overwrites if exists.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EDepthMap.AxisSystemType

Manage the axis coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract Euresys.Open_eVision.Easy3D.EAxisSystemType AxisSystemType
```

```
{ get; set; }
```

EDepthMap.Clear

Clears the depth map: replaces all pixels with undefined value

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Clear(
 )
```

EDepthMap.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ClearMetadata(
 )
```

EDepthMap.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D
The Map X coordinate.

y3D
The Map Y coordinate.

xBuffer
The returned Pixel X coordinate.

yBuffer
The returned Pixel Y coordinate.

EDepthMap.ConvertCoordinatesPixelToMap

Converts Pixel coordinates to 3D Map coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer
The pixel X coordinate.

yBuffer
The pixel Y coordinate.

x3D
The returned Map X coordinate.

y3D
The returned Map Y coordinate.

EDepthMap.DeleteMetadata

Deletes an existing metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DeleteMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap.Draw

Draws a DepthMap in a device context.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the depthmap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A DepthMap can be drawn (its pixels rendered) using a device context.
EDepthMap::Draw takes the axis coordinate system in account. See EDepthMap.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context.
EDepthMap::DrawImage does not takes the axis coordinate system in account. It displays the internal image buffer without flipping the axis. See EDepthMap::Draw method for an alternative drawing method.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap.GetBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EDepthMap.GetCheckedBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function checks the value of the parameters.

EDepthMap.GetMetadata

Returns string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap.GetZValue

Gets the Z value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float GetZValue(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap.Height

Access depth map Height.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract int Height
  { get; set; }
```

EDepthMap.IsVoid

Tests if the EDepthMap object has a size of zero.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsVoid(
 )
```

Remarks

Returns true if the depthmap size is zero.

EDepthMap.Load

Restores the EDepthMap stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
```

Parameters

path

Full path of the file.

Remarks

When loading, the depth map is resized if needed.
This function restores the depth map attributes.

EDepthMap.LoadImage

Restores the EDepthMap image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the depth map is resized if need be.
This function does not restore the depth map attributes, only the image associated with the EDepthMap is updated.

EDepthMap.LoadImageAndMetadata

Loads the image and the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string pathImage,
 string pathMetadata
 )
```

Parameters

pathImage

Full path to the image file.

pathMetadata

Full path to the metadata file.

EDepthMap.LoadMetadata

Loads the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path

Full path to the file.

EDepthMap.ModifyMetadata

Changes the value of an existing metadata.
Throws an exception if the metadata does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of an existing metadata.

value

The value for the given metadata.

EDepthMap.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract int RowPitch
  { get; }
```

EDepthMap.Save

Saves the EDepthMap object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
```

Parameters

path

The full path to the destination file.

Remarks

This function saves the EDepthMap in a Open eVision file.
This function stores the depth map attributes.

EDepthMap.SaveImage

Saves the EDepthMap image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This function saves the image associated to EDepthMap in a standard image file and thus does not store depth map attributes.

EDepthMap.SaveImageAndMetadata

Saves the image and the metadata to a JSON format file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string pathImage,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

pathImage

The full path to the destination image file.

pathMetadata

The full path to the destination metadata file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

EDepthMap.SaveJpeg

Saves the EDepthMap object to the given image file, in JPEG format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG quality, between 0 and 100 (100 is best quality). The default value is 75.

EDepthMap.SaveJpeg2K

Saves the EDepthMap object to the given image file, in JPEG 2000 format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveJpeg2K(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG 2000 quality, between 1 and 512.
The default value is 16.

EDepthMap.SaveMetadata

Saves the metadata to a file in JSON format

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EDepthMap.SetBufferPtr

Sets the pointer to an externally allocated buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the image.

bitsPerRow

The total number of bits contained in a row, padding included. Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EDepthMap::SetBufferPtr.

EDepthMap.SetSize

Sets the width and height of a DepthMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetSize(
 int width,
 int height
 )
void SetSize(
 Euresys.Open_eVision.Easy3D.EDepthMap other
 )
```

Parameters

width

The new requested DepthMap width.

height

The new requested DepthMap height.

other

The other DepthMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new buffer (deallocate the old buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new buffer and setting its size creates a 4-byte aligned buffer, by default.

EDepthMap.Type

Returns the image type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract Euresys.Open_eVision.EImageType Type
  { get; }
```

EDepthMap.Width

Access depth map Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract int Width
  { get; set; }
```

EDepthMap.ZResolution

Access the Z Resolution (depth units per grey scale value).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract float ZResolution
  { get; set; }
```

4.81. EDepthMap16 Class

Represents a EDepthMap with an 16-bit pixel internal representation.

Base Class:EDepthMap
Derived Class(es):EGrabberDepthMap16
Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisSystemType	Manage the axis coordinate system.
Height	Access depth map Height.

RowPitch	Returns the buffer row pitch.
Type	Returns the image type.
UndefinedValue	Returns the Undefined value. That value is used to mark pixels with no valid depth value.
Width	Access depth map Width.
ZResolution	Access the Z Resolution (depth units per grey scale value).

Methods

AddMetadata	Adds a metadata key (name) and value. Overwrites if exists.
AsEImage	Casts the EDepthMap16 to an EImageBW16 to use with the Open eVision 2D tools.
Clear	Clears the depth map: replaces all pixels with undefined value
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Pixel coordinates.
ConvertCoordinatesPixelToMap	Converts Pixel coordinates to 3D Map coordinates.
CopyMetadataTo	Copies all metadata to another EDepthMap16.
DeleteMetadata	Deletes an existing metadata. Throws an exception if it does not exist.
Draw	Draws a DepthMap in a device context.
DrawImage	Displays the internal image buffer
EDepthMap16	Creates a 16 bits EDepthMap.
FillUndefinedPixels	Fills undefined pixels, used to fill the "holes" in the depth map.
FillUndefinedPixelsWithMedian	Fills undefined pixels, used to fill the "holes" in the depth map using a median rectangular kernel of odd size.
GetBufferPtr	Retrieves the pointer of the pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer of the pixel buffer.
GetMetadata	Returns string value of the given metadata. Throws an exception if it does not exist.
GetPixel	Gets the value of a pixel.
GetZValue	Gets Z value of a pixel.
IsVoid	Tests if the EDepthMap16 object has a size of zero.
Load	Restores the EDepthMap16 stored in the given Open eVision file.
LoadImage	Restores the EDepthMap16 image stored in the given image file.
LoadImageAndMetadata	Loads the image and the metadata from a file in JSON format.
LoadMetadata	Loads the metadata from a file in JSON format.

ModifyMetadata	Changes the value of an existing metadata. Throws an exception if the metadata does not exist.
operator=	Assignment operator.
Save	Saves the EDepthMap16 object to the given Open eVision file.
SaveImage	Saves the EDepthMap16 image to the given image file.
SaveImageAndMetadata	Saves the image and the metadata to a JSON format file.
SaveJpeg	Saves the EDepthMap16 object to the given image file, in JPEG format.
SaveJpeg2K	Saves the EDepthMap16 object to the given image file, in JPEG 2000 format.
SaveMetadata	Saves the metadata to a file in JSON format
SetBufferPtr	Sets the pointer to an externally allocated buffer.
SetPixel	Sets the value of a pixel.
SetSize	Sets the width and height of a DepthMap.

EDepthMap16.AddMetadata

Adds a metadata key (name) and value. Overwrites if exists.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EDepthMap16.AsEImage

Casts the EDepthMap16 to an EImageBW16 to use with the Open eVision 2D tools.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW16 AsEImage(
 )
```

EDepthMap16.AxisSystemType

Manage the axis coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
override Euresys.Open_eVision.Easy3D.EAxisSystemType AxisSystemType
  { get; set; }
```

EDepthMap16.Clear

Clears the depth map: replaces all pixels with undefined value

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Clear(
 )
```

EDepthMap16.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearMetadata(
 )
```

EDepthMap16.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D
The Map X coordinate.

y3D
The Map Y coordinate.

xBuffer
The returned Pixel X coordinate.

yBuffer
The returned Pixel Y coordinate.

EDepthMap16.ConvertCoordinatesPixelToMap

Converts Pixel coordinates to 3D Map coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer
The pixel X coordinate.

yBuffer
The pixel Y coordinate.

x3D
The returned Map X coordinate.

y3D
The returned Map Y coordinate.

EDepthMap16.CopyMetadataTo

Copies all metadata to another EDepthMap16.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void CopyMetadataTo(
 Euresys.Open_eVision.Easy3D.EDepthMap16 other
 )
```

Parameters

other

The destination EDepthMap16.

EDepthMap16.DeleteMetadata

Deletes an existing metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DeleteMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap16.Draw

Draws a DepthMap in a device context.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the depthmap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A DepthMap can be drawn (its pixels rendered) using a device context.
EDepthMap16::Draw takes the axis coordinate system in account. See EDepthMap16.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap16.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context. EDepthMap16::DrawImage does not takes the axis coordinate system in account. It displays the internal image buffer without flipping the axis. See EDepthMap16::Draw method for an alternative drawing method.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap16.EDepthMap16

Creates a 16 bits EDepthMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EDepthMap16(
 )
void EDepthMap16(
 int width,
 int height
 )
void EDepthMap16(
 Euresys.Open_eVision.Easy3D.EDepthMap16 other
 )
```

Parameters

width

The width of the new depth map.

height

The height of the new depth map.

other

Another depth map.

EDepthMap16.FillUndefinedPixels

Fills undefined pixels, used to fill the "holes" in the depth map.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void FillUndefinedPixels(
 Euresys.Open_eVision.Easy3D.EDepthMap16 outMap,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

outMap

The destination depth map.

direction

Direction in which the undefined pixels are filled in a depthmap from EFillUndefinedPixelsDirection.

method

Which values used to fill the undefined pixels in a depthmap from EFillUndefinedPixelsMethod.

EDepthMap16.FillUndefinedPixelsWithMedian

Fills undefined pixels, used to fill the "holes" in the depth map using a median rectangular kernel of odd size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void FillUndefinedPixelsWithMedian(
 Euresys.Open_eVision.Easy3D.EDepthMap16 outMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

outMap

The destination depth map

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 2).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth).

EDepthMap16.GetBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EDepthMap16.GetCheckedBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function checks the value of the parameters.

EDepthMap16.GetMetadata

Returns string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap16.GetPixel

Gets the value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth16 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap16.GetZValue

Gets Z value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float GetZValue(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap16.Height

Access depth map Height.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Height
  { get; set; }
```

EDepthMap16.IsVoid

Tests if the EDepthMap16 object has a size of zero.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsVoid(
 )
```

Remarks

Returns true if the depthmap size is zero.

EDepthMap16.Load

Restores the EDepthMap16 stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path of the file.

serializer

-

Remarks

When loading, the depth map is resized if needed.
This function restores the depth map attributes.

EDepthMap16.LoadImage

Restores the EDepthMap16 image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the depth map is resized if need be.
This function does not restore the depth map attributes, only the image associated with the EDepthMap16 is updated.

EDepthMap16.LoadImageAndMetadata

Loads the image and the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string pathImage,
 string pathMetadata
 )
```

Parameters

pathImage
Full path to the image file.

pathMetadata
Full path to the metadata file.

EDepthMap16.LoadMetadata

Loads the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path
Full path to the file.

EDepthMap16.ModifyMetadata

Changes the value of an existing metadata.
Throws an exception if the metadata does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key
The name of an existing metadata.

value
The value for the given metadata.

EDepthMap16.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EDepthMap16 operator=(
 Euresys.Open_eVision.Easy3D.EDepthMap16 other
 )
```

Parameters

other

The source EDepthMap16.

EDepthMap16.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int RowPitch
  { get; }
```

EDepthMap16.Save

Saves the EDepthMap16 object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This function saves the EDepthMap16 in a Open eVision file.
This function stores the depth map attributes.

EDepthMap16.SaveImage

Saves the EDepthMap16 image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This function saves the image associated to EDepthMap16 in a standard image file and thus does not store depth map attributes.

EDepthMap16.SaveImageAndMetadata

Saves the image and the metadata to a JSON format file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string pathImage,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

pathImage

The full path to the destination image file.

pathMetadata

The full path to the destination metadata file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

EDepthMap16.SaveJpeg

Saves the EDepthMap16 object to the given image file, in JPEG format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG quality, between 0 and 100 (100 is best quality). The default value is 75.

EDepthMap16.SaveJpeg2K

Saves the EDepthMap16 object to the given image file, in JPEG 2000 format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg2K(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG 2000 quality, between 1 and 512.
The default value is 16.

EDepthMap16.SaveMetadata

Saves the metadata to a file in JSON format

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EDepthMap16.SetBufferPtr

Sets the pointer to an externally allocated buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the image.

bitsPerRow

The total number of bits contained in a row, padding included. Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EDepthMap16::SetBufferPtr.

EDepthMap16.SetPixel

Sets the value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EDepth16 value,
 int x,
 int y
 )
```

Parameters

value

Value of the pixel.

x

Column of the pixel.

y

Row of the pixel.

EDepthMap16.SetSize

Sets the width and height of a DepthMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSize(
 int width,
 int height
 )
void SetSize(
 Euresys.Open_eVision.Easy3D.EDepthMap other
 )
```

Parameters

width

The new requested DepthMap width.

height

The new requested DepthMap height.

other

The other DepthMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new buffer (deallocate the old buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new buffer and setting its size creates a 4-byte aligned buffer, by default.

EDepthMap16.Type

Returns the image type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EImageType Type
  { get; }
```

EDepthMap16.UndefinedValue

Returns the Undefined value. That value is used to mark pixels with no valid depth value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth16 UndefinedValue
  { get; }
```

EDepthMap16.Width

Access depth map Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Width
  { get; set; }
```

EDepthMap16.ZResolution

Access the Z Resolution (depth units per grey scale value).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float ZResolution
  { get; set; }
```

4.82. EDepthMap32f Class

Represents a EDepthMap with an 32-bit pixel internal representation.

Base Class:EDepthMap

Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisSystemType	Manage the axis coordinate system.
Height	Access depth map Height.
RowPitch	Returns the buffer row pitch.
Type	Returns the image type.
UndefinedValue	Returns the Undefined value. That value is used to mark pixels with no valid depth value.
Width	Access depth map Width.
ZResolution	Access the Z Resolution (depth units per grey scale value).

Methods

AddMetadata	Adds a metadata key (name) and value. Overwrites if exists.
AsEImage	Casts the EDepthMap32f to a 32 bits gray scale image
Clear	Clears the depth map: replaces all pixels with undefined value
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Pixel coordinates.
ConvertCoordinatesPixelToMap	Converts Pixel coordinates to 3D Map coordinates.
CopyMetadataTo	Copies all metadata to another EDepthMap32f.
DeleteMetadata	Deletes an existing metadata. Throws an exception if it does not exist.
Draw	Draws a DepthMap in a device context.
DrawImage	Displays the internal image buffer
EDepthMap32f	Creates a 32 bits EDepthMap.
FillUndefinedPixels	Fills undefined pixels, used to fill the "holes" in the depth map.
FillUndefinedPixelsWithMedian	Fills undefined pixels, used to fill the "holes" in the depth map using a median rectangular kernel of odd size.
GetBufferPtr	Retrieves the pointer of the pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer of the pixel buffer.

GetMetadata	Returns string value of the given metadata. Throws an exception if it does not exist.
GetPixel	Gets the value of a pixel.
GetZValue	Gets Z value of a pixel.
IsVoid	Tests if the EDepthMap32f object has a size of zero.
Load	Restores the EDepthMap32f stored in the given Open eVision file.
LoadImage	Restores the EDepthMap32f image stored in the given image file.
LoadImageAndMetadata	Loads the image and the metadata from a file in JSON format.
LoadMetadata	Loads the metadata from a file in JSON format.
ModifyMetadata	Changes the value of an existing metadata. Throws an exception if the metadata does not exist.
operator=	Assignment operator.
Save	Saves the EDepthMap32f object to the given Open eVision file.
SaveImage	Saves the EDepthMap32f image to the given image file.
SaveImageAndMetadata	Saves the image and the metadata to a JSON format file.
SaveJpeg	Saves the EDepthMap32f object to the given image file, in JPEG format.
SaveJpeg2K	Saves the EDepthMap32f object to the given image file, in JPEG 2000 format.
SaveMetadata	Saves the metadata to a file in JSON format
SetBufferPtr	Sets the pointer to an externally allocated buffer.
SetPixel	Sets the value of a pixel.
SetSize	Sets the width and height of a DepthMap.

EDepthMap32f.AddMetadata

Adds a metadata key (name) and value. Overwrites if exists.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EDepthMap32f.AsEImage

Casts the EDepthMap32f to a 32 bits gray scale image

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EImageBW32f AsEImage(
 )
```

EDepthMap32f.AxisSystemType

Manage the axis coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.EAxisSystemType AxisSystemType
   { get; set; }
```

EDepthMap32f.Clear

Clears the depth map: replaces all pixels with undefined value

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Clear(
 )
```

EDepthMap32f.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ClearMetadata(
 )
```

EDepthMap32f.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D

The Map X coordinate.

y3D

The Map Y coordinate.

xBuffer

The returned Pixel X coordinate.

yBuffer

The returned Pixel Y coordinate.

EDepthMap32f.ConvertCoordinatesPixelToMap

Converts Pixel coordinates to 3D Map coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer
The pixel X coordinate.

yBuffer
The pixel Y coordinate.

x3D
The returned Map X coordinate.

y3D
The returned Map Y coordinate.

EDepthMap32f.CopyMetadataTo

Copies all metadata to another EDepthMap32f.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void CopyMetadataTo(
 Euresys.Open_eVision.Easy3D.EDepthMap32f other
 )
```

Parameters

other
The destination EDepthMap32f.

EDepthMap32f.DeleteMetadata

Deletes an existing metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DeleteMetadata(
 string Key
 )
```

Parameters

Key
The name of an existing metadata.

EDepthMap32f.Draw

Draws a DepthMap in a device context.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the depthmap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A DepthMap can be drawn (its pixels rendered) using a device context. EDepthMap32f::Draw takes the axis coordinate system in account. See EDepthMap32f.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap32f.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context.
EDepthMap32f::DrawImage does not takes the axis coordinate system in account. It displays the internal image buffer without flipping the axis. See EDepthMap32f::Draw method for an alternative drawing method.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap32f.EDepthMap32f

Creates a 32 bits EDepthMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EDepthMap32f(
 )

void EDepthMap32f(
 int width,
 int height
 )
```

```
void EDepthMap32f(
 Euresys.Open_eVision.Easy3D.EDepthMap32f other
 )
```

Parameters

width

The width of the new depth map.

height

The height of the new depth map.

other

Another depth map.

EDepthMap32f.FillUndefinedPixels

Fills undefined pixels, used to fill the "holes" in the depth map.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillUndefinedPixels(
 Euresys.Open_eVision.Easy3D.EDepthMap32f outMap,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

outMap

The destination depth map

direction

Direction in which the undefined pixels are filled in a depthmap from EFillUndefinedPixelsDirection.

method

Which values used to fill the undefined pixels in a depthmap from EFillUndefinedPixelsMethod.

EDepthMap32f.FillUndefinedPixelsWithMedian

Fills undefined pixels, used to fill the "holes" in the depth map using a median rectangular kernel of odd size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void FillUndefinedPixelsWithMedian(
 Euresys.Open_eVision.Easy3D.EDepthMap32f outMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

outMap

The destination depth map

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 2).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth).

EDepthMap32f.GetBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EDepthMap32f.GetCheckedBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function checks the value of the parameters.

EDepthMap32f.GetMetadata

Returns string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap32f.GetPixel

Gets the value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EDepth32f GetPixel(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap32f.GetZValue

Gets Z value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float GetZValue(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap32f.Height

Access depth map Height.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
override int Height
  { get; set; }
```

EDepthMap32f.IsVoid

Tests if the EDepthMap32f object has a size of zero.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsVoid(
 )
```

Remarks

Returns true if the depthmap size is zero.

EDepthMap32f.Load

Restores the EDepthMap32f stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path of the file.

serializer

-

Remarks

When loading, the depth map is resized if needed.
This function restores the depth map attributes.

EDepthMap32f.LoadImage

Restores the EDepthMap32f image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the depth map is resized if need be.
This function does not restore the depth map attributes, only the image associated with the EDepthMap32f is updated.

EDepthMap32f.LoadImageAndMetadata

Loads the image and the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string pathImage,
 string pathMetadata
 )
```

Parameters

pathImage

Full path to the image file.

pathMetadata

Full path to the metadata file.

EDepthMap32f.LoadMetadata

Loads the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path

Full path to the file.

EDepthMap32f.ModifyMetadata

Changes the value of an existing metadata.
Throws an exception if the metadata does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of an existing metadata.

value

The value for the given metadata.

EDepthMap32f.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EDepthMap32f operator=(
 Euresys.Open_eVision.Easy3D.EDepthMap32f other
 )
```

Parameters

other

The source EDepthMap32f.

EDepthMap32f.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int RowPitch
  { get; }
```

EDepthMap32f.Save

Saves the EDepthMap32f object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This function saves the EDepthMap32f in a Open eVision file.
This function stores the depth map attributes.

EDepthMap32f.SaveImage

Saves the EDepthMap32f image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This function saves the image associated to EDepthMap32f in a standard image file and thus does not store depth map attributes.

EDepthMap32f.SaveImageAndMetadata

Saves the image and the metadata to a JSON format file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string pathImage,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

pathImage

The full path to the destination image file.

pathMetadata

The full path to the destination metadata file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

EDepthMap32f.SaveJpeg

Saves the EDepthMap32f object to the given image file, in JPEG format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg(
 string path,
 int quality
 )
```

Parameters

path
The full path of the destination file.

quality
JPEG quality, between 0 and 100 (100 is best quality). The default value is 75.

EDepthMap32f.SaveJpeg2K

Saves the EDepthMap32f object to the given image file, in JPEG 2000 format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg2K(
 string path,
 int quality
 )
```

Parameters

path
The full path of the destination file.

quality
JPEG 2000 quality, between 1 and 512.
The default value is 16.

EDepthMap32f.SaveMetadata

Saves the metadata to a file in JSON format

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveMetadata(
 string path
 )
```

Parameters

path
The full path to the destination file.

EDepthMap32f.SetBufferPtr

Sets the pointer to an externally allocated buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the image.

bitsPerRow

The total number of bits contained in a row, padding included. Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EDepthMap32f::SetBufferPtr.

EDepthMap32f.SetPixel

Sets the value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EDepth32f value,
 int x,
 int y
 )
```

Parameters

value

Value of the pixel.

x

Column of the pixel.

y

Row of the pixel.

EDepthMap32f.SetSize

Sets the width and height of a DepthMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSize(
 int width,
 int height
 )
void SetSize(
 Euresys.Open_eVision.Easy3D.EDepthMap other
 )
```

Parameters

width

The new requested DepthMap width.

height

The new requested DepthMap height.

other

The other DepthMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new buffer (deallocate the old buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new buffer and setting its size creates a 4-byte aligned buffer, by default.

EDepthMap32f.Type

Returns the image type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EImageType Type
  { get; }
```

EDepthMap32f.UndefinedValue

Returns the Undefined value. That value is used to mark pixels with no valid depth value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth32f UndefinedValue
  { get; }
```

EDepthMap32f.Width

Access depth map Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Width
  { get; set; }
```

EDepthMap32f.ZResolution

Access the Z Resolution (depth units per grey scale value).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float ZResolution
  { get; set; }
```

4.83. EDepthMap8 Class

Represents a EDepthMap with an internal 8-bit pixel representation.

Base Class:EDepthMap
Derived Class(es):EGrabberDepthMap8
Namespace: Euresys.Open_eVision.Easy3D

Properties

AxisSystemType	Manage the axis coordinate system.
Height	Access depth map Height.
RowPitch	Returns the buffer row pitch.
Type	Returns the image type.
UndefinedValue	Returns the Undefined value. That value is used to mark pixels with no valid depth value.
Width	Access depth map Width.
ZResolution	Access the Z Resolution (depth units per grey scale value).

Methods

AddMetadata	Adds a metadata key (name) and value. Overwrites if exists.

AsEImage	Casts the EDepthMap8 to an EImageBW8 to use with the Open eVision 2D tools.
Clear	Clears the depth map: replaces all pixels with undefined value
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Pixel coordinates.
ConvertCoordinatesPixelToMap	Converts Pixel coordinates to 3D Map coordinates.
CopyMetadataTo	Copies all metadata to another EDepthMap8.
DeleteMetadata	Deletes an existing metadata. Throws an exception if it does not exist.
Draw	Draws a DepthMap in a device context.
DrawImage	Displays the internal image buffer
EDepthMap8	Creates a 8 bits EDepthMap.
FillUndefinedPixels	Fills undefined pixels, used to fill the "holes" in the depth map.
FillUndefinedPixelsWithMedian	Fills undefined pixels, used to fill the "holes" in the depth map using a median rectangular kernel of odd size.
GetBufferPtr	Retrieves the pointer of the pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer of the pixel buffer.
GetMetadata	Returns string value of the given metadata. Throws an exception if it does not exist.
GetPixel	Gets the value of a pixel.
GetZValue	Gets Z value of a pixel.
IsVoid	Tests if the EDepthMap8 object has a size of zero.
Load	Restores the EDepthMap8 stored in the given Open eVision file.
LoadImage	Restores the EDepthMap8 image stored in the given image file.
LoadImageAndMetadata	Loads the image and the metadata from a file in JSON format.
LoadMetadata	Loads the metadata from a file in JSON format.
ModifyMetadata	Changes the value of an existing metadata. Throws an exception if the metadata does not exist.
operator=	Assignment operator.
Save	Saves the EDepthMap8 object to the given Open eVision file.
SaveImage	Saves the EDepthMap8 image to the given image file.
SaveImageAndMetadata	Saves the image and the metadata to a JSON format file.
SaveJpeg	Saves the EDepthMap8 object to the given image file, in JPEG format.
SaveJpeg2K	Saves the EDepthMap8 object to the given image file, in JPEG 2000 format.

SaveMetadata	Saves the metadata to a file in JSON format
SetBufferPtr	Sets the pointer to an externally allocated buffer.
SetPixel	Sets the value of a pixel.
SetSize	Sets the width and height of a DepthMap.

EDepthMap8.AddMetadata

Adds a metadata key (name) and value. Overwrites if exists.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key
The name of the metadata. Names are unique.

value
The value for the given metadata.

EDepthMap8.AsEImage

Casts the EDepthMap8 to an EImageBW8 to use with the Open eVision 2D tools.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EImageBW8 AsEImage(
 )
```

EDepthMap8.AxisSystemType

Manage the axis coordinate system.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.EAxisSystemType AxisSystemType
  { get; set; }
```

EDepthMap8.Clear

Clears the depth map: replaces all pixels with undefined value

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Clear(
 )
```

EDepthMap8.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearMetadata(
 )
```

EDepthMap8.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D
The Map X coordinate.

y3D
The Map Y coordinate.

xBuffer
The returned Pixel X coordinate.

yBuffer
The returned Pixel Y coordinate.

EDepthMap8.ConvertCoordinatesPixelToMap

Converts Pixel coordinates to 3D Map coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer

The pixel X coordinate.

yBuffer

The pixel Y coordinate.

x3D

The returned Map X coordinate.

y3D

The returned Map Y coordinate.

EDepthMap8.CopyMetadataTo

Copies all metadata to another EDepthMap8.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void CopyMetadataTo(
 Euresys.Open_eVision.Easy3D.EDepthMap8 other
 )
```

Parameters

other

The destination EDepthMap8.

EDepthMap8.DeleteMetadata

Deletes an existing metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DeleteMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap8.Draw

Draws a DepthMap in a device context.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the depthmap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A DepthMap can be drawn (its pixels rendered) using a device context.
EDepthMap8::Draw takes the axis coordinate system in account. See EDepthMap8.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap8.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context.
EDepthMap8::DrawImage does not takes the axis coordinate system in account. It displays the internal image buffer without flipping the axis. See EDepthMap8::Draw method for an alternative drawing method.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EDepthMap8.EDepthMap8

Creates a 8 bits EDepthMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EDepthMap8(
 )
void EDepthMap8(
 int width,
 int height
 )
void EDepthMap8(
 Euresys.Open_eVision.Easy3D.EDepthMap8 other
 )
```

Parameters

width
The width of the new depth map.

height
The height of the new depth map.

other
Another depth map.

EDepthMap8.FillUndefinedPixels

Fills undefined pixels, used to fill the "holes" in the depth map.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillUndefinedPixels(
 Euresys.Open_eVision.Easy3D.EDepthMap8 outMap,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

outMap

The destination depth map.

direction

Direction in which the undefined pixels are filled in a depthmap from EFillUndefinedPixelsDirection.

method

Which values used to fill the undefined pixels in a depthmap from EFillUndefinedPixelsMethod.

EDepthMap8.FillUndefinedPixelsWithMedian

Fills undefined pixels, used to fill the "holes" in the depth map using a median rectangular kernel of odd size.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillUndefinedPixelsWithMedian(
 Euresys.Open_eVision.Easy3D.EDepthMap8 outMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

outMap

The destination depth map

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 2).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth).

EDepthMap8.GetBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EDepthMap8.GetCheckedBufferPtr

Retrieves the pointer of the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

Remarks

This function checks the value of the parameters.

EDepthMap8.GetMetadata

Returns string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EDepthMap8.GetPixel

Gets the value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth8 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap8.GetZValue

Gets Z value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float GetZValue(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel.

y

Row of the pixel.

EDepthMap8.Height

Access depth map Height.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Height
  { get; set; }
```

EDepthMap8.IsVoid

Tests if the EDepthMap8 object has a size of zero.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsVoid(
 )
```

Remarks

Returns true if the depthmap size is zero.

EDepthMap8.Load

Restores the EDepthMap8 stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path of the file.

serializer

-

Remarks

When loading, the depth map is resized if needed.
This function restores the depth map attributes.

EDepthMap8.LoadImage

Restores the EDepthMap8 image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the depth map is resized if need be.
This function does not restore the depth map attributes, only the image associated with the EDepthMap8 is updated.

EDepthMap8.LoadImageAndMetadata

Loads the image and the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string pathImage,
 string pathMetadata
 )
```

Parameters

pathImage
Full path to the image file.

pathMetadata
Full path to the metadata file.

EDepthMap8.LoadMetadata

Loads the metadata from a file in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path
Full path to the file.

EDepthMap8.ModifyMetadata

Changes the value of an existing metadata.
Throws an exception if the metadata does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key
The name of an existing metadata.

value
The value for the given metadata.

EDepthMap8.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EDepthMap8 operator=(
 Euresys.Open_eVision.Easy3D.EDepthMap8 other
 )
```

Parameters

other

The source EDepthMap8.

EDepthMap8.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int RowPitch
  { get; }
```

EDepthMap8.Save

Saves the EDepthMap8 object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This function saves the EDepthMap8 in a Open eVision file.
This function stores the depth map attributes.

EDepthMap8.SaveImage

Saves the EDepthMap8 image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This function saves the image associated to EDepthMap8 in a standard image file and thus does not store depth map attributes.

EDepthMap8.SaveImageAndMetadata

Saves the image and the metadata to a JSON format file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string pathImage,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

pathImage

The full path to the destination image file.

pathMetadata

The full path to the destination metadata file.

type

File format, as defined by EImageFileType.
If not specified, the file format is determined from the file extension.

EDepthMap8.SaveJpeg

Saves the EDepthMap8 object to the given image file, in JPEG format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG quality, between 0 and 100 (100 is best quality). The default value is 75.

EDepthMap8.SaveJpeg2K

Saves the EDepthMap8 object to the given image file, in JPEG 2000 format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveJpeg2K(
 string path,
 int quality
 )
```

Parameters

path

The full path of the destination file.

quality

JPEG 2000 quality, between 1 and 512.
The default value is 16.

EDepthMap8.SaveMetadata

Saves the metadata to a file in JSON format

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EDepthMap8.SetBufferPtr

Sets the pointer to an externally allocated buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the image.

bitsPerRow

The total number of bits contained in a row, padding included. Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EDepthMap8::SetBufferPtr.

EDepthMap8.SetPixel

Sets the value of a pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EDepth8 value,
 int x,
 int y
 )
```

Parameters

value

Value of the pixel.

x

Column of the pixel.

y

Row of the pixel.

EDepthMap8.SetSize

Sets the width and height of a DepthMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSize(
 int width,
 int height
 )
void SetSize(
 Euresys.Open_eVision.Easy3D.EDepthMap other
 )
```

Parameters

width

The new requested DepthMap width.

height

The new requested DepthMap height.

other

The other DepthMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new buffer (deallocate the old buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new buffer and setting its size creates a 4-byte aligned buffer, by default.

EDepthMap8.Type

Returns the image type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EImageType Type
  { get; }
```

EDepthMap8.UndefinedValue

Returns the Undefined value. That value is used to mark pixels with no valid depth value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth8 UndefinedValue
  { get; }
```

EDepthMap8.Width

Access depth map Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Width
  { get; set; }
```

EDepthMap8.ZResolution

Access the Z Resolution (depth units per grey scale value).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float ZResolution
  { get; set; }
```

4.84. EDepthMapToMeshConverter Class

Performs the conversion from a EDepthMap to a EMesh, using the given calibration model.
A Depth Map is a grayscale image acquired by a laser triangulation system.
The calibration model defines how to transform a pixel from the Depth Map to a world space position.
The resulting 3D representation contains a EMesh representing the surface in the world space.

Namespace: Euresys.Open_eVision.Easy3D

Properties

CalibrationModel	Access the ECalibrationModel used for conversion.

Methods

Convert	Using the ECalibrationModel, the method 'Convert' performs the conversion from a EDepthMap to a EMesh.
EDepthMapToMeshConverter	Creates an EDepthMapToMeshConverter object.
Load	Loads the converter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the converter configuration. The given ESerializer must have been created for writing.

EDepthMapToMeshConverter.CalibrationModel

Access the ECalibrationModel used for conversion.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ECalibrationModel CalibrationModel
  { get; set; }
```

EDepthMapToMeshConverter.Convert

Using the ECalibrationModel, the method 'Convert' performs the conversion from a EDepthMap to a EMesh.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap8 srcDepthMap,
 Euresys.Open_eVision.Easy3D.EMesh obj
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap16 srcDepthMap,
 Euresys.Open_eVision.Easy3D.EMesh obj
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap8 srcDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EMesh obj
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap16 srcDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EMesh obj
 )
```

Parameters

srcDepthMap
The Depth Map to convert.

obj
The destination mesh.

region
The region of interest.

EDepthMapToMeshConverter.EDepthMapToMeshConverter

Creates an EDepthMapToMeshConverter object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EDepthMapToMeshConverter(
 )
void EDepthMapToMeshConverter(
 Euresys.Open_eVision.Easy3D.EDepthMapToMeshConverter other
 )
```

Parameters

other
Another EDepthMapToMeshConverter.

EDepthMapToMeshConverter.Load

Loads the converter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EDepthMapToMeshConverter.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EDepthMapToMeshConverter operator=(
 Euresys.Open_eVision.Easy3D.EDepthMapToMeshConverter other
 )
```

Parameters

other

-

EDepthMapToMeshConverter.Save

Saves the converter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

4.85. EDepthMapToPointCloudConverter Class

Performs the conversion from a EDepthMap to a EPointCloud, using the given calibration model.
A Depth Map is a grayscale image acquired by a laser triangulation system.
The calibration model defines how to transform a pixel from the Depth Map to a world space position.
The resulting EPointCloud contains a point per defined pixel of the Depth Map.
Undefined pixels are discarded.

Namespace: Euresys.Open_eVision.Easy3D

Properties

CalibrationModel	Access the ECalibrationModel used for conversion.

Methods

Convert	Applies the ECalibrationModel to the Depth Map pixels and fill the EPointCloud with world positions.
EDepthMapToPointCloudConverter	Create a EDepthMapToPointCloudConverter.
Load	Loads the converter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the converter configuration. The given ESerializer must have been created for writing.

EDepthMapToPointCloudConverter.CalibrationModel

Access the ECalibrationModel used for conversion.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.ECalibrationModel CalibrationModel
  { get; set; }
```

EDepthMapToPointCloudConverter.Convert

Applies the ECalibrationModel to the Depth Map pixels and fill the EPointCloud with world positions.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap8 srcDepthMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap16 srcDepthMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap32f srcDepthMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap8 srcDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap16 srcDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EDepthMap32f srcDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
```

Parameters

srcDepthMap

The Depth Map to convert.

pc

The destination Point Cloud.

region

The region of interest, only pixels inside the given region are converted and added to the Point Cloud.

EDepthMapToPointCloudConverter.EDepthMapToPointCloudConverter

Create a EDepthMapToPointCloudConverter.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EDepthMapToPointCloudConverter(
 )
void EDepthMapToPointCloudConverter(
 Euresys.Open_eVision.Easy3D.EDepthMapToPointCloudConverter other
 )
```

Parameters

other

Another EDepthMapToPointCloudConverter.

EDepthMapToPointCloudConverter.Load

Loads the converter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EDepthMapToPointCloudConverter.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EDepthMapToPointCloudConverter operator=(
 Euresys.Open_eVision.Easy3D.EDepthMapToPointCloudConverter other
 )
```

Parameters

other
Another EDepthMapToPointCloudConverter.

EDepthMapToPointCloudConverter.Save

Saves the converter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.
serializer
The serializer.

4.86. EDrawableExtent Class

Drawable surface extent.

Namespace: Euresys.Open_eVision

Properties

BottomExclusive	-
Height	-

Left	-
RightExclusive	-
Top	-
Width	-

Methods

DoesContainHorizontalLine	-
DoesContainPoint	-
DoesContainRectangle	-
EDrawableExtent	-
IsInfinite	-
operator=	-

EDrawableExtent.BottomExclusive

-

Namespace: Euresys.Open_eVision

[C#]

```
int BottomExclusive
  { get; }
```

EDrawableExtent.DoesContainHorizontalLine

-

Namespace: Euresys.Open_eVision

[C#]

```
bool DoesContainHorizontalLine(
 int y,
 int x1,
 int x2
 )
```

Parameters

y

-

x1

-

x2

-

EDrawableExtent.DoesContainPoint

-

Namespace: Euresys.Open_eVision

```
[C#]
bool DoesContainPoint(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EDrawableExtent.DoesContainRectangle

-

Namespace: Euresys.Open_eVision

```
[C#]
bool DoesContainRectangle(
 int rectangleLeft,
 int rectangleTop,
 uint rectangleWidth,
 uint rectangleHeight
 )
```

Parameters

rectangleLeft

-

rectangleTop

-

rectangleWidth

-

rectangleHeight

-

EDrawableExtent.EDrawableExtent

-

Namespace: Euresys.Open_eVision

```
[C#]
void EDrawableExtent(
 )
void EDrawableExtent(
 int left,
 int top,
 uint width,
 uint height
 )
void EDrawableExtent(
 Euresys.Open_eVision.EDrawableExtent other
 )
```

Parameters

left

-

top

-

width

-

height

-

other

-

EDrawableExtent.Height

-

Namespace: Euresys.Open_eVision

[C#]

```
uint Height
  { get; }
```

EDrawableExtent.IsInfinite

-

Namespace: Euresys.Open_eVision

[C#]

```
int IsInfinite(
 )
```

EDrawableExtent.Left

-

Namespace: Euresys.Open_eVision

[C#]

```
int Left
  { get; }
```

EDrawableExtent.operator=

-

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EDrawableExtent operator=(
 Euresys.Open_eVision.EDrawableExtent other
 )
```

Parameters

other

-

EDrawableExtent.RightExclusive

-

Namespace: Euresys.Open_eVision

[C#]

```
int RightExclusive
  { get; }
```

EDrawableExtent.Top

-

Namespace: Euresys.Open_eVision

[C#]

```
int Top
  { get; }
```

EDrawableExtent.Width

-

Namespace: Euresys.Open_eVision

[C#]

```
uint Width
  { get; }
```

4.87. EDrawAdapter Class

Draw adapter interface used for drawing Open eVision objects and results.
The interface contains various primitives to draw images and various shapes (line, rectangle, ellipse, polygon). It draws the contours of shapes using a EPen and fills the inside of a shape with a EBrush. It has a default pen (EDrawAdapter::Pen) and default brush (EDrawAdapter::Brush) but they can be overridden using the optional pen and brush arguments of shape primitives. If no default pen and brush are set and no optional pen and brush are specified when calling a shape primitives, the shape will not be drawn. For the "Fill" primitives, no pen will results in no contours being drawn around the shape and no brush is equivalent to the corresponding "Draw" primitive.

Derived Class(es):EExternalDrawAdapterEGenericDrawAdapterEWindowsDrawAdapter

Namespace: Euresys.Open_eVision

Properties

Brush	Default brush.
Font	Default font.

Pen	Default pen.

Methods

Arc	Draws an arc defined by a rectangle, angle, and amplitude.
BackedText	Draws a text with a background.
DrawMask	Draws a mask with a brush.
DrawPoint	Draws a point at the given coordinate.
Ellipse	Draws an ellipse.
FilledEllipse	Fills an ellipse.
FilledPolygon	Fills a polygon.
FilledRectangle	Fills a rectangle.
FilledRotatedEllipse	Fills a rotated ellipse.
GetTextSize	Size of the given text using the default font (EDrawAdapter::Font).
Image	Draws an image.
Line	Draws a line between two points.
Polygon	Draws a polygon.
Rectangle	Draws a rectangle.
RotatedEllipse	Draws a rotated ellipse.
Text	Draws a text.
UseCurrentBrush	Use the current pen set in the drawing framework.
UseCurrentPen	Use the current pen set in the drawing framework.

EDrawAdapter.Arc

Draws an arc defined by a rectangle, angle, and amplitude.

Namespace: Euresys.Open_eVision

[C#]

```
void Arc(
 int orgX,
 int orgY,
 int width,
 int height,
 float startAngle,
 float amplitude,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

startAngle
Starting angle of the arc in radians

amplitude
Amplitude of the arc in radians

pen
Optional pen to use

EDrawAdapter.BackedText

Draws a text with a background.

Namespace: Euresys.Open_eVision

[C#]

```
void BackedText(
 string text,
 int x,
 int y,
 Euresys.Open_eVision.EBrush textBrush,
 Euresys.Open_eVision.EBrush backgroundBrush
 )
void BackedText(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush,
 Euresys.Open_eVision.EBrush backgroundBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

textBrush
Optional brush to use for the color of the text.

backgroundBrush
Optional brush to use for the background.

orientation
Orientation of the text.

EDrawAdapter.Brush

Default brush.

Namespace: Euresys.Open_eVision

```
[C#]
virtual Euresys.Open_eVision.EBrush Brush
  { get; set; }
```

EDrawAdapter.DrawMask

Draws a mask with a brush.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawMask(
 Euresys.Open_eVision.EBaseROI mask,
 Euresys.Open_eVision.EBrush brush
 )
void DrawMask(
 Euresys.Open_eVision.EBaseROI mask,
 float orgX,
 float orgY,
 float width,
 float height,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

mask
Mask to draw

brush
Brush to draw the mask with.

orgX
X coordinate of the point where to draw the image.

orgY
Y coordinate of the point where to draw the image.

width
Width of the destination rectangle in which to draw the image.

height
Height of the destination rectangle in which to draw the image.

Remarks

The type of the mask iamge must be BW8, BW16, or BW32.
The default implentation converts the mask into a EImageC24A image using the brush and draws this image.

EDrawAdapter.DrawPoint

Draws a point at the given coordinate.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawPoint(
 int x1,
 int y1,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate

y1
Y coordinate

pen
Optional pen to use

EDrawAdapter.Ellipse

Draws an ellipse.

Namespace: Euresys.Open_eVision

[C#]

```
void Ellipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle containing the ellipse

orgY
Y origin of the rectangle containing the ellipse

width
Width of the rectangle containing the ellipse

height
Height of the rectangle containing the ellipse

pen
Optional pen to use

EDrawAdapter.FilledEllipse

Fills an ellipse.

Namespace: Euresys.Open_eVision

[C#]

```
void FilledEllipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
X origin of the rectangle containing the ellipse

orgY
Y origin of the rectangle containing the ellipse

width
Width of the rectangle containing the ellipse

height
Height of the rectangle containing the ellipse

pen
Optional pen to use for drawing the contour of the ellipse

brush
Optional pen to use for drawing the inside of the ellipse

EDrawAdapter.FilledPolygon

Fills a polygon.

Namespace: Euresys.Open_eVision

[C#]

```
void FilledPolygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
void FilledPolygon(
 Euresys.Open_eVision.EPolygon polygon,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

points
Points of the polygon

pen
Optional pen to use for drawing the contour of the polygon

brush
Optional pen to use for drawing the inside of the polygon

polygon
Polygon

EDrawAdapter.FilledRectangle

Fills a rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledRectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

pen
Optional pen to use for drawing the contour of the rectangle

brush
Optional brush to use for filling the inside of the rectangle

EDrawAdapter.FilledRotatedEllipse

Fills a rotated ellipse.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledRotatedEllipse(
 float centerX,
 float centerY,
 float radianAngle,
 float longAxis,
 float shortAxis,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

centerX
X coordinate of the ellipse center
centerY
Y coordinate of the ellipse center
radianAngle
Angle of the rotated ellipse in radian
longAxis
Long axis length
shortAxis
Short axis length
pen
Pen to draw the ellipse with.
brush
-

Remarks

A default implementation based on EDrawAdapter already exists.

EDrawAdapter.Font

Default font.

Namespace: Euresys.Open_eVision

```
[C#]
virtual Euresys.Open_eVision.EFont Font
  { get; set; }
```

EDrawAdapter.GetTextSize

Size of the given text using the default font (EDrawAdapter::Font).

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetTextSize(
 string text
 )
```

Parameters

text
Text

EDrawAdapter.Image

Draws an image.

Namespace: Euresys.Open_eVision

[C#]

```
void Image(
 Euresys.Open_eVision.EBaseROI image
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EBW8Vector pColorScale
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EC24Vector pColorScale
 )

void Image(
 Euresys.Open_eVision.EBaseROI image,
 float orgX,
 float orgY,
 float width,
 float height
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EC24Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EBW8Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )
```

Parameters

image
Image.
pColorScale
Color scale to draw a grayscale image with.
orgX
X coordinate of the point where to draw the image.
orgY
Y coordinate of the point where to draw the image.
width
Width of the destination rectangle in which to draw the image.
height
Height of the destination rectangle in which to draw the image.

EDrawAdapter.Line

Draws a line between two points.

Namespace: Euresys.Open_eVision

[C#]

```
void Line(
 int x1,
 int y1,
 int x2,
 int y2,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate of line origin point
y1
Y coordinate of line origin point
x2
X coordinate of line end point
y2
Y coordinate of line end point
pen
Optional pen to use

EDrawAdapter.Pen

Default pen.

Namespace: Euresys.Open_eVision

[C#]

```
virtual Euresys.Open_eVision.EPen Pen
  { get; set; }
```

EDrawAdapter.Polygon

Draws a polygon.

Namespace: Euresys.Open_eVision

[C#]

```
void Polygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen
 )
void Polygon(
 Euresys.Open_eVision.EPolygon polygon,
 Euresys.Open_eVision.EPen arg1
 )
```

Parameters

points

Points of the polygon

pen

Optional pen to use

polygon

Polygon

arg1

-

EDrawAdapter.Rectangle

Draws a rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void Rectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle
orgY
Y origin of the rectangle
width
Width of the rectangle
height
Height of the rectangle
pen
Optional pen to use

EDrawAdapter.RotatedEllipse

Draws a rotated ellipse.

Namespace: Euresys.Open_eVision

```
[C#]
void RotatedEllipse(
 float centerX,
 float centerY,
 float radianAngle,
 float longAxis,
 float shortAxis,
 bool drawDiagonals,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

centerX
X coordinate of the ellipse center
centerY
Y coordinate of the ellipse center
radianAngle
Angle of the rotated ellipse in radian
longAxis
Long axis length
shortAxis
Short axis length
drawDiagonals
Whether to draw the diagonal
pen
Pen to draw the ellipse with.

Remarks

A default implementation based on EDrawAdapter already exists.

EDrawAdapter.Text

Draws a text.

Namespace: Euresys.Open_eVision

```
[C#]
void Text(
 string text,
 int x,
 int y,
 Euresys.Open_eVision.EBrush textBrush
 )
void Text(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

textBrush
Optional brush to use for the color of the text.

orientation
Orientation of the text in radians.

EDrawAdapter.UseCurrentBrush

Use the current pen set in the drawing framework.

Namespace: Euresys.Open_eVision

```
[C#]
void UseCurrentBrush(
 )
```

EDrawAdapter.UseCurrentPen

Use the current pen set in the drawing framework.

Namespace: Euresys.Open_eVision

```
[C#]
void UseCurrentPen(
 )
```

4.88. EEllipseRegion Class

Manages a complete context for an ERegion shaped like an ellipse.

Base Class:ERegion

Namespace: Euresys.Open_eVision

Properties

Angle	Angle of the region
Center	Center of the region
HorizontalRadius	Horizontal radius of the region
VerticalRadius	Vertical radius of the region

Methods

Drag	Moves the specified handle to a new position and updates all placement parameters of the region.
EEllipseRegion	Constructs an EEllipseRegion context.
HitTest	Detects if the cursor is placed over one of the dragging handles.
Load	Loads the EEllipseRegion. The given ESerializer must have been created for reading.
operator!=	Checks if this EEllipseRegion instance is not strictly equal to another
operator=	Assignment operator.
operator==	Checks if this EEllipseRegion instance is strictly equal to another
Rotate	Creates a new EEllipseRegion by rotating the EEllipseRegion.
Save	Saves the EEllipseRegion. The given ESerializer must have been created for writing.
Scale	Creates a new EEllipseRegion by scaling the EEllipseRegion.
Translate	Creates a new EEllipseRegion by translating the EEllipseRegion.

EEllipseRegion.Angle

Angle of the region

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

EEllipseRegion.Center

Center of the region

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

EEllipseRegion.Drag

Moves the specified handle to a new position and updates all placement parameters of the region.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with EEllipseRegion::HitTest and EEllipseRegion::Drag.

EEllipseRegion.EEllipseRegion

Constructs an EEllipseRegion context.

Namespace: Euresys.Open_eVision

[C#]

```
void EEllipseRegion(
 )

void EEllipseRegion(
 float centerX,
 float centerY,
 float radius1,
 float radius2,
 float angle
 )

void EEllipseRegion(
 Euresys.Open_eVision.EPoint center,
 float radius1,
 float radius2,
 float angle
 )

void EEllipseRegion(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint axisEnd1,
 Euresys.Open_eVision.EPoint axisEnd2
 )
```

```
void EEllipseRegion(
 Euresys.Open_eVision.EPoint pt1,
 Euresys.Open_eVision.EPoint pt2,
 Euresys.Open_eVision.EPoint pt3,
 Euresys.Open_eVision.EPoint pt4,
 Euresys.Open_eVision.EPoint pt5
 )
void EEllipseRegion(
 Euresys.Open_eVision.EEllipseRegion other
 )
```

Parameters

centerX
The abscissa of the center of the EEllipseRegion.

centerY
The ordinate of the center of the EEllipseRegion.

radius1
The abscissa radius of the non rotated EEllipseRegion.

radius2
The ordinate radius of the non rotated EEllipseRegion.

angle
The angle of the rotated EEllipseRegion.

center
The center of the EEllipseRegion.

axisEnd1
The point corresponding to the end of the abscissa axis of the non rotated EEllipseRegion.

axisEnd2
The point corresponding to the end of the ordinate axis of the non rotated EEllipseRegion.

pt1
One of the five points defining the EEllipseRegion.

pt2
One of the five points defining the EEllipseRegion.

pt3
One of the five points defining the EEllipseRegion.

pt4
One of the five points defining the EEllipseRegion.

pt5
One of the five points defining the EEllipseRegion.

other
EEllipseRegion context to copy.

Remarks

When defining an EEllipseRegion, the two resulting radius values must not be 0 else an Parameter3OutOfRange or EError is thrown.
When defining an EEllipseRegion, the two resulting radius valued must be small enough so that the region fit in memory.
When defining an EEllipseRegion with two axis ends, the two axis ends and the center must not all lie on the same straight line else an EError is thrown.
When defining an EEllipseRegion with five points, no more than two of the points should lie on the same straight line else an EError is thrown.

EEllipseRegion.HitTest

Detects if the cursor is placed over one of the dragging handles.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EEditionMode HitTest(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x
x-coordinate of the mouse cursor.

y
y-coordinate of the mouse cursor.

zoomX
Horizontal zoom factor. By default, true scale is used.

zoomY
Vertical zoom factor. By default, true scale is used.

panX
Horizontal pan offset. By default, no pan is added.

panY
Vertical pan offset. By default, no pan is added.

Remarks

Returns a handle identifier, as defined by EEditionMode.
If zooming and/or panning were used when drawing the region, the same values must be used with EEllipseRegion::HitTest and EEllipseRegion::Drag.

EEllipseRegion.HorizontalRadius

Horizontal radius of the region

Namespace: Euresys.Open_eVision

[C#]

```
float HorizontalRadius
  { get; set; }
```

EEllipseRegion.Load

Loads the EEllipseRegion. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EEllipseRegion.operator!=

Checks if this EEllipseRegion instance is not strictly equal to another

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EEllipseRegion other
 )
```

Parameters

other
Reference to the other EEllipseRegion instance

EEllipseRegion.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EEllipseRegion operator=(
 Euresys.Open_eVision.EEllipseRegion other
 )
```

Parameters

other

Reference to the EEllipseRegion used for the assignment

EEllipseRegion.operator==

Checks if this EEllipseRegion instance is strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EEllipseRegion other
 )
```

Parameters

other

Reference to the other EEllipseRegion instance

EEllipseRegion.Rotate

Creates a new EEllipseRegion by rotating the EEllipseRegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EEllipseRegion Rotate(
 float angle
 )
```

Parameters

angle

Rotation angle

EEllipseRegion.Save

Saves the EEllipseRegion. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

EEllipseRegion.Scale

Creates a new EEllipseRegion by scaling the EEllipseRegion.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EEllipseRegion Scale(
 float scale
 )

Euresys.Open_eVision.EEllipseRegion Scale(
 float scaleX,
 float scaleY
 )
```

Parameters

scale
Isotropic scale

scaleX
Horizontal scale

scaleY
Vertical scale

EEllipseRegion.Translate

Creates a new EEllipseRegion by translating the EEllipseRegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EEllipseRegion Translate(
 float dx,
 float dy
 )
```

Parameters

dx

Horizontal translation in pixel value

dy

Vertical translation in pixel value

EEllipseRegion.VerticalRadius

Vertical radius of the region

Namespace: Euresys.Open_eVision

```
[C#]
float VerticalRadius
  { get; set; }
```

4.89. EErrorStatistics Class

This object contains the error statistics (deviation between model and aligned points).

Namespace: Euresys.Open_eVision.Easy3D

Properties

Max	Gets/Sets the maximum error (calculated on the valid samples).
Mean	Gets/Sets the mean error (calculated on the valid samples).
Min	Gets/Sets the minimum error (calculated on the valid samples).
NumOfErrors	Gets/Sets the number of errors (samples not found) which is the number of samples on which no error could be calculated.
NumOfValidSamples	Gets/Sets the number of valid samples which is the number of samples on which the error is calculated.

StdDev	Gets/Sets the standard deviation error (calculated on the valid samples).

Methods

EErrorStatistics	Creates a EErrorStatistics object.
Load	Loads a EErrorStatistics. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves a EErrorStatistics. The given ESerializer must have been created for writing.

EErrorStatistics.EErrorStatistics

Creates a EErrorStatistics object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EErrorStatistics(
 )
void EErrorStatistics(
 Euresys.Open_eVision.Easy3D.EErrorStatistics other
 )
```

Parameters

other

Reference used for the initialization.

EErrorStatistics.Load

Loads a EErrorStatistics. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EErrorStatistics.Max

Gets/Sets the maximum error (calculated on the valid samples).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Max
  { get; set; }
```

EErrorStatistics.Mean

Gets/Sets the mean error (calculated on the valid samples).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Mean
  { get; set; }
```

EErrorStatistics.Min

Gets/Sets the minimum error (calculated on the valid samples).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Min
  { get; set; }
```

EErrorStatistics.NumOfErrors

Gets/Sets the number of errors (samples not found) which is the number of samples on which no error could be calculated.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumOfErrors
  { get; set; }
```

EErrorStatistics.NumOfValidSamples

Gets/Sets the number of valid samples which is the number of samples on which the error is calculated.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumOfValidSamples
  { get; set; }
```

EErrorStatistics.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EErrorStatistics operator=(
 Euresys.Open_eVision.Easy3D.EErrorStatistics other
 )
```

Parameters

other

-

EErrorStatistics.Save

Saves a EErrorStatistics. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EErrorStatistics.StdDev

Gets/Sets the standard deviation error (calculated on the valid samples).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float StdDev
  { get; set; }
```

4.90. EException Class

Holds the exception information, that is the code and the description of the error that has thrown the exception.

Remarks

Each time an Open eVision error occurs, an exception is thrown. Exceptions feature an error code and a description. To catch a potentially arising exception, the function call is included in a try-catch block.

Namespace: Euresys.Open_eVision

Properties

Error	Code of the error that has thrown the exception.

Methods

EException	Constructs a EException object.
operator=	Assignment operator.
What	Returns the description of the error that has thrown the exception.

EException.EException

Constructs a EException object.

Namespace: Euresys.Open_eVision

[C#]

```
void EException(
 Euresys.Open_eVision.EError error,
 string message
 )
void EException(
 Euresys.Open_eVision.EException other
 )
void EException(
 string message
 )
```

Parameters

error

The EError to construct the exception from.

message

A string to construct the exception from.

other

-

EException.Error

Code of the error that has thrown the exception.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EError Error
  { get; set; }
```

EException.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EException operator=(
 Euresys.Open_eVision.EException other
 )
```

Parameters

other

-

EException.What

Returns the description of the error that has thrown the exception.

Namespace: Euresys.Open_eVision

```
[C#]
string What(
 )
```

4.91. EExplicitGeometricCalibrationModel Class

EExplicitGeometricCalibrationModel is used to calibrate a depth map from a minimal set of explicit geometric values.
All model parameters are given to the EExplicitGeometricCalibrationModel constructor.

Base Class:ECalibrationModel

Namespace: Euresys.Open_eVision.Easy3D

Properties

CameraAngle	Camera view angle.
CameraHeight	The height from the camera optical center to the object reference plane (assuming the reference plane is projected in the center line of the image), in mm.
FocalLength	Camera focal length.
LaserPlaneAngle	Laser plane angle.
MotionIncrement	Motion increment (Distance between each line of the depth map).
RoiBottomLine	The ROI bottom line used in laser line extraction.
RoiLeftColumn	The ROI left column used in laser line extraction.
SensorHeight	Camera sensor height.
SensorWidth	Camera sensor width.
SensorXResolution	Camera X resolution.
SensorYResolution	Camera Y resolution.
Type	Returns the type of calibration model, see ECalibrationType.

Methods

EExplicitGeometricCalibrationModel	Constructs a EExplicitGeometricCalibrationModel. EExplicitGeometricCalibrationModel is used to calibrate a depth map from a minimal set of explicit geometric values.
IsInitialized	Returns true if the model has been correctly initialized.

Load	Loads the EExplicitGeometricCalibrationModel. The given ESerializer must have been created for reading.
operator=	Assignment operator.
operator==	Comparison operator.
Save	Saves the EExplicitGeometricCalibrationModel. The given ESerializer must have been created for writing.

EExplicitGeometricCalibrationModel.CameraAngle

Camera view angle.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float CameraAngle
  { get; }
```

EExplicitGeometricCalibrationModel.CameraHeight

The height from the camera optical center to the object reference plane (assuming the reference plane is projected in the center line of the image), in mm.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float CameraHeight
  { get; }
```

EExplicitGeometricCalibrationModel.EExplicitGeometricCalibrationModel

Constructs a EExplicitGeometricCalibrationModel. EExplicitGeometricCalibrationModel is used to calibrate a depth map from a minimal set of explicit geometric values.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EExplicitGeometricCalibrationModel(
 )
```

```
void EExplicitGeometricCalibrationModel(
 float sensorWidth,
 float sensorHeight,
 int sensorXResolution,
 int sensorYResolution,
 int roiLeftColumn,
 int roiBottomLine,
 float focalLength,
 float cameraAngle,
 float cameraHeight,
 float laserPlaneAngle,
 float motionIncrement
 )
void EExplicitGeometricCalibrationModel(
 Euresys.Open_eVision.Easy3D.EExplicitGeometricCalibrationModel other
 )
```

Parameters

sensorWidth

The camera sensor width, in mm.

sensorHeight

The camera sensor height, in mm.

sensorXResolution

The camera X resolution (pixel count in width).

sensorYResolution

The camera Y resolution (pixel count in height).

roiLeftColumn

The ROI left column used in laser line extraction.
Between the left (0) and the right (width) of the image.

roiBottomLine

The ROI bottom line used in laser line extraction.
Between the top (0) and the bottom (height) of the image. That's the depth map values origin.

focalLength

The camera optics focal length, in mm.

cameraAngle

The camera angle from the vertical axis.
Looking down camera is angle 0 and positive in counter clockwise direction. Valid values are between 0 (vertical orientation) and lower that 90 degrees (horizontal orientation).

cameraHeight

The height from the camera optical center to the object reference plane (assuming the reference plane is projected in the center line of the image), in mm.

laserPlaneAngle

The laser plane angle from the vertical axis.
A perfect vertical laser orientation is angle 0 and negative in clockwise direction. Valid values for laser angle are between -90 degrees (excluded) and +90 degrees (excluded).

motionIncrement

The distance in mm between each line of the depth map.
That's the relative motion of the camera/laser setup to the object position.

other

Another EExplicitGeometricCalibrationModel.

EExplicitGeometricCalibrationModel.FocalLength

Camera focal length.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float FocalLength
  { get; }
```

EExplicitGeometricCalibrationModel.IsInitialized

Returns true if the model has been correctly initialized.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsInitialized(
 )
```

EExplicitGeometricCalibrationModel.LaserPlaneAngle

Laser plane angle.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float LaserPlaneAngle
  { get; }
```

EExplicitGeometricCalibrationModel.Load

Loads the EExplicitGeometricCalibrationModel. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EExplicitGeometricCalibrationModel.MotionIncrement

Motion increment (Distance between each line of the depth map).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MotionIncrement
  { get; }
```

EExplicitGeometricCalibrationModel.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EExplicitGeometricCalibrationModel operator=(
 Euresys.Open_eVision.Easy3D.EExplicitGeometricCalibrationModel other
 )
```

Parameters

other
Another EExplicitGeometricCalibrationModel.

EExplicitGeometricCalibrationModel.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator==(
 Euresys.Open_eVision.Easy3D.EExplicitGeometricCalibrationModel other
 )
```

Parameters

other

The other EExplicitGeometricCalibrationModel.

EExplicitGeometricCalibrationModel.RoiBottomLine

The ROI bottom line used in laser line extraction.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int RoiBottomLine
  { get; }
```

EExplicitGeometricCalibrationModel.RoiLeftColumn

The ROI left column used in laser line extraction.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int RoiLeftColumn
  { get; }
```

EExplicitGeometricCalibrationModel.Save

Saves the EExplicitGeometricCalibrationModel. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EExplicitGeometricCalibrationModel.SensorHeight

Camera sensor height.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float SensorHeight
  { get; }
```

EExplicitGeometricCalibrationModel.SensorWidth

Camera sensor width.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float SensorWidth
  { get; }
```

EExplicitGeometricCalibrationModel.SensorXResolution

Camera X resolution.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int SensorXResolution
  { get; }
```

EExplicitGeometricCalibrationModel.SensorYResolution

Camera Y resolution.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
int SensorYResolution
  { get; }
```

EExplicitGeometricCalibrationModel.Type

Returns the type of calibration model, see ECalibrationType.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.ECalibrationType Type
  { get; }
```

4.92. EExternalDrawAdapter Class

-

Base Class:EDrawAdapter
Namespace: Euresys.Open_eVision

Properties

ArcFunctionPtr	-
BackedTextFunctionPtr	-
Brush	Default brush.
DrawPointFunctionPtr	-
EllipseFunctionPtr	-
Extent	Extent of the underlying surface being drawn on.
FillEllipseFunctionPtr	-
FillPolygonFunctionPtr	-
FillRectangleFunctionPtr	-
Font	Default font.
GetExtentFunctionPtr	-
GetTextSizeFunctionPtr	-
ImageFunctionPtr	-
ImageWithColorScaleFunctionPtr	-

ImageWithGrayscaleScaleFunctionPtr	-
LineFunctionPtr	-
Pen	Default pen.
PolygonFunctionPtr	-
RectangleFunctionPtr	-
SetBrushFunctionPtr	-
SetFontFunctionPtr	-
SetPenFunctionPtr	-
TextFunctionPtr	-
UseCurrentBrushFunctionPtr	-
UseCurrentPenFunctionPtr	-

Methods

Arc	Draws an arc defined by a rectangle, angle, and amplitude.
BackedText	Draws a text with a background.
DrawPoint	Draws a point at the given coordinate.
EExternalDrawAdapter	-
Ellipse	Draws an ellipse.
FilledEllipse	Fills an ellipse.
FilledPolygon	Fills a polygon.
FilledRectangle	Fills a rectangle.
GetTextSize	Size of the given text using the default font (EExternalDrawAdapter::Font).
Image	Draws an image.
Line	Draws a line between two points.
operator=	-
Polygon	Draws a polygon.
Rectangle	Draws a rectangle.
Text	Draws a text.
UseCurrentBrush	Use the current pen set in the drawing framework.
UseCurrentPen	Use the current pen set in the drawing framework.

EExternalDrawAdapter.Arc

Draws an arc defined by a rectangle, angle, and amplitude.

Namespace: Euresys.Open_eVision

```
[C#]
void Arc(
 int orgX,
 int orgY,
 int width,
 int height,
 float startAngle,
 float amplitude,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

startAngle
Starting angle of the arc in radians

amplitude
Amplitude of the arc in radians

pen
Optional pen to use

EExternalDrawAdapter.ArcFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr ArcFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.BackedText

Draws a text with a background.

Namespace: Euresys.Open_eVision

```
[C#]
void BackedText(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush,
 Euresys.Open_eVision.EBrush backgroundBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

orientation
Orientation of the text.

textBrush
Optional brush to use for the color of the text.

backgroundBrush
Optional brush to use for the background.

EExternalDrawAdapter.BackedTextFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr BackedTextFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Brush

Default brush.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EBrush Brush
  { get; set; }
```

EExternalDrawAdapter.DrawPoint

Draws a point at the given coordinate.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawPoint(
 int x1,
 int y1,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1

X coordinate

y1

Y coordinate

pen

Optional pen to use

EExternalDrawAdapter.DrawPointFunctionPtr

-

Namespace: Euresys.Open_eVision

[C#]

```
static IntPtr DrawPointFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.EExternalDrawAdapter

-

Namespace: Euresys.Open_eVision

```
[C#]
void EExternalDrawAdapter(
 IntPtr adapter
 )
void EExternalDrawAdapter(
 Euresys.Open_eVision.EExternalDrawAdapter other
 )
```

Parameters

adapter

-

other

-

EExternalDrawAdapter.Ellipse

Draws an ellipse.

Namespace: Euresys.Open_eVision

```
[C#]
void Ellipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX

X origin of the rectangle containing the ellipse

orgY

Y origin of the rectangle containing the ellipse

width

Width of the rectangle containing the ellipse

height

Height of the rectangle containing the ellipse

pen

Optional pen to use

EExternalDrawAdapter.EllipseFunctionPtr

-

Namespace: Euresys.Open_eVision

[C#]

```
static IntPtr EllipseFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Extent

Extent of the underlying surface being drawn on.

Namespace: Euresys.Open_eVision

[C#]

```
virtual Euresys.Open_eVision.EDrawableExtent Extent
  { get; }
```

EExternalDrawAdapter.FilledEllipse

Fills an ellipse.

Namespace: Euresys.Open_eVision

[C#]

```
void FilledEllipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
: X origin of the rectangle containing the ellipse

orgY
: Y origin of the rectangle containing the ellipse

width
: Width of the rectangle containing the ellipse

height
: Height of the rectangle containing the ellipse

pen
: Optional pen to use for drawing the contour of the ellipse

brush
: Optional pen to use for drawing the inside of the ellipse

EExternalDrawAdapter.FilledPolygon

Fills a polygon.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledPolygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

points

Points of the polygon

pen

Optional pen to use for drawing the contour of the polygon

brush

Optional pen to use for drawing the inside of the polygon

EExternalDrawAdapter.FilledRectangle

Fills a rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledRectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

pen
Optional pen to use for drawing the contour of the rectangle

brush
Optional brush to use for filling the inside of the rectangle

EExternalDrawAdapter.FillEllipseFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr FillEllipseFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.FillPolygonFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr FillPolygonFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.FillRectangleFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr FillRectangleFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Font

Default font.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EFont Font
  { get; set; }
```

EExternalDrawAdapter.GetExtentFunctionPtr

-

Namespace: Euresys.Open_eVision

[C#]

```
static IntPtr GetExtentFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.GetTextSize

Size of the given text using the default font (EExternalDrawAdapter::Font).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetTextSize(
 string text
 )
```

Parameters

text
Text

EExternalDrawAdapter.GetTextSizeFunctionPtr

-

Namespace: Euresys.Open_eVision

[C#]

```
static IntPtr GetTextSizeFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Image

Draws an image.

Namespace: Euresys.Open_eVision

```
[C#]
void Image(
 Euresys.Open_eVision.EBaseROI image,
 float orgX,
 float orgY,
 float width,
 float height
 )
void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EC24Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )
void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EBW8Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )
```

Parameters

image
Image.

orgX
X coordinate of the point where to draw the image.

orgY
Y coordinate of the point where to draw the image.

width
Width of the destination rectangle in which to draw the image.

height
Height of the destination rectangle in which to draw the image.

pColorScale
Color scale to draw a grayscale image with.

EExternalDrawAdapter.ImageFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr ImageFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.ImageWithColorScaleFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr ImageWithColorScaleFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.ImageWithGrayscaleScaleFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr ImageWithGrayscaleScaleFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Line

Draws a line between two points.

Namespace: Euresys.Open_eVision

```
[C#]
void Line(
 int x1,
 int y1,
 int x2,
 int y2,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate of line origin point

y1
Y coordinate of line origin point

x2
X coordinate of line end point

y2
Y coordinate of line end point

pen
Optional pen to use

EExternalDrawAdapter.LineFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr LineFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.operator=

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EExternalDrawAdapter operator=(
 Euresys.Open_eVision.EExternalDrawAdapter other
 )
```

Parameters

other
-

EExternalDrawAdapter.Pen

Default pen.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EPen Pen
  { get; set; }
```

EExternalDrawAdapter.Polygon

Draws a polygon.

Namespace: Euresys.Open_eVision

```
[C#]
void Polygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

points

Points of the polygon

pen

Optional pen to use

EExternalDrawAdapter.PolygonFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr PolygonFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Rectangle

Draws a rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void Rectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

pen
Optional pen to use

EExternalDrawAdapter.RectangleFunctionPtr

-

Namespace: Euresys.Open_eVision

[C#]

```
static IntPtr RectangleFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.SetBrushFunctionPtr

-

Namespace: Euresys.Open_eVision

[C#]

```
static IntPtr SetBrushFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.SetFontFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr SetFontFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.SetPenFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr SetPenFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.Text

Draws a text.

Namespace: Euresys.Open_eVision

```
[C#]
void Text(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush
 )
```

Parameters

text
: Text to draw.

x
: X position of the text.

y
: Y position of the text.

orientation
: Orientation of the text in radians.

textBrush
: Optional brush to use for the color of the text.

EExternalDrawAdapter.TextFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr TextFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.UseCurrentBrush

Use the current pen set in the drawing framework.

Namespace: Euresys.Open_eVision

```
[C#]
void UseCurrentBrush(
 )
```

EExternalDrawAdapter.UseCurrentBrushFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr UseCurrentBrushFunctionPtr
  { get; set; }
```

EExternalDrawAdapter.UseCurrentPen

Use the current pen set in the drawing framework.

Namespace: Euresys.Open_eVision

```
[C#]
void UseCurrentPen(
 )
```

EExternalDrawAdapter.UseCurrentPenFunctionPtr

-

Namespace: Euresys.Open_eVision

```
[C#]
static IntPtr UseCurrentPenFunctionPtr
  { get; set; }
```

4.93. EFeaturesAligner Class

Alignment class, used to calculate the best transformation between matching pairs of points.
The object EFeaturesAligner contains a list of points called the 'Model points list'.
The method EFeaturesAligner::Compute takes a second list of points as argument which is called the 'Measured points list' and produces a E3DTransformMatrix as result.

Namespace: Euresys.Open_eVision.Easy3D

Properties

ModelPoints	Sets/Gets the model points list. The model point list is a list of points that is used either as source or as destination of the transformation to calculate. The model points list should at least contain 3 unaligned points.
PolarityTransform	Sets/Gets the polarity of the transformation from EAlignmentPolarity.

Methods

Compute	Computes the best transformation matrix for a given Measured points list. This will compute the best transformation for the alignment between the Measured points and the Model points.
EFeaturesAligner	Creates a EFeaturesAligner object.
Load	Loads the EFeaturesAligner object configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the EFeaturesAligner object configuration. The given ESerializer must have been created for writing.

EFeaturesAligner.Compute

Computes the best transformation matrix for a given Measured points list.
This will compute the best transformation for the alignment between the Measured points and the Model points.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Compute(
 Euresys.Open_eVision.Easy3D.E3DPoint[] measuredPoints
 )
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Compute(
 Euresys.Open_eVision.Easy3D.E3DPoint[] measuredPoints,
 Euresys.Open_eVision.Easy3D.EErrorStatistics errorStatistics
 )
```

Parameters

measuredPoints

The measured points list; the measured points list should at least contain 3 unaligned points.

errorStatistics

Optional parameter passed by reference. This object will contains the error statistics (deviation between model and aligned points).

EFeaturesAligner.EFeaturesAligner

Creates a EFeaturesAligner object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EFeaturesAligner(
 )
void EFeaturesAligner(
 Euresys.Open_eVision.Easy3D.EFeaturesAligner other
 )
```

Parameters

other

Reference to the object used for the initialization.

EFeaturesAligner.Load

Loads the EFeaturesAligner object configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
```

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EFeaturesAligner.ModelPoints

Sets/Gets the model points list.
The model point list is a list of points that is used either as source or as destination of the transformation to calculate.
The model points list should at least contain 3 unaligned points.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint[] ModelPoints
  { get; set; }
```

EFeaturesAligner.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EFeaturesAligner operator=(
 Euresys.Open_eVision.Easy3D.EFeaturesAligner other
 )
```

Parameters

other

-

EFeaturesAligner.PolarityTransform

Sets/Gets the polarity of the transformation from EAlignmentPolarity.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EAlignmentPolarity PolarityTransform
  { get; set; }
```

Remarks

If polarity is ModelToMeasured, calculates the best transformation from the Model points list to the Measured points list (default).
If the polarity is MeasuredToModel, calculates the best transformation from the Measured points list to the Model points list.

EFeaturesAligner.Save

Saves the EFeaturesAligner object configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

4.94. EFilePointerSerializer Class

Abstract interface for file-like objects.

Base Class:ESerializer

Namespace: Euresys.Open_eVision

Properties

Writing	Returns true if the ESerializer object has been created for writing and false otherwise.

Methods

Close	Closes the file associated with the ESerializer object.

EFilePointerSerializer.Close

Closes the file associated with the ESerializer object.

Namespace: Euresys.Open_eVision

```
[C#]
void Close(
 )
```

EFilePointerSerializer.Writing

Returns true if the ESerializer object has been created for writing and false otherwise.

Namespace: Euresys.Open_eVision

```
[C#]
override bool Writing
   { get; }
```

4.95. EFileSerializer Class

Abstract interface for file-like objects.

Base Class:ESerializer

Namespace: Euresys.Open_eVision

Properties

Writing	Returns true if the ESerializer object has been created for writing and false otherwise.

Methods

Close	Closes the file associated with the ESerializer object.

EFileSerializer.Close

Closes the file associated with the ESerializer object.

Namespace: Euresys.Open_eVision

```
[C#]
void Close(
 )
```

EFileSerializer.Writing

Returns true if the ESerializer object has been created for writing and false otherwise.

Namespace: Euresys.Open_eVision

```
[C#]
override bool Writing
   { get; }
```

4.96. EFilters Class

Filtering functions used to remove noise on 3D containers.

Namespace: Euresys.Open_eVision.Easy3D

Methods

Median	In a EDepthMap or EZMap, removes noisy pixels by using a median filter. The median filter may ignore undefined values or not. In the first case, defined pixels remain defined and undefined remain undefined. In the second case, defined pixels surrounded by undefined ones may become undefined and vice-versa.
RemoveNoise	In a EDepthMap or EZMap, removes noisy pixels. A square filter window is moved over the depthmap. Within this filter window, the average and/or the standard deviation is/are calculated and a rejection criteria defined by the parameter 'method' determines which pixels will be removed. If the rejection criteria determines that a pixel has to be removed or if there is not enough valid pixels in the window filter, as specified by the parameter 'minValidRatio', the pixel is either simply removed (marked 'invalid') or replaced by the average value (within the filter window), depending on the value of 'replaceByAvg'.

EFilters.Median

In a EDepthMap or EZMap, removes noisy pixels by using a median filter.
The median filter may ignore undefined values or not. In the first case, defined pixels remain defined and undefined remain undefined. In the second case, defined pixels surrounded by undefined ones may become undefined and vice-versa.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Median(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceDepthMap,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationDepthMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceDepthMap,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationDepthMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceDepthMap,
 Euresys.Open_eVision.Easy3D.EDepthMap32f destinationDepthMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationDepthMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationDepthMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )
```

```
void Median(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceDepthMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap32f destinationDepthMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceZMap,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationZMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceZMap,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationZMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceZMap,
 Euresys.Open_eVision.Easy3D.EZMap32f destinationZMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationZMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )

void Median(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationZMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )
```

```
void Median(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap32f destinationZMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight,
 bool ignoreUndefinedPixels
 )
```

Parameters

sourceDepthMap
The source depthmap.

destinationDepthMap
The destination depthmap. It should have the same dimensions as the source depthmap.

halfOfKernelWidth
Half width of the kernel minus one (by default, halfOfKernelWidth = 1; 0 is allowed).

halfOfKernelHeight
Half height of the kernel minus one (by default, same as halfOfKernelHeight; 0 is allowed).

ignoreUndefinedPixels
Ignores the undefined pixels when computing the medians (by default, true).

region
Region to apply the function on.

sourceZMap
The source ZMap.

destinationZMap
The destination ZMap. It should have the same dimensions as the source ZMap.

EFilters.RemoveNoise

In a EDepthMap or EZMap, removes noisy pixels. A square filter window is moved over the depthmap.
Within this filter window, the average and/or the standard deviation is/are calculated and a rejection criteria defined by the parameter 'method' determines which pixels will be removed.
If the rejection criteria determines that a pixel has to be removed or if there is not enough valid pixels in the window filter, as specified by the parameter 'minValidRatio', the pixel is either simply removed (marked 'invalid') or replaced by the average value (within the filter window), depending on the value of 'replaceByAvg'.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void RemoveNoise(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceDepthMap,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationDepthMap,
 Euresys.Open_eVision.Easy3D.ENoiseRemovalMethod method,
 short halfKernelSize,
 float threshold,
 float minValidRatio,
 bool replaceByAvg
 )

void RemoveNoise(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceDepthMap,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationDepthMap,
 Euresys.Open_eVision.Easy3D.ENoiseRemovalMethod method,
 short halfKernelSize,
 float threshold,
 float minValidRatio,
 bool replaceByAvg
 )

void RemoveNoise(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceZMap,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationZMap,
 Euresys.Open_eVision.Easy3D.ENoiseRemovalMethod method,
 short halfKernelSize,
 float threshold,
 float minValidRatio,
 bool replaceByAvg
 )

void RemoveNoise(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceZMap,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationZMap,
 Euresys.Open_eVision.Easy3D.ENoiseRemovalMethod method,
 short halfKernelSize,
 float threshold,
 float minValidRatio,
 bool replaceByAvg
 )
```

Parameters

sourceDepthMap

The source depthmap.

destinationDepthMap

The destination depthmap. It should have the same dimensions as the source depthmap.

method

Noise removal method of type ENoiseRemovalMethod.

halfKernelSize

The half-size of the window filter. The filter window size (= kernel size) is halfKernelSize * 2 + 1, should be positive, smaller than (or equal to) the image size, and may not exceed 256.

threshold

The threshold used by the rejection criteria, as explained in ENoiseRemovalMethod.

minValidRatio

Required ratio of valid pixels in the filter window to process the calculation. If not enough, marks the pixel for replacement. Setting this ratio to 0.0 means that only one pixel has to be valid. The default value is 0.25 .

replaceByAvg

The marked pixels are removed by default; if this parameter is set to true, replaces the marked pixels by the average value, calculated within the filter window.

sourceZMap

The source ZMap.

destinationZMap

The destination ZMap. It should have the same dimensions as the source ZMap.

4.97. EFindFeaturePoint Class

Represents a feature point obtained from learning a model using EPatternFinder.

Namespace: Euresys.Open_eVision

Properties

GradientX	The gradient value in th X direction.
GradientY	The gradient value in th Y direction.
Position	The position of the feature point

Methods

EFindFeaturePoint	Constructs a default EFindFeaturePoint object.
operator!=	Checks if two EFindFeaturePoint are stricly different.
operator=	Assignment operator for the EFindFeaturePoint.
operator==	Checks if two EFindFeaturePoint are stricly equal.

EFindFeaturePoint.EFindFeaturePoint

Constructs a default EFindFeaturePoint object.

Namespace: Euresys.Open_eVision

[C#]

```
void EFindFeaturePoint(
 )

void EFindFeaturePoint(
 float x,
 float y,
 short gradientX,
 short gradientY
 )

void EFindFeaturePoint(
 Euresys.Open_eVision.EFindFeaturePoint other
 )
```

Parameters

x

x coordinate of the point.

y

y coordinate of the point.

gradientX

Gradient value in the x direction.

gradientY

Gradient value in the y direction.

other

Reference to another EFindFeaturePoint used for the initialization.

Remarks

If the default constructor is used, the point is initialized to (0, 0) for both position and gradient values.

EFindFeaturePoint.GradientX

The gradient value in th X direction.

Namespace: Euresys.Open_eVision

[C#]

```
short GradientX
  { get; }
```

EFindFeaturePoint.GradientY

The gradient value in th Y direction.

Namespace: Euresys.Open_eVision

[C#]

```
short GradientY
  { get; }
```

EFindFeaturePoint.operator!=

Checks if two EFindFeaturePoint are stricly different.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EFindFeaturePoint point
 )
```

Parameters

point

The other point.

EFindFeaturePoint.operator=

Assignment operator for the EFindFeaturePoint.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFindFeaturePoint operator=(
 Euresys.Open_eVision.EFindFeaturePoint other
 )
```

Parameters

other

-

EFindFeaturePoint.operator==

Checks if two EFindFeaturePoint are stricly equal.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator==(
 Euresys.Open_eVision.EFindFeaturePoint point
 )
```

Parameters

point

The other point.

EFindFeaturePoint.Position

The position of the feature point

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Position
  { get; }
```

4.98. EFloatRange Class

Represents a range of floating point values.

Namespace: Euresys.Open_eVision

Properties

Center	Center of the range.
LowerBound	Lower bound of the range.
Size	Size of the range.
UpperBound	Upper bound of the range.

Methods

EFloatRange	Creates an EFloatRange object.
IsInRange	Checks if a value is inside the range.
IsValid	Returns true if the range is defined and valid
operator=	Assignment operator
operator==	Comparison operator
SetBounds	Sets the bounds of the range.
SetFromBaseAndAbsoluteTolerance	Sets the bounds of the range from a base value and an absolute tolerance from this base value.

SetFromBaseAndRelativeTolerance	Sets the bounds of the range from a base value and a relative tolerance from this base value.
Update	Updates the range. If the value passed is outside of the range bounds, they are modified so they include the value.

EFloatRange.Center

Center of the range.

Namespace: Euresys.Open_eVision

```
[C#]
float Center
  { get; }
```

EFloatRange.EFloatRange

Creates an EFloatRange object.

Namespace: Euresys.Open_eVision

```
[C#]
void EFloatRange(
 )
void EFloatRange(
 float min,
 float max
 )
void EFloatRange(
 Euresys.Open_eVision.EFloatRange range
 )
```

Parameters

min
Lower bound of the range.

max
Upper bound of the range.

range
Range to copy.

EFloatRange.IsInRange

Checks if a value is inside the range.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsInRange(
 float value,
 bool lowerBoundInclusive,
 bool upperBoundInclusive
 )
```

Parameters

value

Value to test.

lowerBoundInclusive

Indicates if the lower bound should be considered inside the range (true) or outside (false).

upperBoundInclusive

Indicates if the upper bound should be considered inside the range (true) or outside (false).

EFloatRange.IsValid

Returns true if the range is defined and valid

Namespace: Euresys.Open_eVision

```
[C#]
bool IsValid(
 )
```

EFloatRange.LowerBound

Lower bound of the range.

Namespace: Euresys.Open_eVision

```
[C#]
float LowerBound
  { get; }
```

EFloatRange.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFloatRange operator=(
 Euresys.Open_eVision.EFloatRange other
 )
```

Parameters

other

-

EFloatRange.operator==

Comparison operator

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EFloatRange other
 )
```

Parameters

other

The other object.

EFloatRange.SetBounds

Sets the bounds of the range.

Namespace: Euresys.Open_eVision

```
[C#]
void SetBounds(
 float min,
 float max
 )
```

Parameters

min

Lower bound of the range.

max

Upper bound of the range.

EFloatRange.SetFromBaseAndAbsoluteTolerance

Sets the bounds of the range from a base value and an absolute tolerance from this base value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromBaseAndAbsoluteTolerance(
 float baseValue,
 float tolerance
 )
```

Parameters

baseValue

Base value.

tolerance

Absolute tolerance around the base value. Must be positive.

Remarks

The range will be set with a lower bound of (base - tolerance) and an upper bound of (base + tolerance).

EFloatRange.SetFromBaseAndRelativeTolerance

Sets the bounds of the range from a base value and a relative tolerance from this base value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromBaseAndRelativeTolerance(
 float baseValue,
 float tolerance
 )
```

Parameters

baseValue

Base value.

tolerance

Relative tolerance around the base value. Must be positive.

Remarks

The range will be set with a lower bound of (base - (base * tolerance)) and an upper bound of (base + (base * tolerance)).

EFloatRange.Size

Size of the range.

Namespace: Euresys.Open_eVision

[C#]

```
float Size
  { get; }
```

EFloatRange.Update

Updates the range. If the value passed is outside of the range bounds, they are modified so they include the value.

Namespace: Euresys.Open_eVision

[C#]

```
void Update(
 float value
 )
void Update(
 Euresys.Open_eVision.EFloatRange other
 )
```

Parameters

value

Value to be included in the range.

other

-

EFloatRange.UpperBound

Upper bound of the range.

Namespace: Euresys.Open_eVision

[C#]

```
float UpperBound
  { get; }
```

4.99. EFont Class

Font.

Namespace: Euresys.Open_eVision

Properties

Family	Font family name.
Size	Size of the font.
Style	Font style.

Methods

EFont	Constructs a EFont.
IsValid	Wether the font is valid (Size != 0 and Family defined).
Load	Loads the EFont. The given ESerializer must have been created for reading.
operator!=	Inequality operator.
operator=	-
operator==	Equality operator.
Save	Saves the EFont. The given ESerializer must have been created for writing.
Serialize	Serializes the EFont.

EFont.EFont

Constructs a EFont.

Namespace: Euresys.Open_eVision

[C#]

```
void EFont(
 )

void EFont(
 string fontFamily,
 int pointSize,
 Euresys.Open_eVision.EFontStyle style
 )

void EFont(
 Euresys.Open_eVision.EFont other
 )
```

Parameters

fontFamily
Font family
pointSize
Font size
style
Font style
other
-

EFont.Family

Font family name.

Namespace: Euresys.Open_eVision

[C#]

```
string Family
  { get; set; }
```

EFont.IsValid

Wether the font is valid (Size != 0 and Family defined).

Namespace: Euresys.Open_eVision

[C#]

```
bool IsValid(
 )
```

EFont.Load

Loads the EFont. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EFont.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EFont other
 )
```

Parameters

other
Other font to compare with.

EFont.operator=

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFont operator=(
 Euresys.Open_eVision.EFont other
 )
```

Parameters

other
-

EFont.operator==

Equality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EFont other
 )
```

Parameters

other

Other font to compare with.

EFont.Save

Saves the EFont. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EFont.Serialize

Serializes the EFont.

Namespace: Euresys.Open_eVision

[C#]

```
void Serialize(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Serializer

EFont.Size

Size of the font.

Namespace: Euresys.Open_eVision

[C#]

```
int Size
  { get; set; }
```

EFont.Style

Font style.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFontStyle Style
  { get; set; }
```

4.100. EFoundPattern Class

Represents a single instance of the pattern in the search field, as returned by the EasyFind finding process.

Remarks

EPatternFinder::Find returns a collection of instances of this class. An EFoundPattern object represents one found instance, with all the needed information about it.

Namespace: Euresys.Open_eVision

Properties

Angle	Angle of the found instance, in the current angle unit.
Center	Reference point of the instance.
DrawBoundingBox	Flag indicating if the EFoundPattern::Draw method must draw the bounding box of the FoundPattern.
DrawCenter	Flag indicating if the EFoundPattern::Draw method must draw the center of the FoundPattern.
DrawFeaturePoints	Flag indicating if the EFoundPattern::Draw method must draw the feature points of the EFoundPattern object.
Quadrangle	Returns the corners of the bounding box of the found pattern.
Scale	Scaling factor of the found pattern, in units (not percents).
Score	Matching score of the found pattern, in units (not percents).

Methods

Draw	Draws the found pattern, in image coordinates.

DrawWithCurrentPen	Draws the found pattern, in image coordinates.
EFoundPattern	Constructs a EFoundPattern object.
operator!=	Inequality operator.
operator=	Copies all the data from another EFoundPattern object into the current EFoundPattern object
operator==	Equality operator.
ToRegion	Creates an ERegion from the EFoundPattern. The ERegion represents all the pixels which are within the bounding box of the Pattern.

EFoundPattern.Angle

Angle of the found instance, in the current angle unit.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; }
```

Remarks

Read-only. This returned value is always comprised in the range [- a half turn, + a half turn].

EFoundPattern.Center

Reference point of the instance.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; }
```

Remarks

By default, this is its center. If the property EPatternFinder::Pivot has been changed in the EPatternFinder, the point returns the pivot_ in the instance.

EFoundPattern.Draw

Draws the found pattern, in image coordinates.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Horizontal zooming factor.

zoomY

Vertical zooming factor. If set to 0, the horizontal zooming factor will be used for isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

This method draws different features of the EFoundPattern, according to the value of properties EFoundPattern::DrawFeaturePoints, EFoundPattern::DrawCenter, EFoundPattern::DrawBoundingBox. The zoomX, zoomY, panX and panY parameters can be used to scale and/or translate the drawing operations. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EFoundPattern.DrawBoundingBox

Flag indicating if the EFoundPattern::Draw method must draw the bounding box of the FoundPattern.

Namespace: Euresys.Open_eVision

```
[C#]
bool DrawBoundingBox
  { get; set; }
```

Remarks

The default value is true.

EFoundPattern.DrawCenter

Flag indicating if the EFoundPattern::Draw method must draw the center of the FoundPattern.

Namespace: Euresys.Open_eVision

```
[C#]
bool DrawCenter
  { get; set; }
```

Remarks

The default value is true.

EFoundPattern.DrawFeaturePoints

Flag indicating if the EFoundPattern::Draw method must draw the feature points of the EFoundPattern object.

Namespace: Euresys.Open_eVision

```
[C#]
bool DrawFeaturePoints
  { get; set; }
```

Remarks

The default value is false.

EFoundPattern.DrawWithCurrentPen

This method is deprecated.

Draws the found pattern, in image coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Horizontal zooming factor.

zoomY

Vertical zooming factor. If set to 0, the horizontal zooming factor will be used for isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

This method draws different features of the EFoundPattern, according to the value of properties EFoundPattern::DrawFeaturePoints, EFoundPattern::DrawCenter, EFoundPattern::DrawBoundingBox. The zoomX, zoomY, panX and panY parameters can be used to scale and/or translate the drawing operations. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EFoundPattern.EFoundPattern

Constructs a EFoundPattern object.

Namespace: Euresys.Open_eVision

```
[C#]
void EFoundPattern(
 )

void EFoundPattern(
 Euresys.Open_eVision.EFoundPattern other
 )
```

Parameters

other

EFoundPattern object to be copied

EFoundPattern.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EFoundPattern other
 )
```

Parameters

other

Instance to compare to.

EFoundPattern.operator=

Copies all the data from another EFoundPattern object into the current EFoundPattern object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFoundPattern operator=(
 Euresys.Open_eVision.EFoundPattern other
 )
```

Parameters

other

EFoundPattern object to be copied

EFoundPattern.operator==

Equality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EFoundPattern other
 )
```

Parameters

other

Instance to compare to.

EFoundPattern.Quadrangle

Returns the corners of the bounding box of the found pattern.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQuadrangle Quadrangle
  { get; }
```

EFoundPattern.Scale

Scaling factor of the found pattern, in units (not percents).

Namespace: Euresys.Open_eVision

```
[C#]
float Scale
  { get; }
```

EFoundPattern.Score

Matching score of the found pattern, in units (not percents).

Namespace: Euresys.Open_eVision

```
[C#]
float Score
  { get; }
```

Remarks

The matching score range is [-1.0..1.0].

EFoundPattern.ToRegion

Creates an ERegion from the EFoundPattern. The ERegion represents all the pixels which are within the bounding box of the Pattern.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERegion ToRegion(
 )
```

4.101. EFourierTransformer Class

Manages direct and inverse Fast Fourier Transforms.

Namespace: Euresys.Open_eVision

Properties

FrequentialDomainFormat	Gets/Sets the data format used to represent frequential domain images. Default value is EFrequentialDomainFormat_Packed.

Methods

DirectTransform	Computes the direct transform.
EFourierTransformer	Constructs an EFourierTransformer object initialized to its default values.
InverseTransform	Computes the inverse transform.
Load	Loads the EFourierTransformer. The given ESerializer must have been created for reading.
operator!=	Checks if this EFourierTransformer instance is not strictly equal to another
operator=	Assignment operator.
operator==	Checks if this EFourierTransformer instance is strictly equal to another
Save	Saves the EFourierTransformer. The given ESerializer must have been created for writing.

EFourierTransformer.DirectTransform

Computes the direct transform.

Namespace: Euresys.Open_eVision

[C#]

```
void DirectTransform(
 Euresys.Open_eVision.EROIBW8 spatialImage,
 Euresys.Open_eVision.EROIBW32f frequentialImage
 )
```

```
void DirectTransform(
 Euresys.Open_eVision.EROIBW16 spatialImage,
 Euresys.Open_eVision.EROIBW32f frequentialImage
 )
void DirectTransform(
 Euresys.Open_eVision.EROIBW32f spatialImage,
 Euresys.Open_eVision.EROIBW32f frequentialImage
 )
```

Parameters

spatialImage

input image in spatial domain.

frequentialImage

output image in frequential domain. Must be of the same size as spatialImage if EFourierTransformer::FrequentialDomainFormat is EFrequentialDomainFormat_Packed or twice larger if it is EFrequentialDomainFormat_ComplexExtended.

Remarks

No scaling is applied, scaling applied in EFourierTransformer::InverseTransform.

EFourierTransformer.EFourierTransformer

Constructs an EFourierTransformer object initialized to its default values.

Namespace: Euresys.Open_eVision

[C#]

```
void EFourierTransformer(
 )
void EFourierTransformer(
 Euresys.Open_eVision.EFourierTransformer other
 )
```

Parameters

other

Another EFourierTransformer.

EFourierTransformer.FrequentialDomainFormat

Gets/Sets the data format used to represent frequential domain images. Default value is EFrequentialDomainFormat_Packed.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFrequentialDomainFormat FrequentialDomainFormat
```

```
{ get; set; }
```

EFourierTransformer.InverseTransform

Computes the inverse transform.

Namespace: Euresys.Open_eVision

[C#]

```
void InverseTransform(
 Euresys.Open_eVision.EROIBW32f frequentialImage,
 Euresys.Open_eVision.EROIBW8 spatialImage
 )

void InverseTransform(
 Euresys.Open_eVision.EROIBW32f frequentialImage,
 Euresys.Open_eVision.EROIBW16 spatialImage
 )

void InverseTransform(
 Euresys.Open_eVision.EROIBW32f frequentialImage,
 Euresys.Open_eVision.EROIBW32f spatialImage
 )
```

Parameters

frequentialImage

input image in frequential domain. frequentialImage's width must be a multiple of 2 if EFourierTransformer::FrequentialDomainFormat is EFrequentialDomainFormat_ ComplexExtended.

spatialImage

output image in spatial domain. Must be of the same size as frequentialImage if EFourierTransformer::FrequentialDomainFormat is EFrequentialDomainFormat_Packed or twice thinner if it is EFrequentialDomainFormat_ComplexExtended.

Remarks

Scaling is applied, no scaling applied in EFourierTransformer::DirectTransform.

EFourierTransformer.Load

Loads the EFourierTransformer. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
```

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EFourierTransformer.operator!=

Checks if this EFourierTransformer instance is not strictly equal to another

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EFourierTransformer other
 )
```

Parameters

other
Reference to the other EFourierTransformer instance

EFourierTransformer.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFourierTransformer operator=(
 Euresys.Open_eVision.EFourierTransformer other
 )
```

Parameters

other
Another EFourierTransformer.

EFourierTransformer.operator==

Checks if this EFourierTransformer instance is strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EFourierTransformer other
 )
```

Parameters

other

Reference to the other EFourierTransformer instance

EFourierTransformer.Save

Saves the EFourierTransformer. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.102. EFrame Class

Represents a geometrical frame of reference as well as the parameters needed to transform from/to local and global coordinates. It contains a point and an angle and serves as a base class for geometrical elements.

Base Class:EPoint

Derived Class(es):ECircleELineEPolygonERectangleEWedge

Namespace: Euresys.Open_eVision

Properties

Angle	Orientation of the frame.
CenterX	Abscissa of the origin point of the frame.
CenterY	Ordinate of the origin point of the frame.

Scale	Horizontal sensor resolution, in pixels per unit.

Methods

CopyTo	Copies all the data from the current EFrame object into another EFrame object, and returns it.
EFrame	Constructs a EFrame object.
GlobalToLocal	Transforms a geometrical element from global to local coordinates (world to local).
Load	Load the EFrame configuration. The given ESerializer must have been created for reading.
LocalToGlobal	Transforms a geometrical element from local to global coordinates (local to world).
operator=	Copies all the data from another EFrame object into the current EFrame object.
Save	Save the EFrame configuration. The given ESerializer must have been created for writing.

EFrame.Angle

Orientation of the frame.

Namespace: Euresys.Open_eVision

```
[C#]
float Angle
  { get; set; }
```

EFrame.CenterX

Abscissa of the origin point of the frame.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterX
  { get; }
```

EFrame.CenterY

Ordinate of the origin point of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

EFrame.CopyTo

Copies all the data from the current EFrame object into another EFrame object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EFrame other
 )

Euresys.Open_eVision.EFrame CopyTo(
 Euresys.Open_eVision.EFrame other
 )
```

Parameters

other

Pointer to the EFrame object in which the current EFrame object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EFrame object will be created and returned.

EFrame.EFrame

Constructs a EFrame object.

Namespace: Euresys.Open_eVision

[C#]

```
void EFrame(
 )

void EFrame(
 float centerX,
 float centerY,
 float angle,
 float scale
 )

void EFrame(
 Euresys.Open_eVision.EPoint center,
 float angle,
 float scale
 )
```

```
void EFrame(
 Euresys.Open_eVision.EFrame frame
 )
```

Parameters

centerX
Abscissa of the origin point of the frame.

centerY
Ordinate of the origin point of the frame.

angle
Orientation of the frame.

scale
Horizontal sensor resolution.

center
Coordinates of the origin point of the frame.

frame
Pre-existing EFrame object used by the copy constructor.

EFrame.GlobalToLocal

Transforms a geometrical element from global to local coordinates (world to local).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GlobalToLocal(
 Euresys.Open_eVision.EPoint global
 )
Euresys.Open_eVision.EFrame GlobalToLocal(
 Euresys.Open_eVision.EFrame global
 )
```

Parameters

global
The element, expressed in global coordinates.

EFrame.Load

Load the EFrame configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EFrame.LocalToGlobal

Transforms a geometrical element from local to global coordinates (local to world).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint LocalToGlobal(
 Euresys.Open_eVision.EPoint local
 )
Euresys.Open_eVision.EFrame LocalToGlobal(
 Euresys.Open_eVision.EFrame local
 )
Euresys.Open_eVision.ELine LocalToGlobal(
 Euresys.Open_eVision.ELine local
 )
Euresys.Open_eVision.ECircle LocalToGlobal(
 Euresys.Open_eVision.ECircle local
 )
```

Parameters

local
The element, expressed in local coordinates.

EFrame.operator=

Copies all the data from another EFrame object into the current EFrame object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFrame operator=(
 Euresys.Open_eVision.EFrame frame
 )
```

Parameters

frame
EFrame object to be copied.

EFrame.Save

Save the EFrame configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.
serializer
The serializer.

EFrame.Scale

Horizontal sensor resolution, in pixels per unit.

Namespace: Euresys.Open_eVision

```
[C#]
float Scale
  { get; set; }
```

4.103. EFrameShape Class

Manages a complete context for measuring frame shapes.

Remarks

This class allows the grouping of several gauges or other frames.

Base Class:EShape

Namespace: Euresys.Open_eVision

Properties

Angle	The angle of the frame.
Center	Origin point coordinates of the frame.
CenterX	Gets the origin point abscissa of the frame.
CenterY	Gets the origin point ordinate of the frame.
Scale	The scale of the frame.
SizeX	Frame X-axis length.
SizeY	Frame Y-axis length.
Type	Type of the frame.

Methods

Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
CopyTo	Copy operator.
Drag	Moves a handle to a new position and updates the position parameters of the shape.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
EFrameShape	Construct a EFrameShape object.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
operator=	Assignement operator.
Set	Sets the coordinates of the origin point and the orientation of the frame.
SetCenterXY	Sets the origin point coordinates of the frame.
SetSize	Sets the frame size.

EFrameShape.Angle

The angle of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

EFrameShape.Center

Origin point coordinates of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

EFrameShape.CenterX

Gets the origin point abscissa of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

EFrameShape.CenterY

Gets the origin point ordinate of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

EFrameShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

[C#]

```
void Closest(
 )
```

EFrameShape.CopyTo

Copy operator.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EFrameShape other,
 bool recursive
 )

Euresys.Open_eVision.EFrameShape CopyTo(
 Euresys.Open_eVision.EFrameShape other,
 bool recursive
 )
```

Parameters

other

EFrameShape object to copy to.

recursive

true if the daughter shapes have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EFrameShape object will be created and returned.

EFrameShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int cursorX,
 int cursorY
 )
```

Parameters

cursorX

Current cursor coordinates.

cursorY

Current cursor coordinates.

EFrameShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the shape must be displayed, as defined by EDrawingMode.

daughters

true if the daughter shapes are to be displayed also.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EFrameShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EFrameShape.EFrameShape

Construct a EFrameShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void EFrameShape(
 )
void EFrameShape(
 Euresys.Open_eVision.EFrameShape frameShape
 )
```

Parameters

frameShape

Pre-existing EFrameShape object used by the copy constructor.

Remarks

With the default constructor, all parameters are initialized to their respective default value. With the copy constructor, the constructed frame shape measurement context is based on a pre-existing EFrameShape object. By default, the daughter shapes are also copied. Use the EFrameShape::CopyTo method to disable explicitly the daughter shapes copy.

EFrameShape.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool daughter
 )
```

Parameters

daughter

true if the daughters shapes handles have to be considered as well.

EFrameShape.operator=

Assignement operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFrameShape operator=(
 Euresys.Open_eVision.EFrameShape other
 )
```

Parameters

other

EFrameShape object to copy.

Remarks

By default, the daughter shapes are also copied. Use the EFrameShape::CopyTo method to disable explicitly the daughter shapes copy.

EFrameShape.Scale

The scale of the frame.

Namespace: Euresys.Open_eVision

```
[C#]
float Scale
  { get; set; }
```

EFrameShape.Set

Sets the coordinates of the origin point and the orientation of the frame.

Namespace: Euresys.Open_eVision

```
[C#]
void Set(
 Euresys.Open_eVision.EPoint center,
 float angle,
 float scale
 )
```

Parameters

center

Coordinates of the origin point of the frame. The default value is (0,0).

angle

Rotation angle of the frame. The default value is 0.

scale

Horizontal sensor resolution, in pixels per unit

EFrameShape.SetCenterXY

Sets the origin point coordinates of the frame.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Abscissa of the origin point of the frame. Default value is 0.

centerY

Ordinate of the origin point of the frame. Default value is 0.

EFrameShape.SetSize

Sets the frame size.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSize(
 float sizeX,
 float sizeY
 )
```

Parameters

sizeX

Frame X-axis length. The default value is 100.

sizeY

Frame Y-axis length. By default, both axes have the same length.

Remarks

By default, both frame axis value are set to 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

EFrameShape.SizeX

Frame X-axis length.

Namespace: Euresys.Open_eVision

[C#]

```
float SizeX
  { get; }
```

Remarks

By default, both frame axis values are set to 100, which means 100 pixels when the field of view is not calibrated, and 100 physical units in case of a calibrated field of view.

EFrameShape.SizeY

Frame Y-axis length.

Namespace: Euresys.Open_eVision

[C#]

```
float SizeY
  { get; }
```

Remarks

By default, both frame axis values are set to 100, which means 100 pixels when the field of view is not calibrated, and 100 physical units in case of a calibrated field of view.

EFrameShape.Type

Type of the frame.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

4.104. EGDIPlusDrawAdapter Class

This class is deprecated.

Deprecated: This class was renamed EWindowsDrawAdapter.

Base Class:EWindowsDrawAdapter

Namespace: Euresys.Open_eVision

Methods

EGDIPlusDrawAdapter	-

EGDIPlusDrawAdapter.EGDIPlusDrawAdapter

This method is deprecated.

-

Namespace: Euresys.Open_eVision

```
[C#]
void EGDIPlusDrawAdapter(
 IntPtr dc
 )
```

Parameters

dc

-

4.105. EGenericDrawAdapter Class

A type of draw adapter able to make rendering in images and yielding similar results on all platforms. The EGenericDrawAdapter draws directly in an EROIC24A and uses CPU calculation.

Remarks

EGenericDrawAdapter only support drawing in EC24A images and ROIs.

Base Class:EDrawAdapter

Namespace: Euresys.Open_eVision

Properties

Font	Default font. Defaults to "Roboto" in EGenericDrawAdapter. That font is distributed with Open eVision and will be available on all platforms.
UseAntialiasing	Indicates if anti-aliasing should be used for rendering.

Methods

Arc	Draws an arc defined by a rectangle, angle, and amplitude.
BackedText	Draws a text with a background.
DrawPoint	Draws a point at the given coordinate.
EGenericDrawAdapter	Constructs an instance of EGenericDrawAdapter that will render to an EROIC24A.
Ellipse	Draws an ellipse.
FilledEllipse	Fills an ellipse.
FilledPolygon	Fills a polygon.
FilledRectangle	Fills a rectangle.
GetTextSize	Size of the given text using the default font (EGenericDrawAdapter::Font).
Image	Draws an image.
Line	Draws a line between two points.
Polygon	Draws a polygon.
Rectangle	Draws a rectangle.
Text	Draws a text.
UseCurrentBrush	Resets the brush to a white opaque brush.
UseCurrentPen	Resets the pen to a black opaque pen.

EGenericDrawAdapter.Arc

Draws an arc defined by a rectangle, angle, and amplitude.

Namespace: Euresys.Open_eVision

[C#]

```
void Arc(
 int orgX,
 int orgY,
 int width,
 int height,
 float startAngle,
 float amplitude,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

startAngle
Starting angle of the arc in radians

amplitude
Amplitude of the arc in radians

pen
Optional pen to use

EGenericDrawAdapter.BackedText

Draws a text with a background.

Namespace: Euresys.Open_eVision

[C#]

```
void BackedText(
 string text,
 int x,
 int y,
 Euresys.Open_eVision.EBrush textBrush,
 Euresys.Open_eVision.EBrush backgroundBrush
 )
```

```
void BackedText(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush,
 Euresys.Open_eVision.EBrush backgroundBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

textBrush
Optional brush to use for the color of the text.

backgroundBrush
Optional brush to use for the background.

orientation
Orientation of the text.

EGenericDrawAdapter.DrawPoint

Draws a point at the given coordinate.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawPoint(
 int x1,
 int y1,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate

y1
Y coordinate

pen
Optional pen to use

EGenericDrawAdapter.EGenericDrawAdapter

Constructs an instance of EGenericDrawAdapter that will render to an EROIC24A.

Namespace: Euresys.Open_eVision

```
[C#]
void EGenericDrawAdapter(
 Euresys.Open_eVision.EROIC24A pImage,
 bool useAntiAliasing
 )
```

Parameters

pImage
The image to render to

useAntiAliasing
Indicates if anti-aliasing should be used for rendering.

EGenericDrawAdapter.Ellipse

Draws an ellipse.

Namespace: Euresys.Open_eVision

```
[C#]
void Ellipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle containing the ellipse

orgY
Y origin of the rectangle containing the ellipse

width
Width of the rectangle containing the ellipse

height
Height of the rectangle containing the ellipse

pen
Optional pen to use

EGenericDrawAdapter.FilledEllipse

Fills an ellipse.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledEllipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
X origin of the rectangle containing the ellipse

orgY
Y origin of the rectangle containing the ellipse

width
Width of the rectangle containing the ellipse

height
Height of the rectangle containing the ellipse

pen
Optional pen to use for drawing the contour of the ellipse

brush
Optional pen to use for drawing the inside of the ellipse

EGenericDrawAdapter.FilledPolygon

Fills a polygon.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledPolygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

points
Points of the polygon

pen
Optional pen to use for drawing the contour of the polygon

brush
Optional pen to use for drawing the inside of the polygon

EGenericDrawAdapter.FilledRectangle

Fills a rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
void FilledRectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

pen
Optional pen to use for drawing the contour of the rectangle

brush
Optional brush to use for filling the inside of the rectangle

EGenericDrawAdapter.Font

Default font. Defaults to "Roboto" in EGenericDrawAdapter. That font is distributed with Open eVision and will be available on all platforms.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EFont Font
  { get; set; }
```

EGenericDrawAdapter.GetTextSize

Size of the given text using the default font (EGenericDrawAdapter::Font).

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetTextSize(
 string text
 )
```

Parameters

text

Text

EGenericDrawAdapter.Image

Draws an image.

Namespace: Euresys.Open_eVision

```
[C#]
void Image(
 Euresys.Open_eVision.EBaseROI image
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EBW8Vector pColorScale
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EC24Vector pColorScale
 )

void Image(
 Euresys.Open_eVision.EBaseROI image,
 float orgX,
 float orgY,
 float width,
 float height
 )
```

```
void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EC24Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )
void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EBW8Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )
```

Parameters

image
Image.

pColorScale
Color scale to draw a grayscale image with.

orgX
X coordinate of the point where to draw the image.

orgY
Y coordinate of the point where to draw the image.

width
Width of the destination rectangle in which to draw the image.

height
Height of the destination rectangle in which to draw the image.

EGenericDrawAdapter.Line

Draws a line between two points.

Namespace: Euresys.Open_eVision

[C#]

```
void Line(
 int x1,
 int y1,
 int x2,
 int y2,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate of line origin point

y1
Y coordinate of line origin point

x2
X coordinate of line end point

y2
Y coordinate of line end point

pen
Optional pen to use

EGenericDrawAdapter.Polygon

Draws a polygon.

Namespace: Euresys.Open_eVision

[C#]

```
void Polygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

points
Points of the polygon

pen
Optional pen to use

EGenericDrawAdapter.Rectangle

Draws a rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void Rectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

pen
Optional pen to use

EGenericDrawAdapter.Text

Draws a text.

Namespace: Euresys.Open_eVision

```
[C#]
void Text(
 string text,
 int x,
 int y,
 Euresys.Open_eVision.EBrush textBrush
 )
void Text(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

textBrush
Optional brush to use for the color of the text.

orientation
Orientation of the text in radians.

EGenericDrawAdapter.UseAntialiasing

Indicates if anti-aliasing should be used for rendering.

Namespace: Euresys.Open_eVision

```
[C#]
bool UseAntialiasing
  { get; set; }
```

EGenericDrawAdapter.UseCurrentBrush

Resets the brush to a white opaque brush.

Namespace: Euresys.Open_eVision

```
[C#]
void UseCurrentBrush(
 )
```

EGenericDrawAdapter.UseCurrentPen

Resets the pen to a black opaque pen.

Namespace: Euresys.Open_eVision

```
[C#]
void UseCurrentPen(
 )
```

4.106. EGrabberDepthMap16 Class

The EGrabberDepthMap16 class is used to wrap an EGrabber buffer whose pixel type is "Coord3D_C16". It can be used in Open eVision processing as an EDepthMap16 object.

Base Class:EDepthMap16

Namespace: Euresys.Open_eVision.EGrabberBridge

Methods

EGrabberDepthMap16	Constructs an EGrabberDepthMap16.

EGrabberDepthMap16.EGrabberDepthMap16

Constructs an EGrabberDepthMap16.

Namespace: Euresys.Open_eVision.EGrabberBridge

```
[C#]
void EGrabberDepthMap16(
 BufferInfo infos
 )
void EGrabberDepthMap16(
 ref FormatConvert converter,
 BufferInfo infos
 )
```

Parameters

infos

Information pertaining to an EGrabber buffer

converter

EGrabber format converter

Remarks

The FormatConverter class allows automatic pixel format conversions. If no format converter is provided, the pixel format of the buffer must be "Coord3D_C16"

4.107. EGrabberDepthMap8 Class

The EGrabberDepthMap8 class is used to wrap an EGrabber buffer whose pixel type is "Coord3D_C8". It can be used in Open eVision processing as an EDepthMap8 object.

Base Class:EDepthMap8

Namespace: Euresys.Open_eVision.EGrabberBridge

Methods

EGrabberDepthMap8	Constructs an EGrabberDepthMap8.

EGrabberDepthMap8.EGrabberDepthMap8

Constructs an EGrabberDepthMap8.

Namespace: Euresys.Open_eVision.EGrabberBridge

[C#]

```
void EGrabberDepthMap8(
 BufferInfo infos
 )

void EGrabberDepthMap8(
 ref FormatConvert converter,
 BufferInfo infos
 )
```

Parameters

infos

Information pertaining to an EGrabber buffer

converter

EGrabber format converter

Remarks

The FormatConverter class allows automatic pixel format conversions. If no format converter is provided, the pixel format of the buffer must be "Coord3D_C8"

4.108. EGrabberImageBW16 Class

The EGrabberImageBW16 class is used to wrap an EGrabber buffer whose pixel type is "Mono16". It can be used in Open eVision processing as an EImageBW16 object.

Base Class:EImageBW16

Namespace: Euresys.Open_eVision.EGrabberBridge

Methods

EGrabberImageBW16	Constructs an EGrabberImageBW16.

EGrabberImageBW16.EGrabberImageBW16

Constructs an EGrabberImageBW16.

Namespace: Euresys.Open_eVision.EGrabberBridge

[C#]

```
void EGrabberImageBW16(
 BufferInfo infos
 )

void EGrabberImageBW16(
 ref FormatConvert converter,
 BufferInfo infos
 )
```

Parameters

infos

Information pertaining to an EGrabber buffer

converter

EGrabber format converter

Remarks

The FormatConverter class allows automatic pixel format conversions. If no format converter is provided, the pixel format of the buffer must be "Mono16"

4.109. EGrabberImageBW8 Class

The EGrabberImageBW8 class is used to wrap an EGrabber buffer whose pixel type is "Mono8". It can be used in Open eVision processing as an EImageBW8 object.

Base Class:EImageBW8

Namespace: Euresys.Open_eVision.EGrabberBridge

Methods

EGrabberImageBW8	Constructs an EGrabberImageBW8.

EGrabberImageBW8.EGrabberImageBW8

Constructs an EGrabberImageBW8.

Namespace: Euresys.Open_eVision.EGrabberBridge

[C#]

```
void EGrabberImageBW8(
 BufferInfo infos
 )

void EGrabberImageBW8(
 ref FormatConvert converter,
 BufferInfo infos
 )
```

Parameters

infos

Information pertaining to an EGrabber buffer

converter

EGrabber format converter

Remarks

The FormatConverter class allows automatic pixel format conversions. If no format converter is provided, the pixel format of the buffer must be "Mono8"

4.110. EGrabberImageC24 Class

The EGrabberImageC24 class is used to wrap an EGrabber buffer whose pixel type is "BGR8". It can be used in Open eVision processing as an EImageC24 object.

Base Class:EImageC24

Namespace: Euresys.Open_eVision.EGrabberBridge

Methods

EGrabberImageC24	Constructs an EGrabberImageC24.

EGrabberImageC24.EGrabberImageC24

Constructs an EGrabberImageC24.

Namespace: Euresys.Open_eVision.EGrabberBridge

```
[C#]
void EGrabberImageC24(
 BufferInfo infos
 )
void EGrabberImageC24(
 ref FormatConvert converter,
 BufferInfo infos
 )
```

Parameters

infos

Information pertaining to an EGrabber buffer

converter

EGrabber format converter

Remarks

The FormatConverter class allows automatic pixel format conversions. If no format converter is provided, the pixel format of the buffer must be "BGR8"

4.111. EGrayscaleDoubleThresholdSegmenter Class

Segments an image using a double threshold on a grayscale image.

Remarks

This segmenter is applicable to EROIBW8 and EROIBW16 grayscale images. It produces coded images with three layers: The Black layer (usually, with index 0) contains the unmasked pixels having a gray value strictly below the low threshold value; the White layer (usually, with index 2) contains the unmasked pixels having a gray value above or equal to the high threshold value; and the Neutral layer (usually, with index 1) contains the remaining unmasked pixels.

Base Class:EThreeLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

HighThreshold	Value of the high threshold.
LowThreshold	Value of the low threshold.

Methods

Load	Load the EGrayscaleDoubleThresholdSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the EGrayscaleDoubleThresholdSegmenter configuration. The given ESerializer must have been created for writing.

EGrayscaleDoubleThresholdSegmenter.HighThreshold

Value of the high threshold.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
uint HighThreshold
  { get; set; }
```

EGrayscaleDoubleThresholdSegmenter.Load

Load the EGrayscaleDoubleThresholdSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )
```

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EGrayscaleDoubleThresholdSegmenter.LowThreshold

Value of the low threshold.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
uint LowThreshold
  { get; set; }
```

EGrayscaleDoubleThresholdSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
bool operator==(
 Euresys.Open_eVision.Segmenters.EGrayscaleDoubleThresholdSegmenter other
 )
```

Parameters

other
Other segmenter to compare to.

EGrayscaleDoubleThresholdSegmenter.Save

Save the EGrayscaleDoubleThresholdSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

4.112. EGrayscaleSingleThresholdSegmenter Class

Segments an image using a single threshold on a grayscale image.

Remarks

This segmenter is applicable to EROIBW8 and EROIBW16 grayscale images. It produces coded images with two layers: the black layer (usually, with index 0) contains the unmasked pixels having a gray value strictly below the threshold value; and the white layer (usually, with index 1) contains the remaining unmasked pixels, i.e. unmasked pixels having a gray value greater or equal to the threshold value. The default thresholding method is minimum residue. If another method is required, the EGrayscaleSingleThresholdSegmenter::Mode property must be set prior to encoding.

Base Class:ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

AbsoluteThreshold	Value of the threshold to be used in the case of absolute thresholding.
LastThreshold	Retrieves the actual threshold value that was used for the last image that got encoded by the segmenter.
Mode	Threshold selection mode.
RelativeThreshold	Fraction of the image pixels that belongs to the black layer in the case of relative thresholding.

Methods

IsFirstApplication	Checks whether the segmenter has already been used to segment an image.
Load	Load the EGrayscaleSingleThresholdSegmenter configuration. The given ESerializer must have been created for reading.

operator==	Comparison operator.
Save	Save the EGrayscaleSingleThresholdSegmenter configuration. The given ESerializer must have been created for writing.

EGrayscaleSingleThresholdSegmenter.AbsoluteThreshold

Value of the threshold to be used in the case of absolute thresholding.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
uint AbsoluteThreshold
  { get; set; }
```

EGrayscaleSingleThresholdSegmenter.IsFirstApplication

Checks whether the segmenter has already been used to segment an image.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
bool IsFirstApplication(
 )
```

EGrayscaleSingleThresholdSegmenter.LastThreshold

Retrieves the actual threshold value that was used for the last image that got encoded by the segmenter.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
uint LastThreshold
  { get; }
```

Remarks

A call to this method will result in an exception if it is the first time the segmenter is applied. To check whether the segmenter has already been applied, call the EGrayscaleSingleThresholdSegmenter::IsFirstApplication method.

EGrayscaleSingleThresholdSegmenter.Load

Load the EGrayscaleSingleThresholdSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EGrayscaleSingleThresholdSegmenter.Mode

Threshold selection mode.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
Euresys.Open_eVision.EGrayscaleSingleThreshold Mode
  { get; set; }
```

EGrayscaleSingleThresholdSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
bool operator==(
 Euresys.Open_eVision.Segmenters.EGrayscaleSingleThresholdSegmenter other
 )
```

Parameters

other
Other segmenter to compare to.

EGrayscaleSingleThresholdSegmenter.RelativeThreshold

Fraction of the image pixels that belongs to the black layer in the case of relative thresholding.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
float RelativeThreshold
  { get; set; }
```

EGrayscaleSingleThresholdSegmenter.Save

Save the EGrayscaleSingleThresholdSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

4.113. EGridDecimator Class

Decimation of an EPointCloud.
The grid decimator decimates a point cloud by creating a new point cloud containing a point for each grid cell where at least one point exists in the initial point cloud.
For each grid cell, the point in the new pointCloud is the centroid of the points in the initial point cloud. If the cloud has attributes, the attributes of each new point are the ones of the closest point of the initial point cloud in the same grid.

Base Class:EDecimator

Namespace: Euresys.Open_eVision.Easy3D

Properties

CellSize	Gets/sets the size of the cells in the grid.

Methods

Decimate	Decimates a given EPointCloud and writes the result into a new point cloud.

EGridDecimator	Creates an EGridDecimator object. If the required cell size is not specified, the default value is 10, 10, 10.
operator!=	test inequality between two EGridDecimator.
operator=	Assignment operator.
operator==	test equality between two EGridDecimator.

EGridDecimator.CellSize

Gets/sets the size of the cells in the grid.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint CellSize
  { get; set; }
```

EGridDecimator.Decimate

Decimates a given EPointCloud and writes the result into a new point cloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Decimate(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut
 )
```

Parameters

cloudIn

The input point cloud.

cloudOut

The output point cloud.

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

EGridDecimator.EGridDecimator

Creates an EGridDecimator object. If the required cell size is not specified, the default value is 10, 10, 10.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EGridDecimator(
 )
void EGridDecimator(
 Euresys.Open_eVision.Easy3D.E3DPoint cellSize
 )
void EGridDecimator(
 float isotropicCellSize
 )
void EGridDecimator(
 Euresys.Open_eVision.Easy3D.EGridDecimator other
 )
```

Parameters

cellSize

E3DPoint whose dimensions represent the x,y,z size of the cell

isotropicCellSize

float representing the x,y and z size of the cell

other

Reference to the EGridDecimator object used for the initialization.

EGridDecimator.operator!=

test inequality between two EGridDecimator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator!=(
 Euresys.Open_eVision.Easy3D.EDecimator other
 )
```

Parameters

other

the EGridDecimator to be compared with

EGridDecimator.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EGridDecimator operator=(
 Euresys.Open_eVision.Easy3D.EGridDecimator other
 )
```

Parameters

other

The EGridDecimator object that should be copied.

EGridDecimator.operator==

test equality between two EGridDecimator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.EDecimator other
 )
```

Parameters

other

the EGridDecimator to be compared with

4.114. EGs1Translator Class

Allows To retrieve human-readable GS1 code from machine-readable GS1 code.

Namespace: Euresys.Open_eVision

Methods

GetHumanReadableCode	Converts a machine-readable GS1 code to its human-readable counterpart.

EGs1Translator.GetHumanReadableCode

Converts a machine-readable GS1 code to its human-readable counterpart.

Namespace: Euresys.Open_eVision

```
[C#]
string GetHumanReadableCode(
 string machineReadableCode
 )
```

Parameters

machineReadableCode

The machine readable code returned by one of our code readers.

4.115. EHarrisCornerDetector Class

Manages a complete context for the Harris corner detector.

Remarks

This implementation of the Harris corner detector operates exclusively on a grayscale BW8 images.

Namespace: Euresys.Open_eVision

Properties

DerivationScale	Sets the derivation scale.
GradientNormalizationEnabled	Sets whether the gradient is normalized before the computation of the cornerness measure.
IntegrationScale	The integration scale.
SubpixelPrecisionEnabled	Sets whether the sub-pixel interpolation is enabled.
Threshold	Threshold on the cornerness measure for a pixel to be considered as a corner.
ThresholdingMode	Thresholding mode for the cornerness measure.

Methods

Apply	Apply the Harris corner detector on an image/ROI.
EHarrisCornerDetector	Constructs a EHarrisCornerDetector object initialized to its default values.

EHarrisCornerDetector.Apply

Apply the Harris corner detector on an image/ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void Apply(
 Euresys.Open_eVision.EROIBW8 source,
 Euresys.Open_eVision.EHarrisInterestPoints interestPoints
 )
```

Parameters

source

The source image/ROI.

interestPoints

The container in which to store the interest points.

EHarrisCornerDetector.DerivationScale

Sets the derivation scale.

Namespace: Euresys.Open_eVision

```
[C#]
float DerivationScale
  { get; set; }
```

Remarks

The derivation scale is the standard deviation of the Gaussian Filter used for the noise reduction during the computation of the gradient. Whenever the integration scale is set through EHarrisCornerDetector::IntegrationScale, the derivation scale is reset to its default value, 0.7 * integrationScale. This is a recommended value, as suggested by the literature.

EHarrisCornerDetector.EHarrisCornerDetector

Constructs a EHarrisCornerDetector object initialized to its default values.

Namespace: Euresys.Open_eVision

```
[C#]
void EHarrisCornerDetector(
 )
```

EHarrisCornerDetector.GradientNormalizationEnabled

Sets whether the gradient is normalized before the computation of the cornerness measure.

Namespace: Euresys.Open_eVision

```
[C#]
bool GradientNormalizationEnabled
  { get; set; }
```

Remarks

If this flag is enabled, the values of the X-gradient and of the Y-gradient are first divided by their maximum absolute value (in the internal computations). This results in a cornerness measure that is roughly distributed around the value 1. If this flag is disabled, the cornerness measure will be much greater.

EHarrisCornerDetector.IntegrationScale

The integration scale.

Namespace: Euresys.Open_eVision

[C#]

```
float IntegrationScale
  { get; set; }
```

Remarks

The *integration scale* is the standard deviation of the Gaussian filter that is used for scale analysis.

EHarrisCornerDetector.SubpixelPrecisionEnabled

Sets whether the sub-pixel interpolation is enabled.

Namespace: Euresys.Open_eVision

[C#]

```
bool SubpixelPrecisionEnabled
  { get; set; }
```

Remarks

When this flag is enabled, a sub-pixel interpolation is carried on so as to improve the accuracy of the location of the corners, to the expense of a loss of speed.

EHarrisCornerDetector.Threshold

Threshold on the cornerness measure for a pixel to be considered as a corner.

Namespace: Euresys.Open_eVision

[C#]

```
float Threshold
  { get; set; }
```

Remarks

If the threshold mode is set to Absolute, the threshold value is interpreted as an absolute threshold on the cornerness. In this case, the threshold must be a strictly positive real value.

If the threshold mode is set to Relative, the threshold is expressed as a fraction ranging from 0 to 1 of the maximum value of the cornerness of the source image.

EHarrisCornerDetector.ThresholdingMode

Thresholding mode for the cornerness measure.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EHarrisThresholdingMode ThresholdingMode
  { get; set; }
```

4.116. EHarrisInterestPoints Class

Container class for the results of the Harris corner detector.

Remarks

The EHarrisCornerDetector class stores its results in this container.

Namespace: Euresys.Open_eVision

Properties

PointCount	The number of corner points in the container.

Methods

Draw	Draws the location of the corner points.
DrawCorner	Draws the location of a specific corner point.
DrawCornerWithCurrentPen	Draws the location of a specific corner point.
DrawWithCurrentPen	Draws the location of the corner points.
EHarrisInterestPoints	Constructs a container for the results of a Harris corner detector.
GetCornerness	Returns the cornerness measure of a corner point.
GetGradientMagnitude	Returns the magnitude of the gradient at a corner point.
GetGradientOrientation	Returns the orientation of the gradient at a corner point.
GetGradientX	Returns the gradient along the X-axis of a corner point.
GetGradientY	Returns the gradient along the Y-axis of a corner point.

GetPoint	Returns the coordinates of a corner point.
GetX	Returns the abscissa of a corner point.
GetY	Returns the ordinate of a corner point.

EHarrisInterestPoints.Draw

Draws the location of the corner points.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

originX

Horizontal panning value expressed in pixels. By default, no panning occurs.

originY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EHarrisInterestPoints.DrawCorner

Draws the location of a specific corner point.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawCorner(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 int index,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void DrawCorner(
 IntPtr graphicContext,
 int index,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )

void DrawCorner(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 int index,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Graphic context on which to draw.

index
Corner index

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

originX
Horizontal panning value expressed in pixels. By default, no panning occurs.

originY
Vertical panning value expressed in pixels. By default, no panning occurs.

color
The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EHarrisInterestPoints.DrawCornerWithCurrentPen

This method is deprecated.

Draws the location of a specific corner point.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawCornerWithCurrentPen(
 IntPtr graphicContext,
 int index,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Graphic context on which to draw.

index
Corner index

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

originX

Horizontal panning value expressed in pixels. By default, no panning occurs.

originY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EHarrisInterestPoints.DrawWithCurrentPen

This method is deprecated.

Draws the location of the corner points.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Graphic context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

originX

Horizontal panning value expressed in pixels. By default, no panning occurs.

originY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EHarrisInterestPoints.EHarrisInterestPoints

Constructs a container for the results of a Harris corner detector.

Namespace: Euresys.Open_eVision

```
[C#]
void EHarrisInterestPoints(
 )
```

EHarrisInterestPoints.GetCornerness

Returns the cornerness measure of a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetCornerness(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetGradientMagnitude

Returns the magnitude of the gradient at a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetGradientMagnitude(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetGradientOrientation

Returns the orientation of the gradient at a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetGradientOrientation(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetGradientX

Returns the gradient along the X-axis of a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetGradientX(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetGradientY

Returns the gradient along the Y-axis of a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetGradientY(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetPoint

Returns the coordinates of a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetX

Returns the abscissa of a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetX(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.GetY

Returns the ordinate of a corner point.

Namespace: Euresys.Open_eVision

```
[C#]
float GetY(
 uint index
 )
```

Parameters

index

The index of the corner point.

EHarrisInterestPoints.PointCount

The number of corner points in the container.

Namespace: Euresys.Open_eVision

[C#]

```
uint PointCount
  { get; }
```

4.117. EHDRColorFuser Class

A EHDRColorFuser instance is a tool that flexibly fuses color images using HDR principles.

Namespace: Euresys.Open_eVision

Methods

EHDRColorFuser	Constructors for EHDRColorFuser objects. The image used must be the lightest (slowest shutter speed).
Fuse	Fuses a dark image with the light image passed during object construction.
GetFusedImage	Retrieves the resulting image. Returns false if part of the potential image dynamic is lost due to the chosen output image type.
operator=	Assignment operator

EHDRColorFuser.EHDRColorFuser

Constructors for EHDRColorFuser objects. The image used must be the lightest (slowest shutter speed).

Namespace: Euresys.Open_eVision

[C#]

```
void EHDRColorFuser(
 Euresys.Open_eVision.EROIC24 lightSrc
 )

void EHDRColorFuser(
 Euresys.Open_eVision.EROIC48 lightSrc
 )

void EHDRColorFuser(
 Euresys.Open_eVision.EHDRColorFuser other
 )
```

Parameters

lightSrc

-

other

-

EHDRColorFuser.Fuse

Fuses a dark image with the light image passed during object construction.

Namespace: Euresys.Open_eVision

```
[C#]
void Fuse(
 Euresys.Open_eVision.EROIC24 darkSrc,
 int shutterSpeedFactor
 )
void Fuse(
 Euresys.Open_eVision.EROIC48 darkSrc,
 int shutterSpeedFactor
 )
```

Parameters

darkSrc

Dark input image (higher shutter speed).

shutterSpeedFactor

Shutter speed factor between light and dark image.

EHDRColorFuser.GetFusedImage

Retrieves the resulting image. Returns false if part of the potential image dynamic is lost due to the chosen output image type.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetFusedImage(
 Euresys.Open_eVision.EROIC24 dst
 )
bool GetFusedImage(
 Euresys.Open_eVision.EROIC48 dst
 )
```

Parameters

dst

Output image.

EHDRColorFuser.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EHDRColorFuser operator=(
 Euresys.Open_eVision.EHDRColorFuser other
 )
```

Parameters

other

-

4.118. EHDRFuser Class

A EHDRFuser instance is a tool that flexibly fuses grayscale images using HDR principles.

Namespace: Euresys.Open_eVision

Methods

EHDRFuser	Constructors for EHDRFuser objects. The image used must be the lightest (slowest shutter speed).
Fuse	Fuses a dark image with the light image passed during object construction.
GetFusedImage	Retrieves the resulting image. Returns false if part of the potential image dynamic is lost due to the chosen output image type.
operator=	Assignment operator

EHDRFuser.EHDRFuser

Constructors for EHDRFuser objects. The image used must be the lightest (slowest shutter speed).

Namespace: Euresys.Open_eVision

[C#]

```
void EHDRFuser(
 Euresys.Open_eVision.EROIBW8 lightSrc
 )

void EHDRFuser(
 Euresys.Open_eVision.EROIBW16 lightSrc
 )

void EHDRFuser(
 Euresys.Open_eVision.EHDRFuser other
 )
```

Parameters

lightSrc

-

other

-

EHDRFuser.Fuse

Fuses a dark image with the light image passed during object construction.

Namespace: Euresys.Open_eVision

```
[C#]
void Fuse(
 Euresys.Open_eVision.EROIBW8 darkSrc,
 int shutterSpeedFactor
 )
void Fuse(
 Euresys.Open_eVision.EROIBW16 darkSrc,
 int shutterSpeedFactor
 )
```

Parameters

darkSrc

Dark input image (higher shutter speed).

shutterSpeedFactor

Shutter speed factor between light and dark image.

EHDRFuser.GetFusedImage

Retrieves the resulting image. Returns false if part of the potential image dynamic is lost due to the chosen output image type.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetFusedImage(
 Euresys.Open_eVision.EROIBW8 dst
 )
bool GetFusedImage(
 Euresys.Open_eVision.EROIBW16 dst
 )
bool GetFusedImage(
 Euresys.Open_eVision.EROIBW32 dst
 )
```

Parameters

dst

Output image.

EHDRFuser.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EHDRFuser operator=(
 Euresys.Open_eVision.EHDRFuser other
 )
```

Parameters

other

-

4.119. EHitAndMissKernel Class

Class that defines a kernel for the morphological hit-and-miss operations.

Namespace: Euresys.Open_eVision

Properties

EndX	Returns the abscissa of the rightmost element of the kernel.
EndY	Returns the abscissa of the bottommost element of the kernel.
StartX	Returns the abscissa of the leftmost element of the kernel.
StartY	Returns the ordinate of the toptmost element of the kernel.

Methods

EHitAndMissKernel	Constructs a EHitAndMissKernel object.
GetValue	Returns the value of an element of the kernel at a given coordinate.
SetSize	Modify the size of the kernel.
SetValue	Sets the value of an element of the kernel at a given coordinate.

EHitAndMissKernel.EHitAndMissKernel

Constructs a EHitAndMissKernel object.

Namespace: Euresys.Open_eVision

```
[C#]
void EHitAndMissKernel(
 int startX,
 int startY,
 int endX,
 int endY
 )
void EHitAndMissKernel(
 uint halfSizeX,
 uint halfSizeY
 )
void EHitAndMissKernel(
 )
```

Parameters

startX

The abscissa of the top leftmost element of the kernel. This value must be less than or equal to zero.

startY

The ordinate of the top leftmost element of the kernel. This value must be less than or equal to zero.

endX

The abscissa of the bottom rightmost element of the kernel. This value must be greater than or equal to zero.

endY

The ordinate of the bottom rightmost element of the kernel. This value must be greater than or equal to zero.

halfSizeX

-

halfSizeY

-

Remarks

The constructor without argument creates a centered kernel of size 3x3.

All the elements of the kernel are initialized with DontCare values.

If the object is constructed by specifying the halves of the kernel dimensions, the width (resp. the height) of the kernel is given by "2 * halfSizeX + 1" (resp. "2 * halfSizeY + 1"). Otherwise, the width (resp. the height) of the kernel is given by "endX - startX + 1" (resp. "endY - startY + 1").

EHitAndMissKernel.EndX

Returns the abscissa of the rightmost element of the kernel.

Namespace: Euresys.Open_eVision

[C#]

```
int EndX
  { get; }
```

EHitAndMissKernel.EndY

Returns the abscissa of the bottommost element of the kernel.

Namespace: Euresys.Open_eVision

[C#]

```
int EndY
  { get; }
```

EHitAndMissKernel.GetValue

Returns the value of an element of the kernel at a given coordinate.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EHitAndMissValue GetValue(
 int x,
 int y
 )
```

Parameters

x

The abscissa of the element.

y

The ordinate of the element.

EHitAndMissKernel.SetSize

Modify the size of the kernel.

Namespace: Euresys.Open_eVision

```
[C#]
void SetSize(
 int startX,
 int startY,
 int endX,
 int endY
 )
void SetSize(
 uint halfSizeX,
 uint halfSizeY
 )
```

Parameters

startX

The abscissa of the top leftmost element of the kernel. This value must be less than or equal to zero.

startY

The ordinate of the top leftmost element of the kernel. This value must be less than or equal to zero.

endX

The abscissa of the bottom rightmost element of the kernel. This value must be greater than or equal to zero.

endY

The ordinate of the bottom rightmost element of the kernel. This value must be greater than or equal to zero.

halfSizeX

The half of the kernel width minus 1. This value must be greater than zero.

halfSizeY

The half of the kernel height minus 1. This value must be greater than zero.

Remarks

All the elements of the kernel are initialized with DontCare values.

If the object is constructed by specifying the halves of the kernel dimensions, the width (resp. the height) of the kernel is given by "2 * halfSizeX + 1" (resp. "2 * halfSizeY + 1"). Otherwise, the width (resp. the height) of the kernel is given by "endX - startX + 1" (resp. "endY - startY + 1").

EHitAndMissKernel.SetValue

Sets the value of an element of the kernel at a given coordinate.

Namespace: Euresys.Open_eVision

```
[C#]
void SetValue(
 int x,
 int y,
 Euresys.Open_eVision.EHitAndMissValue value
 )
```

Parameters

x
The abscissa of the element.

y
The ordinate of the element.

value
The value of the element.

EHitAndMissKernel.StartX

Returns the abscissa of the leftmost element of the kernel.

Namespace: Euresys.Open_eVision

```
[C#]
int StartX
  { get; }
```

EHitAndMissKernel.StartY

Returns the ordinate of the toptmost element of the kernel.

Namespace: Euresys.Open_eVision

```
[C#]
int StartY
  { get; }
```

4.120. EHole Class

This class represents a hole inside an object (blob) of an encoded image.

Remarks

This class inherits from the ECodedElement class and provides an additional method to retrieve the parent object of a particular hole.

Base Class:ECodedElement

Namespace: Euresys.Open_eVision

Properties

ParentObjectIndex	Returns the index of the parent object of the hole.

Methods

EHole	-
operator=	-

EHole.EHole

-

Namespace: Euresys.Open_eVision

```
[C#]
void EHole(
 Euresys.Open_eVision.EHole other
 )
```

Parameters

other

-

EHole.operator=

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EHole operator=(
 Euresys.Open_eVision.EHole other
 )
```

Parameters

other

-

EHole.ParentObjectIndex

Returns the index of the parent object of the hole.

Namespace: Euresys.Open_eVision

[C#]

```
uint ParentObjectIndex
  { get; }
```

4.121. EImageBW1 Class

This class is deprecated.

The EImageBW1 class is used to represent rectangular regions of interest inside EBW1 black and white images. See ROIs.

Base Class: EROIBW1

Namespace: Euresys.Open_eVision

Methods

EImageBW1	Constructs a EImageBW1 image.
GetBitIndex	Gets the index of the bit at the given position in the image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageBW1 image.

EImageBW1.EImageBW1

This method is deprecated.

Constructs a EImageBW1 image.

Namespace: Euresys.Open_eVision

[C#]

```
void EImageBW1(
 )

void EImageBW1(
 int width,
 int height
 )

void EImageBW1(
 int width,
 int height,
 Euresys.Open_eVision.EBW1 constant
 )

void EImageBW1(
 Euresys.Open_eVision.EImageBW1 other
 )
```

Parameters

width
The width, in pixels.

height
The height, in pixels.

constant
Binary constant.

other
Another EImageBW1 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageBW1 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageBW1.GetBitIndex

This method is deprecated.

Gets the index of the bit at the given position in the image.

Namespace: Euresys.Open_eVision

[C#]

```
System.UInt64 GetBitIndex(
 int x,
 int y
 )
```

Parameters

x
-

y
-

EImageBW1.InitializeFromUnalignedBuffer

This method is deprecated.

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

```
[C#]
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageBW1.operator=

This method is deprecated.

Copies a EImageBW1 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW1 operator=(
 Euresys.Open_eVision.EImageBW1 other
 )
```

Parameters

other

Another EImageBW1 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.122. EImageBW16 Class

The EImageBW16 class is used to represent rectangular regions of interest inside EBW16 gray-level images. See ROIs.

Base Class:EROIBW16

Derived Class(es):EGrabberImageBW16

Namespace: Euresys.Open_eVision

Methods

EImageBW16	Constructs a EImageBW16 image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageBW16 image.

EImageBW16.EImageBW16

Constructs a EImageBW16 image.

Namespace: Euresys.Open_eVision

[C#]

```
void EImageBW16(
 )

void EImageBW16(
 int width,
 int height
 )

void EImageBW16(
 int width,
 int height,
 Euresys.Open_eVision.EBW16 constant
 )

void EImageBW16(
 Euresys.Open_eVision.EImageBW16 other
 )
```

Parameters

width

The width, in pixels.

height

The height, in pixels.

constant

Gray-level constant.

other

Another EImageBW16 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageBW16 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageBW16.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageBW16.operator=

Copies a EImageBW16 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW16 operator=(
 Euresys.Open_eVision.EImageBW16 other
 )
```

Parameters

other

Another EImageBW16 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.123. EImageBW32 Class

The EImageBW32 class is used to represent rectangular regions of interest inside EBW32 gray-level images. See ROIs.

Base Class:EROIBW32

Namespace: Euresys.Open_eVision

Methods

EImageBW32	Constructs a EImageBW32 image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageBW32 image.

EImageBW32.EImageBW32

Constructs a EImageBW32 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageBW32(
 )
```

```
void EImageBW32(
 int width,
 int height
 )

void EImageBW32(
 int width,
 int height,
 Euresys.Open_eVision.EBW32 constant
 )

void EImageBW32(
 Euresys.Open_eVision.EImageBW32 other
 )
```

Parameters

width

The width, in pixels.

height

The height, in pixels.

constant

Gray-level constant.

other

Another EImageBW32 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageBW32 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageBW32.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageBW32.operator=

Copies a EImageBW32 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW32 operator=(
 Euresys.Open_eVision.EImageBW32 other
 )
```

Parameters

other

Another EImageBW32 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.124. EImageBW32f Class

The EImageBW32f class is used to represent rectangular regions of interest inside EBW32f gray-level images. See ROIs.

Base Class:EROIBW32f

Namespace: Euresys.Open_eVision

Methods

EImageBW32f	Constructs a EImageBW32f image.

InitializeFromUnalignedBuffer	Initializes image from an unaligned buffer.
operator=	Copies a EImageBW32f image.

EImageBW32f.EImageBW32f

Constructs a EImageBW32f image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageBW32f(
 )
void EImageBW32f(
 int width,
 int height
 )
void EImageBW32f(
 int width,
 int height,
 Euresys.Open_eVision.EBW32f constant
 )
void EImageBW32f(
 Euresys.Open_eVision.EImageBW32f other
 )
```

Parameters

width
The width, in pixels.

height
The height, in pixels.

constant
Gray-level constant.

other
Another EImageBW32f object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageBW32f to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageBW32f.InitializeFromUnalignedBuffer

Initializes image from an unaligned buffer.

Namespace: Euresys.Open_eVision

```
[C#]
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageBW32f.operator=

Copies a EImageBW32f image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW32f operator=(
 Euresys.Open_eVision.EImageBW32f other
 )
```

Parameters

other

Another EImageBW32f object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.125. EImageBW8 Class

The EImageBW8 class is used to represent rectangular regions of interest inside EBW8 gray-level images. See ROIs.

Base Class:EROIBW8

Derived Class(es):EGrabberImageBW8

Namespace: Euresys.Open_eVision

Methods

EImageBW8	Constructs a EImageBW8 image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageBW8 image.

EImageBW8.EImageBW8

Constructs a EImageBW8 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageBW8(
 )
void EImageBW8(
 int width,
 int height
 )
void EImageBW8(
 int width,
 int height,
 Euresys.Open_eVision.EBW8 constant
 )
void EImageBW8(
 Euresys.Open_eVision.EImageBW8 other
 )
```

Parameters

width

The width, in pixels.

height

The height, in pixels.

constant

Gray-level constant.

other

Another EImageBW8 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageBW8 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageBW8.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageBW8.operator=

Copies a EImageBW8 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW8 operator=(
 Euresys.Open_eVision.EImageBW8 other
 )
```

Parameters

other

Another EImageBW8 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.126. EImageC15 Class

The EImageC15 class is used to represent rectangular regions of interest inside EC15 color images. See ROIs.

Base Class:EROIC15

Namespace: Euresys.Open_eVision

Methods

EImageC15	Constructs a EImageC15 image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageC15 image.

EImageC15.EImageC15

Constructs a EImageC15 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageC15(
 )
```

```
void EImageC15(
 int width,
 int height
 )

void EImageC15(
 int width,
 int height,
 Euresys.Open_eVision.EC15 constant
 )

void EImageC15(
 Euresys.Open_eVision.EImageC15 other
 )
```

Parameters

width

The width, in pixels.

height

The height, in pixels.

constant

Color constant.

other

Another EImageC15 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

EImageC15.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageC15.operator=

Copies a EImageC15 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC15 operator=(
 Euresys.Open_eVision.EImageC15 other
 )
```

Parameters

other

Another EImageC15 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.127. EImageC16 Class

The EImageC16 class is used to represent rectangular regions of interest inside EC16 color images. See ROIs.

Base Class:EROIC16

Namespace: Euresys.Open_eVision

Methods

EImageC16	Constructs a EImageC16 image.

InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageC16 image.

EImageC16.EImageC16

Constructs a EImageC16 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageC16(
 )
void EImageC16(
 int width,
 int height
 )
void EImageC16(
 int width,
 int height,
 Euresys.Open_eVision.EC16 constant
 )
void EImageC16(
 Euresys.Open_eVision.EImageC16 other
 )
```

Parameters

width
The width, in pixels.

height
The height, in pixels.

constant
Color constant.

other
Another EImageC16 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageC16 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageC16.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

```
[C#]
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageC16.operator=

Copies a EImageC16 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC16 operator=(
 Euresys.Open_eVision.EImageC16 other
 )
```

Parameters

other

Another EImageC16 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.128. EImageC24 Class

The EImageC24 class is used to represent rectangular regions of interest inside EC24 color images. See ROIs.

Base Class:EROIC24

Derived Class(es):EGrabberImageC24

Namespace: Euresys.Open_eVision

Methods

EImageC24	Constructs a EImageC24 image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageC24 image.

EImageC24.EImageC24

Constructs a EImageC24 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageC24(
 )
void EImageC24(
 int width,
 int height
 )
void EImageC24(
 int width,
 int height,
 Euresys.Open_eVision.EC24 constant
 )
void EImageC24(
 Euresys.Open_eVision.EImageC24 other
 )
```

Parameters

width

The width, in pixels.

height

The height, in pixels.

constant

Color constant.

other

Another EImageC24 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageC24 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageC24.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageC24.operator=

Copies a EImageC24 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC24 operator=(
 Euresys.Open_eVision.EImageC24 other
 )
```

Parameters

other

Another EImageC24 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.129. EImageC24A Class

The EImageC24A class is used to represent rectangular regions of interest inside EC24A color images. See ROIs.

Base Class:EROIC24A

Namespace: Euresys.Open_eVision

Methods

EImageC24A	Constructs a EImageC24A image.
InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageC24A image.

EImageC24A.EImageC24A

Constructs a EImageC24A image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageC24A(
 )
```

```
void EImageC24A(
 int width,
 int height
 )

void EImageC24A(
 int width,
 int height,
 Euresys.Open_eVision.EC24A constant
 )

void EImageC24A(
 Euresys.Open_eVision.EImageC24A other
 )
```

Parameters

width

The width, in pixels.

height

The height, in pixels.

constant

Color constant.

other

Another EImageC24A object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageC24A to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageC24A.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

[C#]

```
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageC24A.operator=

Copies a EImageC24A image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC24A operator=(
 Euresys.Open_eVision.EImageC24A other
 )
```

Parameters

other

Another EImageC24A object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.130. EImageC48 Class

The EImageC48 class is used to represent rectangular regions of interest inside EC48 color images. See ROIs.

Base Class:EROIC48

Namespace: Euresys.Open_eVision

Methods

EImageC48	Constructs a EImageC48 image.

InitializeFromUnalignedBuffer	Initialize image from an unaligned buffer.
operator=	Copies a EImageC48 image.

EImageC48.EImageC48

Constructs a EImageC48 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageC48(
 )
void EImageC48(
 int width,
 int height
 )
void EImageC48(
 int width,
 int height,
 Euresys.Open_eVision.EC48 constant
 )
void EImageC48(
 Euresys.Open_eVision.EImageC48 other
 )
```

Parameters

width
The width, in pixels.

height
The height, in pixels.

constant
Color constant.

other
Another EImageC48 object.

Remarks

The constructor with no arguments creates a zero-sized image. You can modify the image size by calling EBaseROI::SetSize method. The sizing constructor constructs an image of the given size. See EBaseROI::SetSize for informations about the sizing restrictions. The copy constructor copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object. Note that if you used EImageC48 to assign an external buffer to the image, that buffer will not be copied, the resulting image will just point to the same buffer as the original.

EImageC48.InitializeFromUnalignedBuffer

Initialize image from an unaligned buffer.

Namespace: Euresys.Open_eVision

```
[C#]
void InitializeFromUnalignedBuffer(
 int width,
 int height,
 IntPtr buffer,
 int pitch
 )
```

Parameters

width

Width of the image in the buffer.

height

Height of the image in the buffer.

buffer

Address of the buffer.

pitch

Pitch of the buffer (in bytes). If omitted, the method assumes there is no padding (the pitch is assumed be equal (width * sizeOfAPixel))

Remarks

The image will be initialized to fit the width and height passed as arguments. The contents of the buffer will then be copied into the image. The buffer contents must be compatible with the pixel type of the image.

EImageC48.operator=

Copies a EImageC48 image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC48 operator=(
 Euresys.Open_eVision.EImageC48 other
 )
```

Parameters

other

Another EImageC48 object.

Remarks

This method copies all the supplied image properties (content, attributes, sub-ROIs...) into the current object.

4.131. EImageEncoder Class

This class is responsible for the encoding of an image into an ECodedImage2 object.

Remarks

This class is responsible for the extraction of the runs in a source image, the aggregation of the runs into objects, as well as the proper handling of the continuous mode. It also provides methods to configure the image segmentation process.

The segmentation process classifies the pixels of the source image according to their value to create a set of layers. In each layer taken separately, the encoding process then assembles the connected pixels to build the coded elements (blobs).

By default, the segmentation method consists of grayscale single thresholding, with automatic threshold selection (as determined by the minimum residue rule).

Namespace: Euresys.Open_eVision

Properties

BinaryImageSegmenter	Returns a reference to the internal instance of the the segmenter for binary images, in order to set its parameters.
ColorRangeThresholdSegmenter	Returns a reference to the internal instance of the the segmenter for color-range thresholding, in order to set its parameters.
ColorSingleThresholdSegmenter	Returns a reference to the internal instance of the the segmenter for single color thresholding, in order to set its parameters.
ContinuousModeEnabled	Continuous mode enabling status.
ContinuousModeMaxHeight	Maximum number of rows that are kept in memory in the continuous mode.
EncodingConnexity	Connexity mode.
GrayscaleDoubleThresholdSegmenter	Returns a reference to the internal instance of the the segmenter for double color thresholding, in order to set its parameters.
GrayscaleSingleThresholdSegmenter	Returns a reference to the internal instance of the the segmenter for single grayscale thresholding, in order to set its parameters.
ImageRangeSegmenter	Returns a reference to the internal instance of the the segmenter for pixel-by-pixel, range-based thresholding, in order to set its parameters.
LabeledImageSegmenter	Returns a reference to the internal instance of the the segmenter thats maps the value of the pixels directly to a layer index, in order to set its parameters.
ReferenceImageSegmenter	Returns a reference to the internal instance of the the segmenter for single pixel-by-pixel thresholding, in order to set its parameters.
SegmentationMethod	Segmentation method used during the encoding.

Methods

CopyTo	-
EImageEncoder	Constructs an image encoder.
Encode	Encodes an image or an ROI as a coded image.
FlushContinuousMode	Resets the continuous mode, emptying the internal memory, after writing the objects that are not yet completed in a coded image.
Load	Loads the EImageEncoder. The given ESerializer must have been created for reading.
operator!=	Inequality operator.
operator=	-
operator==	Equality operator.
ResetContinuousMode	Resets the continuous mode, emptying the internal memory.
Save	Saves the EImageEncoder. The given ESerializer must have been created for writing.
Serialize	Serializes the EImageEncoder.

EImageEncoder.BinaryImageSegmenter

Returns a reference to the internal instance of the the segmenter for binary images, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.EBinaryImageSegmenter BinaryImageSegmenter
  { get; }
```

EImageEncoder.ColorRangeThresholdSegmenter

Returns a reference to the internal instance of the the segmenter for color-range thresholding, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.EColorRangeThresholdSegmenter
ColorRangeThresholdSegmenter
  { get; }
```

EImageEncoder.ColorSingleThresholdSegmenter

Returns a reference to the internal instance of the the segmenter for single color thresholding, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.EColorSingleThresholdSegmenter
ColorSingleThresholdSegmenter
    { get; }
```

EImageEncoder.ContinuousModeEnabled

Continuous mode enabling status.

Namespace: Euresys.Open_eVision

[C#]

```
bool ContinuousModeEnabled
    { get; set; }
```

Remarks

In the continuous mode, objects are constructed over a sequence of images: The image encoder encodes only the objects that contain no run touching the last row of the source image. The objects touching the inferior border of the image are not written in the coded image: These objects are indeed expected to continue in the subsequent image chunks. Such objects are kept in memory, and are consumed when analyzing the subsequent images.

EImageEncoder.ContinuousModeMaxHeight

Maximum number of rows that are kept in memory in the continuous mode.

Namespace: Euresys.Open_eVision

[C#]

```
uint ContinuousModeMaxHeight
    { get; set; }
```

Remarks

This property can be used to put a bound on the size of the internal memory of the image encoder in the continuous mode. If this property is set to zero, then memory can grow arbitrarily (there is no maximum number of rows).

EImageEncoder.CopyTo

-

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.EImageEncoder other
 )
```

Parameters

other

-

EImageEncoder.EImageEncoder

Constructs an image encoder.

Namespace: Euresys.Open_eVision

```
[C#]
void EImageEncoder(
 )
void EImageEncoder(
 Euresys.Open_eVision.EImageEncoder other
 )
```

Parameters

other

-

EImageEncoder.Encode

This method is deprecated.

Encodes an image or an ROI as a coded image.

Namespace: Euresys.Open_eVision

```
[C#]
void Encode(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
```

```
void Encode(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW1 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIBW8 inputMask,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void Encode(
 Euresys.Open_eVision.EROIBW16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
```

```
void Encode(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
```

Parameters

sourceImage

The input image that is to be encoded.

codedImage

The coded image that will hold the result of the encoding process.

inputMask

The possible input Flexible Mask that restricts the encoding. The input mask is a grayscale image having the same height and the same width as the source image. Any pixel in the source image that is covered by a value of 0 in the input mask will not get encoded in any layer. Any other pixel value in the input mask causes the pixel to be a candidate for the encoding.

region

Region of the input image that is to be encoded.

Remarks

The previous content of the result coded image is discarded.

EImageEncoder.EncodingConnexity

Connexity mode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EEncodingConnexity EncodingConnexity
  { get; set; }
```

Remarks

The connexity mode specifies the conditions that must hold for neighboring pixels to belong to the same object.

EImageEncoder.FlushContinuousMode

Resets the continuous mode, emptying the internal memory, after writing the objects that are not yet completed in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void FlushContinuousMode(
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
```

Parameters

codedImage

The coded image in which the not-yet-completed objects are written.

EImageEncoder.GrayscaleDoubleThresholdSegmenter

Returns a reference to the internal instance of the the segmenter for double color thresholding, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.EGrayscaleDoubleThresholdSegmenter
GrayscaleDoubleThresholdSegmenter
  { get; }
```

EImageEncoder.GrayscaleSingleThresholdSegmenter

Returns a reference to the internal instance of the the segmenter for single grayscale thresholding, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.EGrayscaleSingleThresholdSegmenter
GrayscaleSingleThresholdSegmenter
  { get; }
```

EImageEncoder.ImageRangeSegmenter

Returns a reference to the internal instance of the the segmenter for pixel-by-pixel, range-based thresholding, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.EImageRangeSegmenter ImageRangeSegmenter
  { get; }
```

EImageEncoder.LabeledImageSegmenter

Returns a reference to the internal instance of the the segmenter thats maps the value of the pixels directly to a layer index, in order to set its parameters.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.Segmenters.ELabeledImageSegmenter LabeledImageSegmenter
  { get; }
```

EImageEncoder.Load

Loads the EImageEncoder. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EImageEncoder.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EImageEncoder other
 )
```

Parameters

other
Other image encoder to compare with

EImageEncoder.operator=

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageEncoder operator=(
 Euresys.Open_eVision.EImageEncoder other
 )
```

Parameters

other

-

EImageEncoder.operator==

Equality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EImageEncoder other
 )
```

Parameters

other

Other image encoder to compare with

EImageEncoder.ReferenceImageSegmenter

Returns a reference to the internal instance of the the segmenter for single pixel-by-pixel thresholding, in order to set its parameters.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.Segmenters.EReferenceImageSegmenter ReferenceImageSegmenter
  { get; }
```

EImageEncoder.ResetContinuousMode

Resets the continuous mode, emptying the internal memory.

Namespace: Euresys.Open_eVision

[C#]

```
void ResetContinuousMode(
 )
```

EImageEncoder.Save

Saves the EImageEncoder. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EImageEncoder.SegmentationMethod

Segmentation method used during the encoding.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESegmentationMethod SegmentationMethod
  { get; set; }
```

EImageEncoder.Serialize

Serializes the EImageEncoder.

Namespace: Euresys.Open_eVision

[C#]

```
void Serialize(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Serializer

4.132. EImageRangeSegmenter Class

Segments an image using a pixel-by-pixel double threshold given as two images.

Remarks

This segmenter is applicable to EROIBW8, EROIBW16 and EROIC24 images. It produces coded images with two layers. The low threshold and the high threshold are defined for each pixel individually by means of two reference images of the same type as the source image: the Low Image and the High Image.

For grayscales images, the White layer (usually, with index 1) contains unmasked pixels having a gray value in a range defined by the gray value of the corresponding unmasked pixels in the Low Image and the High Image.

For RGB color images, the White layer (usually, with index 1) contains unmasked pixels having a color inside the cube of the color space defined by the colors of the corresponding unmasked pixels in the Low Image and the High Image.

The Black layer (usually, with index 0) contains the remaining unmasked pixels.

Base Class:ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

BlackLayerEncoded	Black layer encoding status.
BlackLayerIndex	Index of the black layer in the destination coded image.
HighImageBW16	High image for the segmentation of EROIBW16 images.
HighImageBW8	High image for the segmentation of EROIBW8 images.
HighImageC24	High image for the segmentation of EROIC24 images.
LowImageBW16	Low image for the segmentation of EROIBW16 images.
LowImageBW8	Low image for the segmentation of EROIBW8 images.
LowImageC24	Low image for the segmentation of EROIC24 images.
WhiteLayerEncoded	White layer encoding status.
WhiteLayerIndex	Index of the white layer in the destination coded image.

Methods

Load	Load the EImageRangeSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.

Save	Save the EImageRangeSegmenter configuration. The given ESerializer must have been created for writing.

EImageRangeSegmenter.BlackLayerEncoded

Black layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
override bool BlackLayerEncoded
  { get; set; }
```

EImageRangeSegmenter.BlackLayerIndex

Index of the black layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
override uint BlackLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the black layer.

EImageRangeSegmenter.HighImageBW16

High image for the segmentation of EROIBW16 images.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
Euresys.Open_eVision.EROIBW16 HighImageBW16
  { get; set; }
```

EImageRangeSegmenter.HighImageBW8

High image for the segmentation of EROIBW8 images.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
Euresys.Open_eVision.EROIBW8 HighImageBW8
```

```
{ get; set; }
```

EImageRangeSegmenter.HighImageC24

High image for the segmentation of EROIC24 images.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EROIC24 HighImageC24
  { get; set; }
```

EImageRangeSegmenter.Load

Load the EImageRangeSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
: The file path.

serializer
: The serializer.

EImageRangeSegmenter.LowImageBW16

Low image for the segmentation of EROIBW16 images.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EROIBW16 LowImageBW16
  { get; set; }
```

EImageRangeSegmenter.LowImageBW8

Low image for the segmentation of EROIBW8 images.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EROIBW8 LowImageBW8
  { get; set; }
```

EImageRangeSegmenter.LowImageC24

Low image for the segmentation of EROIC24 images.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EROIC24 LowImageC24
  { get; set; }
```

EImageRangeSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
bool operator==(
 Euresys.Open_eVision.Segmenters.EImageRangeSegmenter other
 )
```

Parameters

other

Other segmenter to compare to

EImageRangeSegmenter.Save

Save the EImageRangeSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EImageRangeSegmenter.WhiteLayerEncoded

White layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
override bool WhiteLayerEncoded
  { get; set; }
```

EImageRangeSegmenter.WhiteLayerIndex

Index of the white layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
override uint WhiteLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the white layer.

4.133. EImageSegmenter Class

Base class from which all the segmenters derive.

Derived Class (es): ELabeledImageSegmenter EThreeLayersImageSegmenter ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

4.134. EIntegerRange Class

Represents a range of integer values.

Namespace: Euresys.Open_eVision

Properties

Center	Center of the range.
LowerBound	Lower bound of the range.
Size	Size of the range.
UpperBound	Upper bound of the range.

Methods

EIntegerRange	Creates an EIntegerRange object.
IsInRange	Checks if a value is inside the range.
operator=	Assignment operator
SetBounds	Sets the bounds of the range.
SetFromBaseAndAbsoluteTolerance	Sets the bounds of the range from a base value and an absolute tolerance from this base value.
SetFromBaseAndRelativeTolerance	Sets the bounds of the range from a base value and a relative tolerance from this base value.
Update	Updates the range. If the value passed is outside of the range bounds, they are modified so they include the value.

EIntegerRange.Center

Center of the range.

Namespace: Euresys.Open_eVision

[C#]

```
int Center
  { get; }
```

EIntegerRange.EIntegerRange

Creates an EIntegerRange object.

Namespace: Euresys.Open_eVision

[C#]

```
void EIntegerRange(
 )
void EIntegerRange(
 int min,
 int max
 )
void EIntegerRange(
 Euresys.Open_eVision.EIntegerRange range
 )
```

Parameters

min

Lower bound of the range.

max

Upper bound of the range.

range

Range to copy.

EIntegerRange.IsInRange

Checks if a value is inside the range.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsInRange(
 int value,
 bool lowerBoundInclusive,
 bool upperBoundInclusive
 )
bool IsInRange(
 float value,
 bool lowerBoundInclusive,
 bool upperBoundInclusive
 )
```

Parameters

value

Value to test.

lowerBoundInclusive

Indicates if the lower bound should be considered inside the range (true) or outside (false).

upperBoundInclusive

Indicates if the upper bound should be considered inside the range (true) or outside (false).

EIntegerRange.LowerBound

Lower bound of the range.

Namespace: Euresys.Open_eVision

[C#]

```
int LowerBound
  { get; }
```

EIntegerRange.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EIntegerRange operator=(
 Euresys.Open_eVision.EIntegerRange other
 )
```

Parameters

other

-

EIntegerRange.SetBounds

Sets the bounds of the range.

Namespace: Euresys.Open_eVision

[C#]

```
void SetBounds(
 int min,
 int max
 )
```

Parameters

min

Lower bound of the range.

max

Upper bound of the range.

EIntegerRange.SetFromBaseAndAbsoluteTolerance

Sets the bounds of the range from a base value and an absolute tolerance from this base value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromBaseAndAbsoluteTolerance(
 int baseValue,
 int tolerance
 )
```

Parameters

baseValue

Base value.

tolerance

Absolute tolerance around the base value. Must be positive.

Remarks

The range will be set with a lower bound of (base - tolerance) and an upper bound of (base + tolerance).

EIntegerRange.SetFromBaseAndRelativeTolerance

Sets the bounds of the range from a base value and a relative tolerance from this base value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromBaseAndRelativeTolerance(
 int baseValue,
 float tolerance
 )
```

Parameters

baseValue

Base value.

tolerance

Relative tolerance around the base value. Must be positive.

Remarks

The range will be set with a lower bound of (base - (base * tolerance)) and an upper bound of (base + (base * tolerance)).

EIntegerRange.Size

Size of the range.

Namespace: Euresys.Open_eVision

[C#]

```
int Size
  { get; }
```

EIntegerRange.Update

Updates the range. If the value passed is outside of the range bounds, they are modified so they include the value.

Namespace: Euresys.Open_eVision

[C#]

```
void Update(
 int value
 )
```

Parameters

value

Value to be included in the range.

EIntegerRange.UpperBound

Upper bound of the range.

Namespace: Euresys.Open_eVision

[C#]

```
int UpperBound
  { get; }
```

4.135. EInterestPointLocator Class

EasyLocate tool - interest point version.

The EInterestPointLocator locates and classifies objects (or defects). With this class, an object is defined by its position it and a label (see ELocatorObject class). The tool must be trained using a dataset with annotated objects.
The minimum size resolution supported by the tool is 128. The maximum size of the image supported is 500 000 pixels.
The tool has 5 main parameters:
- The object size (EInterestPointLocator::ObjectSize) to indicate an approximate size for the interest point that you want to detect.
- A detection threshold (ELocatorBase::DetectionThreshold) to accept or reject predicted objects based on their score.
- The maximum number of objects in an image (ELocatorBase::MaxNumberOfObjects)
- The maximum proximity or the minimum distance between predicted objects with the same label (EInterestPointLocator::SameLabelMinDistance, ELocatorBase::SameLabelMaxObjectProximity).
- The maximum proximity or the minimum distance between predicted objects regardless of their label (EInterestPointLocator::AbsoluteMinDistance, ELocatorBase::AbsoluteMaxObjectProximity).

The proximity is defined as max(0, EInterestPointLocator::ObjectSize - d) / (EInterestPointLocator::ObjectSize + d) where d is the manhattan distance.
Except for the EInterestPointLocator::ObjectSize, all the parameters can be changed before and after training the tool.

Base Class:ELocatorBase

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AbsoluteMinDistance	Minimum distance between two predicted objects regardless of their label. This value must be between 0 and EInterestPointLocator::ObjectSize. It is internally converted to ELocatorBase::AbsoluteMaxObjectProximity. Default value: 0.
ObjectSize	Specify the size of predicted objects when only the position is predicted. This parameter is only used to prepare the predicted objects for drawing.
SameLabelMinDistance	Minimum distance between two predicted objects with the same label. This value must be between 0 and EInterestPointLocator::ObjectSize. It is internally converted to ELocatorBase::SameLabelMaxObjectProximity. Default value: EInterestPointLocator::ObjectSize / 3.
ToolType	Type of the deep learning tool.

Methods

EInterestPointLocator	Constructs a EInterestPointLocator object.
operator=	Assignment operator
SerializeSettings	Serializes the settings of the locator.

EInterestPointLocator.AbsoluteMinDistance

Minimum distance between two predicted objects regardless of their label.
This value must be between 0 and EInterestPointLocator::ObjectSize. It is internally converted to ELocatorBase::AbsoluteMaxObjectProximity. Default value: 0.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AbsoluteMinDistance
  { get; set; }
```

EInterestPointLocator.EInterestPointLocator

Constructs a EInterestPointLocator object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EInterestPointLocator(
 )
void EInterestPointLocator(
 int objectSize
 )
void EInterestPointLocator(
 Euresys.Open_eVision.EasyDeepLearning.EInterestPointLocator other
 )
```

Parameters

objectSize
Size of the interest point

other
Reference to the EInterestPointLocator object that should be copied

EInterestPointLocator.ObjectSize

Specify the size of predicted objects when only the position is predicted. This parameter is only used to prepare the predicted objects for drawing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int ObjectSize
  { get; set; }
```

EInterestPointLocator.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EInterestPointLocator operator=(
 Euresys.Open_eVision.EasyDeepLearning.EInterestPointLocator other
 )
```

Parameters

other

Reference to the EInterestPointLocator object that should be copied

EInterestPointLocator.SameLabelMinDistance

Minimum distance between two predicted objects with the same label.
This value must be between 0 and EInterestPointLocator::ObjectSize. It is internally converted to ELocatorBase::SameLabelMaxObjectProximity. Default value: EInterestPointLocator::ObjectSize / 3.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SameLabelMinDistance
  { get; set; }
```

EInterestPointLocator.SerializeSettings

Serializes the settings of the locator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

EInterestPointLocator.ToolType

Type of the deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
override Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType ToolType
  { get; }
```

4.136. EKernel Class

Kernel for use in convolution operations.

Namespace: Euresys.Open_eVision

Properties

Gain	Global gain.
Offset	Global offset (a constant added to the convolution result).
OutsideValue	Out-of-limits image value (only influences the result along image edges).
RawDataPtr	Pointer to the upper left convolution coefficient.
Rectifier	Rectification mode. This property allows specifying how negative convolution result values are handled.
SizeX	Number of coefficients along a row.
SizeY	Number of coefficients along a column.

Methods

EKernel	Constructs an EKernel object.
GetKernelData	Returns the convolution coefficient of given indices.
SetKernelData	Sets the convolution coefficient values at the given indices.
SetSize	Sets the number of coefficients along a row and along a column.

EKernel.EKernel

Constructs an EKernel object.

Namespace: Euresys.Open_eVision

```
[C#]
void EKernel(
 )
void EKernel(
 short sizeX,
 short sizeY,
 float gain,
 uint offset,
 Euresys.Open_eVision.EKernelRectifier rectifier,
 uint outsideValue
 )
void EKernel(
 Euresys.Open_eVision.EKernelType KernelType
 )
```

Parameters

sizeX
Number of coefficients along a row.

sizeY
Number of coefficients along a column.

gain
Global gain.

offset
Global offset.

rectifier
Rectification mode, as defined by EKernelRectifier.

outsideValue
Out-of-limits image value.

KernelType
Kernel type, as defined by EKernelType.

Remarks

The default constructor constructs a void kernel. A void kernel has no associated convolution coefficients. The sizing constructor constructs a kernel of given size and global parameters. The third constructor constructs a kernel of a predefined type.

EKernel.Gain

Global gain.

Namespace: Euresys.Open_eVision

[C#]

```
float Gain
  { get; set; }
```

Remarks

Before the global gain is applied, the coefficients are normalized so that their sum equals one, unless their sum equals zero (as is the case for a derivation operator). The rectification enables to handle the negative values that may appear after convolution.

EKernel.GetKernelData

Returns the convolution coefficient of given indices.

Namespace: Euresys.Open_eVision

[C#]

```
void GetKernelData(
 int columnIndex,
 int rowIndex,
 out float coefficientValue
 )
```

Parameters

columnIndex

Column index, from 0 on, increasing rightwards.

rowIndex

Row index, from 0 on, increasing downwards.

coefficientValue

Reference to the coefficient value.

EKernel.Offset

Global offset (a constant added to the convolution result).

Namespace: Euresys.Open_eVision

[C#]

```
uint Offset
  { get; set; }
```

EKernel.OutsideValue

Out-of-limits image value (only influences the result along image edges).

Namespace: Euresys.Open_eVision

[C#]

```
uint OutsideValue
  { get; set; }
```

EKernel.RawDataPtr

Pointer to the upper left convolution coefficient.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr RawDataPtr
  { get; }
```

Remarks

This pointer is actually the base address of a float array containing all coefficients.

EKernel.Rectifier

Rectification mode. This property allows specifying how negative convolution result values are handled.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EKernelRectifier Rectifier
  { get; set; }
```

EKernel.SetKernelData

Sets the convolution coefficient values at the given indices.

Namespace: Euresys.Open_eVision

[C#]

```
void SetKernelData(
 int columnIndex,
 int rowIndex,
 float coefficientValue
 )
```

```
void SetKernelData(
 float coefficientValue00,
 float coefficientValue10,
 float coefficientValue20,
 float coefficientValue01,
 float coefficientValue11,
 float coefficientValue21,
 float coefficientValue02,
 float coefficientValue12,
 float coefficientValue22
 )
void SetKernelData(
 float coefficientValue00,
 float coefficientValue10,
 float coefficientValue20,
 float coefficientValue30,
 float coefficientValue40,
 float coefficientValue01,
 float coefficientValue11,
 float coefficientValue21,
 float coefficientValue31,
 float coefficientValue41,
 float coefficientValue02,
 float coefficientValue12,
 float coefficientValue22,
 float coefficientValue32,
 float coefficientValue42,
 float coefficientValue03,
 float coefficientValue13,
 float coefficientValue23,
 float coefficientValue33,
 float coefficientValue43,
 float coefficientValue04,
 float coefficientValue14,
 float coefficientValue24,
 float coefficientValue34,
 float coefficientValue44
 )
```

```
void SetKernelData(
 float coefficientValue00,
 float coefficientValue10,
 float coefficientValue20,
 float coefficientValue30,
 float coefficientValue40,
 float coefficientValue50,
 float coefficientValue60,
 float coefficientValue01,
 float coefficientValue11,
 float coefficientValue21,
 float coefficientValue31,
 float coefficientValue41,
 float coefficientValue51,
 float coefficientValue61,
 float coefficientValue02,
 float coefficientValue12,
 float coefficientValue22,
 float coefficientValue32,
 float coefficientValue42,
 float coefficientValue52,
 float coefficientValue62,
 float coefficientValue03,
 float coefficientValue13,
 float coefficientValue23,
 float coefficientValue33,
 float coefficientValue43,
 float coefficientValue53,
 float coefficientValue63,
 float coefficientValue04,
 float coefficientValue14,
 float coefficientValue24,
 float coefficientValue34,
 float coefficientValue44,
 float coefficientValue54,
 float coefficientValue64,
 float coefficientValue05,
 float coefficientValue15,
 float coefficientValue25,
 float coefficientValue35,
 float coefficientValue45,
 float coefficientValue55,
 float coefficientValue65,
 float coefficientValue06,
 float coefficientValue16,
 float coefficientValue26,
 float coefficientValue36,
 float coefficientValue46,
 float coefficientValue56,
 float coefficientValue66
 )
```

Parameters

columnIndex
Column index, from 0 on, increasing rightwards.

rowIndex
Row index, from 0 on, increasing downwards.

coefficientValue
New coefficientValue.

coefficientValue00
Coefficient value at corresponding column and row indices.

coefficientValue10
Coefficient value at corresponding column and row indices.

coefficientValue20
Coefficient value at corresponding column and row indices.

coefficientValue01
Coefficient value at corresponding column and row indices.

coefficientValue11
Coefficient value at corresponding column and row indices.

coefficientValue21
Coefficient value at corresponding column and row indices.

coefficientValue02
Coefficient value at corresponding column and row indices.

coefficientValue12
Coefficient value at corresponding column and row indices.

coefficientValue22
Coefficient value at corresponding column and row indices.

coefficientValue30
Coefficient value at corresponding column and row indices.

coefficientValue40
Coefficient value at corresponding column and row indices.

coefficientValue31
Coefficient value at corresponding column and row indices.

coefficientValue41
Coefficient value at corresponding column and row indices.

coefficientValue32
Coefficient value at corresponding column and row indices.

coefficientValue42
Coefficient value at corresponding column and row indices.

coefficientValue03
Coefficient value at corresponding column and row indices.

coefficientValue13
Coefficient value at corresponding column and row indices.

coefficientValue23
Coefficient value at corresponding column and row indices.

coefficientValue33
Coefficient value at corresponding column and row indices.
coefficientValue43
Coefficient value at corresponding column and row indices.
coefficientValue04
Coefficient value at corresponding column and row indices.
coefficientValue14
Coefficient value at corresponding column and row indices.
coefficientValue24
Coefficient value at corresponding column and row indices.
coefficientValue34
Coefficient value at corresponding column and row indices.
coefficientValue44
Coefficient value at corresponding column and row indices.
coefficientValue50
Coefficient value at corresponding column and row indices.
coefficientValue60
Coefficient value at corresponding column and row indices.
coefficientValue51
Coefficient value at corresponding column and row indices.
coefficientValue61
Coefficient value at corresponding column and row indices.
coefficientValue52
Coefficient value at corresponding column and row indices.
coefficientValue62
Coefficient value at corresponding column and row indices.
coefficientValue53
Coefficient value at corresponding column and row indices.
coefficientValue63
Coefficient value at corresponding column and row indices.
coefficientValue54
Coefficient value at corresponding column and row indices.
coefficientValue64
Coefficient value at corresponding column and row indices.
coefficientValue05
Coefficient value at corresponding column and row indices.
coefficientValue15
Coefficient value at corresponding column and row indices.
coefficientValue25
Coefficient value at corresponding column and row indices.
coefficientValue35
Coefficient value at corresponding column and row indices.
coefficientValue45
Coefficient value at corresponding column and row indices.

coefficientValue55
Coefficient value at corresponding column and row indices.
coefficientValue65
Coefficient value at corresponding column and row indices.
coefficientValue06
Coefficient value at corresponding column and row indices.
coefficientValue16
Coefficient value at corresponding column and row indices.
coefficientValue26
Coefficient value at corresponding column and row indices.
coefficientValue36
Coefficient value at corresponding column and row indices.
coefficientValue46
Coefficient value at corresponding column and row indices.
coefficientValue56
Coefficient value at corresponding column and row indices.
coefficientValue66
Coefficient value at corresponding column and row indices.

Remarks

The function can also set the coefficient values for 3x3, 5x5 and 7x7 kernels.

EKernel.SetSize

Sets the number of coefficients along a row and along a column.

Namespace: Euresys.Open_eVision

```
[C#]
void SetSize(
 short n16SizeX,
 short n16SizeY
 )
```

Parameters

n16SizeX
The number of coefficients along a row.
n16SizeY
The number of coefficients along a column.

EKernel.SizeX

Number of coefficients along a row.

Namespace: Euresys.Open_eVision

[C#]

```
short SizeX
  { get; }
```

EKernel.SizeY

Number of coefficients along a column.

Namespace: Euresys.Open_eVision

[C#]

```
short SizeY
  { get; }
```

4.137. ELabeledImageSegmenter Class

Segments an image by mapping the value of the pixels directly to a layer index.

Remarks

This segmenter is applicable to EROIBW8 and EROIBW16 grayscale images. It produces coded images with a varying number of layers. The layer with index N contains all the unmasked pixels having a gray value equal to N.

By default, the segmentation is restricted to the range of layers whose index is between 0 and 255 (inclusive). This default range can be changed through ELabeledImageSegmenter::MinLayer and ELabeledImageSegmenter::MaxLayer.

Base Class:EImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

MaxLayer	High index of the range of layers to be encoded.
MinLayer	Low index of the range of layers to be encoded.

Methods

Load	Load the ELabeledImageSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the ELabeledImageSegmenter configuration. The given ESerializer must have been created for writing.

ELabeledImageSegmenter.Load

Load the ELabeledImageSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ELabeledImageSegmenter.MaxLayer

High index of the range of layers to be encoded.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EBW16 MaxLayer
  { get; set; }
```

ELabeledImageSegmenter.MinLayer

Low index of the range of layers to be encoded.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EBW16 MinLayer
  { get; set; }
```

ELabeledImageSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
bool operator==(
 Euresys.Open_eVision.Segmenters.ELabeledImageSegmenter other
 )
```

Parameters

other

Other segmenter to compare to.

ELabeledImageSegmenter.Save

Save the ELabeledImageSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

4.138. ELandmark Class

The landmark descriptor class.

Namespace: Euresys.Open_eVision

Properties

SensorX	The X value of the sensor coordinate pair of the landmark.
SensorY	Gets the Y value of the sensor coordinate pair of the landmark.
WorldX	Gets the X value of the world coordinate pair of the landmark.
WorldY	Gets the Y value of the world coordinate pair of the landmark.

Methods

ELandmark	Constructs a ELandmark object.
operator=	Assignement operator.

ELandmark.ELandmark

Constructs a ELandmark object.

Namespace: Euresys.Open_eVision

```
[C#]
void ELandmark(
 )
```

ELandmark.operator=

Assignement operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ELandmark operator=(
 Euresys.Open_eVision.ELandmark other
 )
```

Parameters

other

ELandmark object to copy.

ELandmark.SensorX

The X value of the sensor coordinate pair of the landmark.

Namespace: Euresys.Open_eVision

```
[C#]
float SensorX
  { get; set; }
```

ELandmark.SensorY

Gets the Y value of the sensor coordinate pair of the landmark.

Namespace: Euresys.Open_eVision

```
[C#]
float SensorY
  { get; set; }
```

ELandmark.WorldX

Gets the X value of the world coordinate pair of the landmark.

Namespace: Euresys.Open_eVision

```
[C#]
float WorldX
  { get; set; }
```

ELandmark.WorldY

Gets the Y value of the world coordinate pair of the landmark.

Namespace: Euresys.Open_eVision

```
[C#]
float WorldY
  { get; set; }
```

4.139. ELaserLineExtractor Class

Manages a laser line extraction context.

Namespace: Euresys.Open_eVision.Easy3D

Properties

AnalysisMode	Analysis mode.
AnalysisThreshold	Analysis threshold. Set this value to eliminate noise.
DepthMap	Returns the current depth map.
EnableSmoothing	Enables or disables grayscale profile smoothing before extraction.
Profile	Returns the last extracted profile.

Methods

ELaserLineExtractor	Creates an ELaserLineExtractor object.
ExtractProfileFromFrame	Extracts a profile from a frame and adds it to the current depth map. Returns true if the depth map is complete and ready for further processing.
operator=	Assignment operator
SetSmoothingParameters	Sets the parameters of the smoothing kernel.

ELaserLineExtractor.AnalysisMode

Analysis mode.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EMaximumAnalysisMode AnalysisMode
  { get; set; }
```

ELaserLineExtractor.AnalysisThreshold

Analysis threshold. Set this value to eliminate noise.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
int AnalysisThreshold
  { get; set; }
```

Remarks

In the center of gravity (COG) analysis mode, this threshold is used to discriminate peaks and should be set accordingly.

ELaserLineExtractor.DepthMap

Returns the current depth map.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EDepthMap16 DepthMap
  { get; }
```

Remarks

Should be called only when the previous call to ExtractProfileFromFrame() returned true. Otherwise, the depth map returned will be incomplete.

ELaserLineExtractor.ELaserLineExtractor

Creates an ELaserLineExtractor object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ELaserLineExtractor(
 int frameWidth,
 int frameHeight,
 int numFramesPerMap,
 float zResolution
 )

void ELaserLineExtractor(
 Euresys.Open_eVision.Easy3D.ELaserLineExtractor other
 )
```

Parameters

frameWidth

Width of the frames from which the profiles will be extracted.

frameHeight

Height of the frames from which the profiles will be extracted.

numFramesPerMap

Number of frames (and thus profiles) to be used per depth map. Each extracted profile create a line in the depth map.

zResolution

Optional parameter for the Z resolution of the extracted profile.
With a value of 0, the resolution will be automatically calculated to maximize the sub-pixel accuracy.

other

The object that should be copied

ELaserLineExtractor.EnableSmoothing

Enables or disables grayscale profile smoothing before extraction.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableSmoothing
  { get; set; }
```

ELaserLineExtractor.ExtractProfileFromFrame

Extracts a profile from a frame and adds it to the current depth map.
Returns true if the depth map is complete and ready for further processing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ExtractProfileFromFrame(
 Euresys.Open_eVision.EROIBW8 frame
 )
```

Parameters

frame

Frame from which the profile will be extracted.

ELaserLineExtractor.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.ELaserLineExtractor operator=(
 Euresys.Open_eVision.Easy3D.ELaserLineExtractor other
 )
```

Parameters

other

The object that should be copied

ELaserLineExtractor.Profile

Returns the last extracted profile.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float[] Profile
  { get; }
```

Remarks

If a point could not be extracted, its value will be set to FLOAT_MAX.

ELaserLineExtractor.SetSmoothingParameters

Sets the parameters of the smoothing kernel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSmoothingParameters(
 int param0,
 int param1,
 int param2
 )
```

Parameters

param0

First kernel parameter.

param1

Second kernel parameter.

param2

Third kernel parameter.

Remarks

If enabled, the smoothing will be performed using the following formula: f[i] = (f[i-1] * param0) + (f[i] * param1) + (f[i+1] * param2).

4.140. ELine Class

Represents a model of a line segment.

Base Class:EFrame

Namespace: Euresys.Open_eVision

Properties

End	End point coordinates of the ELine object.
Length	Length of the ELine object.
Org	Origin point coordinates of the ELine object.

Methods

CopyTo	Copies all the data of the current ELine object into another ELine object and returns it.
ELine	Constructs a ELine object.
GetAngleBetweenLines	Computes the angle between two lines.

GetDistanceBetweenPointAndLine	Computes the distance between a point and a line.
GetIntersectionOfLines	Computes the intersection between two lines.
GetPoint	Returns the coordinates of a point along the line.
GetProjectionOfPointOnLine	Computes the projection of a point on a line.
Load	Load the ELine configuration. The given ESerializer must have been created for reading.
operator=	Copies all the data from another ELine object into the current ELine object
Save	Save the ELine configuration. The given ESerializer must have been created for writing.
SetFromOriginAndEnd	Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELine object.
SetFromTwoPoints	DEPRECATED (you should use ELine::SetFromOriginAndEnd) : Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELine object.

ELine.CopyTo

Copies all the data of the current ELine object into another ELine object and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.ELine other
 )

Euresys.Open_eVision.ELine CopyTo(
 Euresys.Open_eVision.ELine other
 )
```

Parameters

other

Pointer to the ELine object in which the current ELine object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ELine object will be created and returned.

ELine.ELine

Constructs a ELine object.

Namespace: Euresys.Open_eVision

[C#]

```
void ELine(
 )
void ELine(
 Euresys.Open_eVision.EPoint center,
 float length,
 float angle
 )
void ELine(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
void ELine(
 Euresys.Open_eVision.ELine other
 )
```

Parameters

center
Center coordinates of the line at its nominal position. The default value is (0,0).

length
Nominal length of the line. The default value is 100.

angle
Nominal rotation angle of the line. The default value is 0.

origin
Origin point coordinates of the line.

end
End point coordinates of the line.

other
Another ELine object to be copied in the new ELine object.

ELine.End

End point coordinates of the ELine object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint End
  { get; }
```

ELine.GetAngleBetweenLines

Computes the angle between two lines.

Namespace: Euresys.Open_eVision

```
[C#]
float GetAngleBetweenLines(
 Euresys.Open_eVision.ELine line1,
 Euresys.Open_eVision.ELine line2
 )
```

Parameters

line1

First line

line2

Second line

Remarks

The angle returned by this function is signed in the trigonometric sense, meaning that angle (1,2) = -angle(2,1).

ELine.GetDistanceBetweenPointAndLine

Computes the distance between a point and a line.

Namespace: Euresys.Open_eVision

```
[C#]
float GetDistanceBetweenPointAndLine(
 Euresys.Open_eVision.EPoint pt,
 Euresys.Open_eVision.ELine line,
 bool limited
 )
```

Parameters

pt

The point.

line

The line.

limited

Indicates if the line parameter should be considered as an infinite line or as a segment.

ELine.GetIntersectionOfLines

Computes the intersection between two lines.

Namespace: Euresys.Open_eVision

```
[C#]
int GetIntersectionOfLines(
 Euresys.Open_eVision.ELine line1,
 Euresys.Open_eVision.ELine line2,
 Euresys.Open_eVision.EPoint intersection,
 bool limited
 )
```

Parameters

line1

First line.

line2

Second line.

intersection

Found intersection.

limited

Indicates if the line parameters should be considered as infinite lines or as a segments.

Remarks

The function returns the number of intersections found. It will return -1 if the two lines are overlapping.

ELine.GetPoint

Returns the coordinates of a point along the line.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 float fraction
 )
```

Parameters

fraction

Point location expressed as a fraction of the line length (range [-1, +1]).

ELine.GetProjectionOfPointOnLine

Computes the projection of a point on a line.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetProjectionOfPointOnLine(
 Euresys.Open_eVision.EPoint pt,
 Euresys.Open_eVision.ELine line
 )
```

Parameters

pt

The point.

line

The line.

ELine.Length

Length of the ELine object.

Namespace: Euresys.Open_eVision

[C#]

```
float Length
  { get; set; }
```

Remarks

By default, the length of the line is 100, which means 100 pixels when the field of view is not calibrated, and 100 physical units in case of a calibrated field of view.

ELine.Load

Load the ELine configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ELine.operator=

Copies all the data from another ELine object into the current ELine object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ELine operator=(
 Euresys.Open_eVision.ELine other
 )
```

Parameters

other

ELine object to be copied

ELine.Org

Origin point coordinates of the ELine object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Org
  { get; }
```

ELine.Save

Save the ELine configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ELine.SetFromOriginAndEnd

Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELine object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOriginAndEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the line.

end

End point coordinates of the line.

ELine.SetFromTwoPoints

This method is deprecated.

DEPRECATED (you should use ELine::SetFromOriginAndEnd) : Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELine object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the line.

end

End point coordinates of the line.

4.141. ELineGauge Class

Manages a line fitting gauge.

Base Class:ELineShape

Namespace: Euresys.Open_eVision

Properties

Active	Sets the flag indicating whether the gauge is active or not.
AverageDistance	Average distance between the sampled points and the fitted model.
ClippingMode	Clipping mode, that allows to choose how the fitted segment length and center are computed.
FilteringThreshold	Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.
HVConstraint	Status of the restriction on the orientation of the point location gauge or model fitting sample paths.
KnownAngle	Flag indicating whether the slope of the line to be fitted is known or not.
Line	Sets the nominal position, length and rotation angle of the line fitting gauge, according to a known ELine object.
MeasuredLine	Information pertaining to the fitted line.
MinAmplitude	Offset added to the Threshold when a peak is to be detected.
MinArea	Minimum area value.
NumFilteringPasses	Number of filtering passes for a model fitting operation.
NumMeasuredPoints	Number of edge-crossing points along the sample path of the gauge that was inspected with the last call to ELineGauge::MeasureSample.
NumSamples	Number of sampled points during the model fitting operation.
NumSkipRanges	Number of skip ranges in the gauge after a call to ELineGauge::AddSkipRange.
NumValidSamples	Number of valid sample points remaining after a model fitting operation.
RectangularSamplingArea	Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.
SamplingStep	Approximate distance between sampled points during a model fitting operation.
Smoothing	Number of pixels used for the low-pass filtering operation.
Thickness	Number of parallel segments used to extract the data profile.
Threshold	Threshold level used to delimit significant peaks in the data profile.
Tolerance	Searching area half thickness of the line fitting gauge.
TransitionChoice	Transition choice.
TransitionIndex	Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.
TransitionType	Transition type.
Type	Shape type.
Valid	Flag indicating if at least one valid transition has been found.

Methods

AddSkipRange	Adds an item to the set of skip ranges and returns the index of the newly added range.
CopyTo	Copies all the data of the current ELineGauge object into another ELineGauge object, and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
ELineGauge	Constructs a line measurement context.
GetMeasuredPeak	Returns information pertaining to the default derivative peak, along one of the sample paths of the gauge.
GetMeasuredPoint	Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.
GetMinNumFitSamples	Returns the minimum number of samples required for fitting on each side of the shape.
GetSample	Allows to retrieve the sample points found along the line.
GetSkipRange	Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the ELineGauge::AddSkipRange method.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Measure	Triggers the point location or the model fitting operation.
MeasureSample	Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.
MeasureWithoutFitting	Triggers the point location without line fitting operation.
operator=	Compares the instance with another ELineGauge object and returns true if they are identical.
Plot	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
PlotWithCurrentPen	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
Process	Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.
RemoveAllSkipRanges	Removes all the skip ranges previously created by a call to ELineGauge::AddSkipRange.
RemoveSkipRange	After a call to ELineGauge::AddSkipRange, removes the skip range with the given index.

SetMinNumFitSamples	Sets the minimum number of samples required for fitting on each side of the shape.

ELineGauge.Active

Sets the flag indicating whether the gauge is active or not.

Namespace: Euresys.Open_eVision

```
[C#]
override bool Active
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying ELineGauge::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process. By default, the gauge is active (true).

ELineGauge.AddSkipRange

Adds an item to the set of skip ranges and returns the index of the newly added range.

Namespace: Euresys.Open_eVision

```
[C#]
uint AddSkipRange(
 uint start,
 uint end
 )
```

Parameters

start

Beginning of the skip range.

end

End of the skip range.

Remarks

The samples indices between start and end (including the boundaries) will be discarded during the measurement process. The ELineGauge::AddSkipRange method allows to define skip ranges in an ELineGauge. This means that, at measure time, samples belonging to these ranges will not be taken into account. A sample may belong to more than one skip range; to be discarded, a sample has to pertain to at least one range. Moreover, the skip ranges are allowed to overlap one another. The range is allowed to be reversed (i.e. end is not required to be greater than start). Also, start and end are not required to reference valid indices at the time of the call (i.e. the range may lie outside of the current return value for ELineGauge::NumSamples).

ELineGauge.AverageDistance

Average distance between the sampled points and the fitted model.

Namespace: Euresys.Open_eVision

[C#]

```
float AverageDistance
  { get; }
```

Remarks

Irrelevant in case of a point location operation.

ELineGauge.ClippingMode

Clipping mode, that allows to choose how the fitted segment length and center are computed.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EClippingMode ClippingMode
  { get; set; }
```

Remarks

By default, the clipping mode is CenteredNominal, which corresponds to the behavior appearing in Open eVision version 6.4 and before.

ELineGauge.CopyTo

Copies all the data of the current ELineGauge object into another ELineGauge object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.ELineGauge other,
 bool recursive
 )

Euresys.Open_eVision.ELineGauge CopyTo(
 Euresys.Open_eVision.ELineGauge other,
 bool recursive
 )
```

Parameters

other

Pointer to the ELineGauge object in which the current ELineGauge object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ELineGauge object will be created and returned.

ELineGauge.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y
 )
```

Parameters

x

Cursor current X coordinate.

y

Cursor current Y coordinate.

ELineGauge.Draw

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELineGauge.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELineGauge.ELineGauge

Constructs a line measurement context.

Namespace: Euresys.Open_eVision

```
[C#]
void ELineGauge(
 )
void ELineGauge(
 Euresys.Open_eVision.ELineGauge other
 )
```

Parameters

other

Another ELineGauge object to be copied in the new ELineGauge object.

Remarks

With the default constructor, all the parameters are initialized to their respective default values. With the copy constructor, the constructed line measurement context is based on a pre-existing ELineGauge object. The gauge children are also copied. Hierarchy copying through a copy constructor is always recursive. To disable this recursion, use instead the ELineGauge::CopyTo method.

ELineGauge.FilteringThreshold

Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

Namespace: Euresys.Open_eVision

```
[C#]
float FilteringThreshold
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation. During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).

ELineGauge.GetMeasuredPeak

Returns information pertaining to the default derivative peak, along one of the sample paths of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPeak GetMeasuredPeak(
 uint index
 )
```

Parameters

index

This argument must be left unchanged from its default value, i.e. ~0 (= 0xFFFFFFFF).

Remarks

ELineGauge::GetMeasuredPeak returns the information about the derivative peak that meets the following two requirements: 1. It lies on the sample path inspected with the last call to ELineGauge::MeasureSample, and 1. It is associated with the edge-crossing point along the latter sample path that is selected by the transition choice parameter (cf. ELineGauge::TransitionChoice).

Note. For this method to succeed, it is necessary to previously call ELineGauge::MeasureSample.

ELineGauge.GetMeasuredPoint

Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetMeasuredPoint(
 uint index
 )
```

Parameters

index

This argument must be left unchanged from its default value, i.e. ~0 (= 0xFFFFFFFF).

Remarks

These coordinates pertain to the world space; they are expressed in the reference frame to which the current ELineGauge object belongs. The gauging process uses a list of sample points to find the shape position and size that best fit a given image. These sample points are measured along the sample paths defined by the gauge geometry. ELineGauge::GetMeasuredPoint returns the coordinates of the sample point that meets the following two requirements: 1. It lies on the sample path inspected with the last call to ELineGauge::MeasureSample, and 1. Among all the sample points along the latter sample path, it is the one selected by the ELineGauge::TransitionChoice property.

Note. For this method to succeed, it is necessary to previously call ELineGauge::MeasureSample.

ELineGauge.GetMinNumFitSamples

Returns the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void GetMinNumFitSamples(
 out int side0,
 out int side1,
 out int side2,
 out int side3
 )
```

Parameters

side0

Minimum number of samples on the top side of the rectangle.

side1

Minimum number of samples on the left side of the rectangle.

side2

Minimum number of samples on the bottom side of the rectangle.

side3

Minimum number of samples on the right side of the rectangle.

Remarks

Irrelevant in case of a point location operation.

ELineGauge.GetSample

Allows to retrieve the sample points found along the line.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSample(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSample(
 Euresys.Open_eVision.ESamplePoint pt,
 uint index
 )
```

Parameters

pt

EPoint structure that will contain the sample position.

index

The sample index

Remarks

The method provides the sample point corresponding to the supplied index. The returned value corresponds to the sample validity.

ELineGauge.GetSkipRange

Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the ELineGauge::AddSkipRange method.

Namespace: Euresys.Open_eVision

[C#]

```
void GetSkipRange(
 uint index,
 out uint start,
 out uint end
 )
```

Parameters

index

Index of the skip range.

start

Beginning of the skip range.

end

End of the skip range.

Remarks

Start is guaranteed to be smaller or equal to end.

ELineGauge.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the daughters gauges handles have to be considered as well.

ELineGauge.HVConstraint

Status of the restriction on the orientation of the point location gauge or model fitting sample paths.

Namespace: Euresys.Open_eVision

```
[C#]
bool HVConstraint
  { get; set; }
```

Remarks

Sample paths are the point location gauges placed along the model to be fitted.

ELineGauge.KnownAngle

Flag indicating whether the slope of the line to be fitted is known or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool KnownAngle
  { get; set; }
```

Remarks

A line model to be fitted may have a well-known slope. It is possible to impose the value of this slope, thus removing one degree of freedom. The line fitting gauge slope is set by means of ELineGauge. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ELineGauge.Line

Sets the nominal position, length and rotation angle of the line fitting gauge, according to a known ELine object.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.ELine Line
  { get; set; }
```

ELineGauge.Measure

Triggers the point location or the model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Pointer to the source image.

region

Region to use with the source image.

Remarks

When this method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

ELineGauge.MeasuredLine

Information pertaining to the fitted line.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ELine MeasuredLine
  { get; }
```

Remarks

Use method EShape::GetFound to get the status of the measurement. ELineGauge::MeasuredLine returns a successful fitted line if EShape::GetFound is true, otherwise it returns the orginal (nominal) line.

ELineGauge.MeasureSample

Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint pathIndex
 )
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint pathIndex
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

pathIndex

Sample path index.

region

Region on which to measure.

Remarks

This method stores its results into a temporary variable inside the ELineGauge object.

ELineGauge.MeasureWithoutFitting

Triggers the point location without line fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Source image.

region

The region on which to measure.

Remarks

This method performs the actual measurement for each transition, but does not perform the line fitting. This means that individual samples will be available through the ELineGauge::GetSample method, but the gauge position will not be changed. Please note that the filtering will not be performed in this method, since it relies upon the fitting process. The filtering parameters will thus be unused.

ELineGauge.MinAmplitude

Offset added to the Threshold when a peak is to be detected.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinAmplitude
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value. To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected. When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

ELineGauge.MinArea

Minimum area value.

Namespace: Euresys.Open_eVision

```
[C#]
uint MinArea
  { get; set; }
```

Remarks

A transition is detected if its derivative peak reaches Threshold + MinAmplitude value, and then declared valid if the area between the peak curve and the horizontal at level Threshold reaches the MinArea value.

ELineGauge.NumFilteringPasses

Number of filtering passes for a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumFilteringPasses
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation. During a filtering pass, the points that are too distant from the model are discarded. During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious). By default (the number of filtering passes is 0), the outliers rejection process is disabled.

ELineGauge.NumMeasuredPoints

Number of edge-crossing points along the sample path of the gauge that was inspected with the last call to ELineGauge::MeasureSample.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumMeasuredPoints
  { get; }
```

Remarks

Note. For this method to succeed, it is necessary to previously call ELineGauge::MeasureSample.

ELineGauge.NumSamples

Number of sampled points during the model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation. After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

ELineGauge.NumSkipRanges

Number of skip ranges in the gauge after a call to ELineGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSkipRanges
  { get; }
```

ELineGauge.NumValidSamples

Number of valid sample points remaining after a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumValidSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation. After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

ELineGauge.operator=

Compares the instance with another ELineGauge object and returns true if they are identical.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ELineGauge operator=(
 Euresys.Open_eVision.ELineGauge other
 )
```

Parameters

other

ELineGauge object to be compared

ELineGauge.Plot

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void Plot(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )

void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )

void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.

height
Height of the plot.

originX
Origin point coordinates of the plot along the X axis.

originY
Origin point coordinates of the plot along the Y axis.

color
The color in which to draw the overlay.

Remarks

The sample path that is taken into considered is the one inspected with the last call to ELineGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call ELineGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELineGauge.PlotWithCurrentPen

This method is deprecated.

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

```
[C#]
void PlotWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.
height
Height of the plot.
originX
Origin point coordinates of the plot along the X axis.
originY
Origin point coordinates of the plot along the Y axis.

Remarks

The sample path that is taken into considered is the one inspected with the last call to ELineGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call ELineGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELineGauge.Process

Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.

Namespace: Euresys.Open_eVision

```
[C#]
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool daughters
 )
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 bool daughters
 )
```

Parameters

sourceImage
Pointer to the BW8 roi source image.
daughters
Flag indicating whether the daughters shapes inherit of the same behavior.
region
-

Remarks

When complex gauging is required, several gauges can be grouped together. Applying Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

ELineGauge.RectangularSamplingArea

Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.

Namespace: Euresys.Open_eVision

```
[C#]
bool RectangularSamplingArea
  { get; set; }
```

Remarks

By default, this flag is set to true: the sampling area always remains a rectangle. Setting this property is only useful when the thickness transition parameter is greater than 1. In fact, when thickness transition parameter is equal to 1, rectangle and parallelogram reduce to the same segment.

ELineGauge.RemoveAllSkipRanges

Removes all the skip ranges previously created by a call to ELineGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveAllSkipRanges(
 )
```

ELineGauge.RemoveSkipRange

After a call to ELineGauge::AddSkipRange, removes the skip range with the given index.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveSkipRange(
 uint index
 )
```

Parameters

index

Index of the skip range to remove, as returned by ELineGauge::AddSkipRange.

ELineGauge.SamplingStep

Approximate distance between sampled points during a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
float SamplingStep
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation. To fit a model, a series of point location operations are performed along the model. The point location gauges spacing is given by the sampling step. By default, the sampling step is set to 5, which means 5 pixels when the field of view is not calibrated, and 5 physical units in case of a calibrated field of view. Be aware that if the sampling step is too large, the number of sampled points along the model will not be sufficient enough to accurately locate it.

ELineGauge.SetMinNumFitSamples

Sets the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void SetMinNumFitSamples(
 int side0,
 int side1,
 int side2,
 int side3
 )
```

Parameters

side0

Required number of samples to correctly fit the line. The default value is 2. It is the only parameter taken into account.

side1

Not used.

side2

Not used.

side3

Not used.

Remarks

Irrelevant in case of a point location operation. When the ELineGauge::Measure method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

ELineGauge.Smoothing

Number of pixels used for the low-pass filtering operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint Smoothing
  { get; set; }
```

Remarks

To reduce the effect of noise, the profile data can be low-pass filtered along the point location gauge direction.

ELineGauge.Thickness

Number of parallel segments used to extract the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Thickness
  { get; set; }
```

Remarks

To reduce the effect of noise and/or strengthen a transition, several parallel profiles can be accumulated.

ELineGauge.Threshold

Threshold level used to delimit significant peaks in the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Threshold
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value. To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected. When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

ELineGauge.Tolerance

Searching area half thickness of the line fitting gauge.

Namespace: Euresys.Open_eVision

```
[C#]
float Tolerance
  { get; set; }
```

Remarks

By default, the searching area thickness of the line fitting gauge is 20 (2x10), which means 20 pixels when the field of view is not calibrated, and 20 physical units in case of a calibrated field of view.

ELineGauge.TransitionChoice

Transition choice.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionChoice TransitionChoice
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition. In case of NthFromBegin or NthFromEnd transition choice, set ELineGauge::TransitionIndex to specify the desired transition. By default, the selected transition corresponds to the one with the largest amplitude (LargestAmplitude).

ELineGauge.TransitionIndex

Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.

Namespace: Euresys.Open_eVision

```
[C#]
uint TransitionIndex
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition. By default, the first transition is retained (the index value is 0).

ELineGauge.TransitionType

Transition type.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ETransitionType TransitionType
  { get; set; }
```

Remarks

The type of a transition tells whether it crosses increasing or decreasing gray-level values. This helps discriminate between nearby edges of an object. By default, the searched transition type is indifferently a black to white or a white to black transition (BwOrWb).

ELineGauge.Type

Shape type.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

ELineGauge.Valid

Flag indicating if at least one valid transition has been found.

Namespace: Euresys.Open_eVision

[C#]

```
bool Valid
  { get; }
```

Remarks

A false value means that no measurement has been performed. A true value means that a transition was found along the sample path inspected with the last call to ELineGauge::MeasureSample, and thus a point has been measured.

4.142. ELineShape Class

Manages a line shape.

Base Class:EShape
Derived Class(es):ELineGauge
Namespace: Euresys.Open_eVision

Properties

Angle	Orientation of the shape.
Center	Center point of the frame.
CenterX	Abscissa of the origin point of the frame.
CenterY	Ordinate of the origin point of the frame.
End	End point coordinates of the ELineShape object.
Length	Length of the ELineShape object.
Line	Sets the nominal position, length and rotation angle of the line, according to a known ELine object.
Org	Origin point coordinates of the ELineShape object.
Scale	Horizontal sensor resolution, in pixels per unit.
Type	Shape type.

Methods

Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
CopyTo	Copies all the data of the current ELineShape object into another ELineShape object and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the shape.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
ELineShape	Constructs a ELineShape object.
GetPoint	Returns the coordinates of a point along the line.
HitTest	Checks if there is a handle under the cursor.
operator=	Assignment operator
SetCenterXY	Sets the center coordinates of a ELineShape object.
SetFromOriginAndEnd	Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELineShape object.
SetFromTwoPoints	DEPRECATED (you should use ELineShape::SetFromOriginAndEnd) : Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELineShape object.

ELineShape.Angle

Orientation of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

ELineShape.Center

Center point of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

ELineShape.CenterX

Abscissa of the origin point of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

ELineShape.CenterY

Ordinate of the origin point of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

ELineShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

```
[C#]
void Closest(
 )
```

ELineShape.CopyTo

Copies all the data of the current ELineShape object into another ELineShape object and returns it.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.ELineShape other,
 bool bRecursive
 )
Euresys.Open_eVision.ELineShape CopyTo(
 Euresys.Open_eVision.ELineShape dest,
 bool bRecursive
 )
```

Parameters

other

-

bRecursive

true if the children shapes have to be copied as well, false otherwise.

dest

Pointer to the ELineShape object in which the current ELineShape object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ELineShape object will be created and returned.

ELineShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

ELineShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELineShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELineShape.ELineShape

Constructs a ELineShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void ELineShape(
 )

void ELineShape(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )

void ELineShape(
 Euresys.Open_eVision.EPoint center,
 float length,
 float angle
 )
```

```
void ELineShape(
 Euresys.Open_eVision.ELineShape other
 )
```

Parameters

origin
Origin point coordinates of the line.

end
End point coordinates of the line.

center
Center coordinates of the line at its nominal position. The default value is (0,0).

length
Nominal length of the line. The default value is 100.

angle
Nominal rotation angle of the line. The default value is 0.

other
Another ELineShape object to be copied in the new ELineShape object.

ELineShape.End

End point coordinates of the ELineShape object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint End
  { get; }
```

ELineShape.GetPoint

Returns the coordinates of a point along the line.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetPoint(
 float fraction
 )
```

Parameters

fraction
Point location expressed as a fraction of the line length (range [-1, +1]).

ELineShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

ELineShape.Length

Length of the ELineShape object.

Namespace: Euresys.Open_eVision

```
[C#]
float Length
  { get; set; }
```

Remarks

By default, the length of the line is 100, which means 100 pixels when the field of view is not calibrated, and 100 physical units in case of a calibrated field of view.

ELineShape.Line

Sets the nominal position, length and rotation angle of the line, according to a known ELine object.

Namespace: Euresys.Open_eVision

```
[C#]
virtual Euresys.Open_eVision.ELine Line
  { get; set; }
```

ELineShape.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ELineShape operator=(
 Euresys.Open_eVision.ELineShape other
 )
```

Parameters

other

Reference to the ELineShape object used for the assignment

ELineShape.Org

Origin point coordinates of the ELineShape object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Org
  { get; }
```

ELineShape.Scale

Horizontal sensor resolution, in pixels per unit.

Namespace: Euresys.Open_eVision

[C#]

```
float Scale
  { get; set; }
```

ELineShape.SetCenterXY

Sets the center coordinates of a ELineShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the ELineShape object.

centerY

Center coordinates of the ELineShape object.

ELineShape.SetFromOriginAndEnd

Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELineShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOriginAndEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the line.

end

End point coordinates of the line.

ELineShape.SetFromTwoPoints

This method is deprecated.

DEPRECATED (you should use ELineShape::SetFromOriginAndEnd) : Sets the geometric parameters (center coordinates, length, and rotation angle) of a ELineShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the line.

end

End point coordinates of the line.

ELineShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

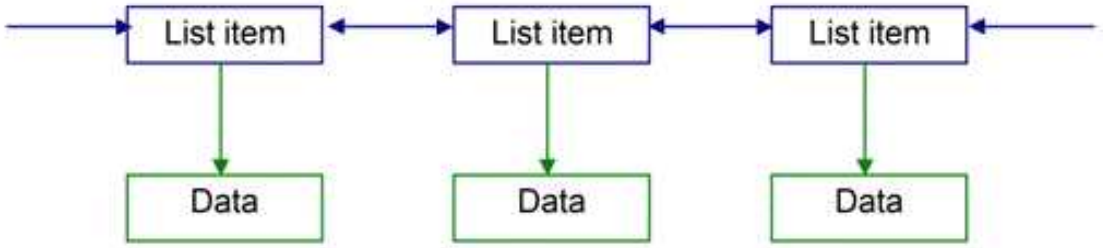
4.143. EListItem Class

This class is deprecated.

Describes list items. This class pertains to the EasyObject legacy API. Please use ECodedImage2 for all new developments instead.

Remarks

A list is a sequence of orderly list items. Each list item contains a pointer to a memory zone containing its data, a pointer to the previous list item, and a pointer to the next list item.



List itemsA few ECodedImage methods handle EListItem objects, or EListItem pointers. Runs listsECodedImage::GetFirstRunData, ECodedImage::GetFirstRunPtr, ECodedImage::GetLastRunData, ECodedImage::GetLastRunPtr, ECodedImage::GetPreviousRunData, ECodedImage::GetPreviousRunPtr, ECodedImage::GetNextRunData, ECodedImage::GetNextRunPtr These properties and methods allow to traverse the runs lists from the first run to the last, or from one run to its previous or next neighbor. A run can also be directly reached by its index within the list. The first run has index 0. The last run has index NumRuns-1. The ECodedImage::GetRunData and ECodedImage::GetRunDataPtr methods return the run data, or a pointer to the run data. Objects listsECodedImage::GetFirstObjData, ECodedImage::GetLastObjData, ECodedImage::GetPreviousObjData, ECodedImage::GetPreviousObjPtr, ECodedImage::GetNextObjData, ECodedImage::GetNextObjPtr These properties and methods allow to traverse the objects lists from the first object to the last, or from one object to its previous or next neighbor. An object can also be directly reached by its index within the list. The first object has index 0. The last object has index NumObjects-1. The ECodedImage::GetObjectData and ECodedImage::GetObjDataPtr methods return the object data, or a pointer to the object data.

Namespace: Euresys.Open_eVision

4.144. ELocator Class

EasyLocate tool - axis aligned bounding box version.

The ELocator locates and classifies objects (or defects). With this class, an object is defined by the axis-aligned bounding box that surrounds it and a label (see ELocatorObject class). The tool must be trained using a dataset with annotated objects.
The minimum size resolution supported by the tool is 128. The maximum size of the image supported is 500 000 pixels.
The tool has 5 main parameters:
- A set of anchors, i.e. pre-defined object size that it must be able to detect. The anchors can be automatically determined from the training dataset, specified manually using ELocator, or generated according to size information about the objects (see ELocator::GenerateAnchors).
- A detection threshold (ELocatorBase::DetectionThreshold) to accept or reject predicted objects based on their score.
- The maximum number of objects in an image (ELocatorBase::MaxNumberOfObjects)
- The maximum overlap between predicted objects with the same label (ELocator::SameLabelMaxOverlap, ELocatorBase::SameLabelMaxObjectProximity)
- The maximum overlap between predicted objects regardless of their label (ELocator::AbsoluteMaxOverlap, ELocatorBase::AbsoluteMaxObjectProximity).
Except for the anchors, all the parameters can be changed before and after training the tool.

Base Class:ELocatorBase

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AbsoluteMaxOverlap	Maximum overlap (intersection over union) between two predicted objects regardless of their label. The value of the parameter must be between 0 (no overlap allowed between two predicted objects with different labels) and 1 (full overlap allowed between two predicted objects with different labels). Default value: 1.
SameLabelMaxOverlap	Maximum overlap (intersection over union) between two predicted objects with the same label. The value of the parameter must be between 0 (no overlap allowed between two predicted objects with the same label) and 1 (full overlap allowed between two predicted objects with the same label). A low value will reduce the amount of falsely detected objects but may increase the number of missed objects. A high value will increase the number of falsely detected objects and reduce the number of missed objects. Default value: 0.5
ToolType	Type of the deep learning tool.

Methods

ELocator	Constructs a ELocator object.

GenerateAnchors	Generates anchors based on the objects in the dataset or a formal specification. For the version that takes a dataset, the properties ELocator and ELocator must be set.
operator=	Assignment operator
SerializeSettings	Serializes the settings of the locator.

ELocator.AbsoluteMaxOverlap

Maximum overlap (intersection over union) between two predicted objects regardless of their label.
The value of the parameter must be between 0 (no overlap allowed between two predicted objects with different labels) and 1 (full overlap allowed between two predicted objects with different labels).
Default value: 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AbsoluteMaxOverlap
  { get; set; }
```

Remarks

This parameter can be changed before and after training.

ELocator.ELocator

Constructs a ELocator object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ELocator(
 )
void ELocator(
 Euresys.Open_eVision.EasyDeepLearning.ELocator other
 )
```

Parameters

other

Reference to the ELocator object that should be copied

ELocator.GenerateAnchors

Generates anchors based on the objects in the dataset or a formal specification.
For the version that takes a dataset, the properties ELocator and ELocator must be set.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ESize[] GenerateAnchors(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
Euresys.Open_eVision.ESize[] GenerateAnchors(
 float minDimension,
 float maxDimension,
 int numSubScales,
 float[] aspectRatios
 )
```

Parameters

dataset

Dataset

minDimension

Minimum dimension of objects (minimum value: 16)

maxDimension

Maximum dimension of objects.

numSubScales

Number of sub-scales to produce for each scale covered by the given dimensions.

aspectRatios

Aspect ratios to generate at each scale. The aspect ratios are the ratios between the width and height of the anchor. Recommended value: {1.0f, 0.5f, 2.0f}.

Remarks

The dimension of an object corresponds to the square root of its area.

ELocator.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ELocator operator=(
 Euresys.Open_eVision.EasyDeepLearning.ELocator other
 )
```

Parameters

other

Reference to the ELocator object that should be copied

ELocator.SameLabelMaxOverlap

Maximum overlap (intersection over union) between two predicted objects with the same label.
The value of the parameter must be between 0 (no overlap allowed between two predicted objects with the same label) and 1 (full overlap allowed between two predicted objects with the same label). A low value will reduce the amount of falsely detected objects but may increase the number of missed objects. A high value will increase the number of falsely detected objects and reduce the number of missed objects.
Default value: 0.5

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SameLabelMaxOverlap
  { get; set; }
```

Remarks

This parameter is also used to compute the matching between ground truth and predicted objects during evaluation.
This parameter can be changed before and after training.

ELocator.SerializeSettings

Serializes the settings of the locator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer
Pointer to ESerializer

ELocator.ToolType

Type of the deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
override Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType ToolType
  { get; }
```

4.145. ELocatorBase Class

Base class for EasyLocate tool.
The children classes of this class differs by their prediction features (ELocatorFeature). The ground truth objects used to train must have the same set of features as the prediction.

Base Class:EDeepLearningTool

Derived Class(es):EInterestPointLocatorELocator

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AbsoluteMaxObjectProximity	Maximum proximity between two predicted objects regardless of their label. The value of the parameter can be between - 0 when the two objects are completely outside their respective zone of influence; and - 1 when the two predicted objects are the same. The actual implementation of the proximity depends on the type of locator tool. A low value will reduce the amount of falsely detected objects but may increase the number of missed objects. A high value will increase the number of falsely detected objects and reduce the number of missed objects. See also ELocator::AbsoluteMaxOverlap and EInterestPointLocator::AbsoluteMinDistance. Default value: 1.
Capacity	Capacity of the ELocatorBase. A higher capacity makes the supervised segmenter capable of learning more information at the cost of a slower processing speed.
Channels	Number of channels of input images. It can either be 1 for grayscale images or 3 for color images.
DetectionThreshold	Detection threshold. The detection threshold is set automatically during training to maximize accuracy. It can also be changed after training to obtain a different true positive/false positive tradeoff.
Height	Height of input images.
LocatorFeatures	The features supported by the locator.
MaxNumberOfObjects	Maximum number of objects in an image (default value: 100).
PredictionAnchors	Prediction anchors. The prediction anchors are a set of object bounding box sizes. Each anchor is used to detect objects with a size similar to that anchor. As such, the prediction anchors must reflect the variety of sizes of objects that must be detected.

SameLabelMaxObjectProximity	Maximum proximity between two predicted objects with the same label. The value of the parameter can be between - 0 when the two objects are completely outside their respective zone of influence; and - 1 when the two predicted objects are the same. The actual implementation of the proximity depends on the type of locator tool. A low value will reduce the amount of falsely detected objects but may increase the number of missed objects. A high value will increase the number of falsely detected objects and reduce the number of missed objects. See also ELocator::SameLabelMaxOverlap and EInterestPointLocator::SameLabelMinDistance. Default value: 0.5
Width	Width of input images.

Methods

Apply	Applies the tool on the given image and its mask region.
Evaluate	Evaluates the dataset.
GetTrainingMetrics	Training metrics at the given iteration
GetValidationMetrics	Validation metrics at the given iteration
HasFeature	Whether the given feature is enabled.
SerializeSettings	Serializes the settings of the locator.

ELocatorBase.AbsoluteMaxObjectProximity

Maximum proximity between two predicted objects regardless of their label.
The value of the parameter can be between
- 0 when the two objects are completely outside their respective zone of influence; and
- 1 when the two predicted objects are the same.
The actual implementation of the proximity depends on the type of locator tool.
A low value will reduce the amount of falsely detected objects but may increase the number of missed objects. A high value will increase the number of falsely detected objects and reduce the number of missed objects.
See also ELocator::AbsoluteMaxOverlap and EInterestPointLocator::AbsoluteMinDistance.
Default value: 1.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AbsoluteMaxObjectProximity
  { get; set; }
```

Remarks

This parameter can be changed before and after training.

ELocatorBase.Apply

Applies the tool on the given image and its mask region.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorResult Apply(
 Euresys.Open_eVision.EBaseROI img
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult Apply(
 Euresys.Open_eVision.EBaseROI img,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EImageBW8[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EImageBW8[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EImageBW16[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EImageBW16[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EImageC24[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EImageC24[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EBaseROI[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ELocatorResult[] Apply(
 Euresys.Open_eVision.EBaseROI[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )
```

Parameters

img
Image.

mask
Mask region of the image.

imgs
Vector of images.

masks
Vector of mask regions for the images.

ELocatorBase.Capacity

Capacity of the ELocatorBase.
A higher capacity makes the supervised segmenter capable of learning more information at the cost of a slower processing speed.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ELocatorCapacity Capacity
  { get; set; }
```

ELocatorBase.Channels

Number of channels of input images. It can either be 1 for grayscale images or 3 for color images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Channels
  { get; set; }
```

Remarks

If the locator tool is not trained or the value was not explicitely set, its value will be 0.

ELocatorBase.DetectionThreshold

Detection threshold. The detection threshold is set automatically during training to maximize accuracy. It can also be changed after training to obtain a different true positive/false positive tradeoff.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float DetectionThreshold
  { get; set; }
```

ELocatorBase.Evaluate

Evaluates the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorMetrics Evaluate(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

dataset

Dataset to evaluate

ELocatorBase.GetTrainingMetrics

Training metrics at the given iteration

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorMetrics GetTrainingMetrics(
 int iteration
 )
```

Parameters

iteration

Iteration at which to get the metrics

ELocatorBase.GetValidationMetrics

Validation metrics at the given iteration

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorMetrics GetValidationMetrics(
 int iteration
 )
```

Parameters

iteration

Iteration at which to get the metrics

ELocatorBase.HasFeature

Whether the given feature is enabled.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasFeature(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorFeature feature
 )
```

Parameters

feature

The feature to check

ELocatorBase.Height

Height of input images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Height
  { get; set; }
```

Remarks

If the locator tool is not trained or the value was not explicitely set, its value will be 0.

ELocatorBase.LocatorFeatures

The features supported by the locator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int LocatorFeatures
  { get; }
```

ELocatorBase.MaxNumberOfObjects

Maximum number of objects in an image (default value: 100).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int MaxNumberOfObjects
  { get; set; }
```

Remarks

The value of this parameter will be automatically changed when training if it is lower than the maximum number of objects in an image from the training dataset.
This parameter can be changed before and after training.

ELocatorBase.PredictionAnchors

Prediction anchors.
The prediction anchors are a set of object bounding box sizes. Each anchor is used to detect objects with a size similar to that anchor. As such, the prediction anchors must reflect the variety of sizes of objects that must be detected.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ESize[] PredictionAnchors
  { get; set; }
```

ELocatorBase.SameLabelMaxObjectProximity

Maximum proximity between two predicted objects with the same label.
The value of the parameter can be between
- 0 when the two objects are completely outside their respective zone of influence; and
- 1 when the two predicted objects are the same.
The actual implementation of the proximity depends on the type of locator tool.
A low value will reduce the amount of falsely detected objects but may increase the number of missed objects. A high value will increase the number of falsely detected objects and reduce the number of missed objects.
See also ELocator::SameLabelMaxOverlap and EInterestPointLocator::SameLabelMinDistance.
Default value: 0.5

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float SameLabelMaxObjectProximity
  { get; set; }
```

Remarks

This parameter is also used to compute the matching between ground truth and predicted objects during evaluation.
This parameter can be changed before and after training.

ELocatorBase.SerializeSettings

Serializes the settings of the locator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

ELocatorBase.Width

Width of input images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint Width
  { get; set; }
```

Remarks

If the locator tool is not trained or the value was not explicitely set, its value will be 0.

4.146. ELocatorMetrics Class

Collection of metrics used to evaluate the results of a ELocator tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AveragePrecision	Average Precision when matching prediction and ground truth with a minimum proximity of ELocatorBase::SameLabelMaxObjectProximity.
AveragePrecision50	Average precision when matching prediction and ground truth with a minimum "proximity" of 0.5.

AverageProximity	Average proximity of the predicted objects to the ground truth objects. This value is the average of ELocatorMetrics::GetLabelAverageProximity over all the labels.
DetectionThreshold	Threshold for detected objects.
Error	Error of the EasyLocate training algorithm (only available for the training metrics, see EDeepLearningTool).
FScore	F-Score (harmonic mean of ELocatorMetrics::Recall and ELocatorMetrics::Precision).
ImageAccuracy	Image accuracy: the proportion of images that are correctly detected to contain or not objects, regardless of their labels.
IntersectionOverUnion	Deprecated. Same as ELocatorMetrics::AverageProximity.
NumBadlyPredictedImagesWithObjects	Number of images with objects that are badly predicted as containing no object. This is the number of false negatives at the image level.
NumBadlyPredictedImagesWithoutObjects	Number of images without objects that are badly predicted as containing objects. This is the number of false positives a the image level.
NumCorrectlyPredictedImagesWithObjects	Number of images containing objects that are correctly predicted as containing objects, regardless of the labels of the objects. This is the number of true positives at the image level.
NumCorrectlyPredictedImagesWithoutObjects	Number of images without objects that are correctly predicted as containing no object. This is the number of true negatives at the image level.
NumLabels	Number of labels recognized by the ELocator tool that produced these metrics.
Precision	Precision (proportion of detected objects that are correct).
Recall	Recall (true positive rate, proportion of ground truth object that are correctly detected).

Methods

ELocatorMetrics	Constructs an ELocatorMetrics object.
GetBestWeightedFScore	Best weighted F-Score achievable by changing the detection threshold.
GetBestWeightedFScoreAndThreshold	Best weighted F-Score achievable with the corresponding threshold.
GetBestWeightedFScoreThreshold	Detection threshold that gives the best weighted F-Score (ELocatorMetrics).
GetBestWeightedPrecision	Best weighted precision achievable by changing the detection threshold.
GetBestWeightedPrecisionAndThreshold	Best weighted precision achievable with the corresponding threshold.
GetBestWeightedPrecisionThreshold	Detection threshold that gives the best weighted precision (ELocatorMetrics).

GetBestWeightedRecall	Best weighted recall achievable by changing the detection threshold.
GetBestWeightedRecallAndThreshold	Best weighted recall achievable with the corresponding threshold.
GetBestWeightedRecallThreshold	Detection threshold that gives the best weighted recall (ELocatorMetrics).
GetLabel	Label.
GetLabelAveragePrecision	Average precision for detection of objects from the given label.
GetLabelAverageProximity	Average proximity of the predicted objects of the given label to the ground truth objects.
GetLabelFScore	F-Score for the given label.
GetLabelIntersectionOverUnion	Deprecated. Same as ELocatorMetrics::GetLabelAverageProximity.
GetLabelPrecision	Precision for the given label.
GetLabelRecall	Recall for the given label.
GetNumCorrectlyDetectedObjects	Number of correctly detected objects. A correctly detected object is a predicted object that has a "proximity" higher than ELocatorBase::SameLabelMaxObjectProximity with a ground truth object of the same label. A label can be specified to obtain the number of correctly detected objects for that label. Otherwise, the number of correctly detected objects is for all the labels.
GetNumDetectedObjects	Number of detected objects. A label can be specified to obtain the number of detected objects for that label. Otherwise, the number of detected objects is for all the labels.
GetNumUndetectedObjects	Number of undetected objects. An undetected object is a ground truth object that is not matched to any predicted object of the same label with a proximity higher than ELocatorBase::SameLabelMaxObjectProximity. A label can be specified to obtain the number of undetected objects for that label. Otherwise, the number of undetected objects is for all the labels.
GetWeightedFScore	Weighted average of the F-Score for each label.
GetWeightedPrecision	Weighted average of the precision (proportion of detected objects that are correct) for each label.
GetWeightedRecall	Weighted average of the recall (true positive rate) for each label.
IsValid	Indicates whether the object contains at least one result.
Load	Loads a locator metric. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves a locator metric. The given ESerializer must have been created for writing.

ELocatorMetrics.AveragePrecision

Average Precision when matching prediction and ground truth with a minimum proximity of ELocatorBase::SameLabelMaxObjectProximity.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AveragePrecision
  { get; }
```

ELocatorMetrics.AveragePrecision50

Average precision when matching prediction and ground truth with a minimum "proximity" of 0.5.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AveragePrecision50
  { get; }
```

ELocatorMetrics.AverageProximity

Average proximity of the predicted objects to the ground truth objects.
This value is the average of ELocatorMetrics::GetLabelAverageProximity over all the labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AverageProximity
  { get; }
```

Remarks

Look at the documentation of ELocator and EInterestPointLocator for their definition of proximity.

ELocatorMetrics.DetectionThreshold

Threshold for detected objects.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float DetectionThreshold
  { get; set; }
```

ELocatorMetrics.ELocatorMetrics

Constructs an ELocatorMetrics object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ELocatorMetrics(
 )
void ELocatorMetrics(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorMetrics other
 )
```

Parameters

other

Reference to the ELocatorMetrics object that should be copied

ELocatorMetrics.Error

Error of the EasyLocate training algorithm (only available for the training metrics, see EDeepLearningTool).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Error
  { get; }
```

ELocatorMetrics.FScore

F-Score (harmonic mean of ELocatorMetrics::Recall and ELocatorMetrics::Precision).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float FScore
  { get; }
```

ELocatorMetrics.GetBestWeightedFScore

Best weighted F-Score achievable by changing the detection threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetBestWeightedFScore(
 )
float GetBestWeightedFScore(
 float[] weights
 )
```

Parameters

weights
Label weights

ELocatorMetrics.GetBestWeightedFScoreAndThreshold

Best weighted F-Score achievable with the corresponding threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void GetBestWeightedFScoreAndThreshold(
 ref float fScore,
 ref float threshold
 )
void GetBestWeightedFScoreAndThreshold(
 float[] weights,
 ref float fScore,
 ref float threshold
 )
```

Parameters

fScore
Best weighted F-Score achievable
threshold
Threshold that achieves the best weighted F-Score
weights
Label weights

ELocatorMetrics.GetBestWeightedFScoreThreshold

Detection threshold that gives the best weighted F-Score (ELocatorMetrics).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetBestWeightedFScoreThreshold(
 )
float GetBestWeightedFScoreThreshold(
 float[] weights
 )
```

Parameters

weights

Label weights

ELocatorMetrics.GetBestWeightedPrecision

Best weighted precision achievable by changing the detection threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetBestWeightedPrecision(
 )
float GetBestWeightedPrecision(
 float[] weights
 )
```

Parameters

weights

Label weights

ELocatorMetrics.GetBestWeightedPrecisionAndThreshold

Best weighted precision achievable with the corresponding threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void GetBestWeightedPrecisionAndThreshold(
 ref float precision,
 ref float threshold
 )
void GetBestWeightedPrecisionAndThreshold(
 float[] weights,
 ref float precision,
 ref float threshold
 )
```

Parameters

precision
Best weighted precision achievable

threshold
Threshold that achieves the best weighted precision

weights
Label weights

ELocatorMetrics.GetBestWeightedPrecisionThreshold

Detection threshold that gives the best weighted precision (ELocatorMetrics).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetBestWeightedPrecisionThreshold(
 )
float GetBestWeightedPrecisionThreshold(
 float[] weights
 )
```

Parameters

weights
Label weights

ELocatorMetrics.GetBestWeightedRecall

Best weighted recall achievable by changing the detection threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetBestWeightedRecall(
 )
float GetBestWeightedRecall(
 float[] weights
 )
```

Parameters

weights
Label weights

ELocatorMetrics.GetBestWeightedRecallAndThreshold

Best weighted recall achievable with the corresponding threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void GetBestWeightedRecallAndThreshold(
 ref float recall,
 ref float threshold
 )
void GetBestWeightedRecallAndThreshold(
 float[] weights,
 ref float recall,
 ref float threshold
 )
```

Parameters

recall

Best weighted recall achievable

threshold

Threshold that achieves the best weighted recall

weights

Label weights

ELocatorMetrics.GetBestWeightedRecallThreshold

Detection threshold that gives the best weighted recall (ELocatorMetrics).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetBestWeightedRecallThreshold(
 )
float GetBestWeightedRecallThreshold(
 float[] weights
 )
```

Parameters

weights

Label weights

ELocatorMetrics.GetLabel

Label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetLabel(
 int idx
 )
```

Parameters

idx

Index of the label.

ELocatorMetrics.GetLabelAveragePrecision

Average precision for detection of objects from the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelAveragePrecision(
 int labelIdx
 )
```

Parameters

labelIdx

Label index

ELocatorMetrics.GetLabelAverageProximity

Average proximity of the predicted objects of the given label to the ground truth objects.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelAverageProximity(
 int labelIdx
 )
```

Parameters

labelIdx

Index of the label.

Remarks

Look at the documentation of ELocator and EInterestPointLocator for their definition of proximity.

ELocatorMetrics.GetLabelFScore

F-Score for the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelFScore(
 string label
 )
float GetLabelFScore(
 int labelId
 )
```

Parameters

label
Label

labelId
Label index

ELocatorMetrics.GetLabelIntersectionOverUnion

This method is deprecated.

Deprecated. Same as ELocatorMetrics::GetLabelAverageProximity.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelIntersectionOverUnion(
 int labelIdx
 )
```

Parameters

labelIdx
Index of the label.

ELocatorMetrics.GetLabelPrecision

Precision for the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelPrecision(
 string label
 )
float GetLabelPrecision(
 int labelId
 )
```

Parameters

label

Label

labelId

Label index

ELocatorMetrics.GetLabelRecall

Recall for the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelRecall(
 string label
 )
float GetLabelRecall(
 int labelId
 )
```

Parameters

label

Label

labelId

Label index

ELocatorMetrics.GetNumCorrectlyDetectedObjects

Number of correctly detected objects.
A correctly detected object is a predicted object that has a "proximity" higher than ELocatorBase::SameLabelMaxObjectProximity with a ground truth object of the same label.
A label can be specified to obtain the number of correctly detected objects for that label.
Otherwise, the number of correctly detected objects is for all the labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint GetNumCorrectlyDetectedObjects(
 )
uint GetNumCorrectlyDetectedObjects(
 string label
 )
uint GetNumCorrectlyDetectedObjects(
 int labelId
 )
```

Parameters

label

Label

labelId

Index of the label

ELocatorMetrics.GetNumDetectedObjects

Number of detected objects.
A label can be specified to obtain the number of detected objects for that label. Otherwise, the number of detected objects is for all the labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint GetNumDetectedObjects(
 )
uint GetNumDetectedObjects(
 string label
 )
uint GetNumDetectedObjects(
 int labelId
 )
```

Parameters

label

Label

labelId

Index of the label

ELocatorMetrics.GetNumUndetectedObjects

Number of undetected objects.
An undetected object is a ground truth object that is not matched to any predicted object of the same label with a proximity higher than ELocatorBase::SameLabelMaxObjectProximity.
A label can be specified to obtain the number of undetected objects for that label. Otherwise, the number of undetected objects is for all the labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
uint GetNumUndetectedObjects(
 )
uint GetNumUndetectedObjects(
 string label
 )
uint GetNumUndetectedObjects(
 int labelId
 )
```

Parameters

label
Label

labelId
Index of the label

ELocatorMetrics.GetWeightedFScore

Weighted average of the F-Score for each label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetWeightedFScore(
 )
float GetWeightedFScore(
 float[] weights
 )
```

Parameters

weights
Label weights

ELocatorMetrics.GetWeightedPrecision

Weighted average of the precision (proportion of detected objects that are correct) for each label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetWeightedPrecision(
 )
float GetWeightedPrecision(
 float[] weights
 )
```

Parameters

weights

Label weights

ELocatorMetrics.GetWeightedRecall

Weighted average of the recall (true positive rate) for each label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetWeightedRecall(
 )
float GetWeightedRecall(
 float[] weights
 )
```

Parameters

weights

Label weights

ELocatorMetrics.ImageAccuracy

Image accuracy: the proportion of images that are correctly detected to contain or not objects, regardless of their labels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float ImageAccuracy
  { get; }
```

ELocatorMetrics.IntersectionOverUnion

This property is deprecated.

Deprecated. Same as ELocatorMetrics::AverageProximity.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float IntersectionOverUnion
  { get; }
```

ELocatorMetrics.IsValid

Indicates whether the object contains at least one result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

ELocatorMetrics.Load

Loads a locator metric. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

ELocatorMetrics.NumBadlyPredictedImagesWithObjects

Number of images with objects that are badly predicted as containing no object. This is the number of false negatives at the image level.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumBadlyPredictedImagesWithObjects
  { get; }
```

ELocatorMetrics.NumBadlyPredictedImagesWithoutObjects

Number of images without objects that are badly predicted as containing objects. This is the number of false positives a the image level.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumBadlyPredictedImagesWithoutObjects
  { get; }
```

ELocatorMetrics.NumCorrectlyPredictedImagesWithObjects

Number of images containing objects that are correctly predicted as containing objects, regardless of the labels of the objects. This is the number of true positives at the image level.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumCorrectlyPredictedImagesWithObjects
  { get; }
```

ELocatorMetrics.NumCorrectlyPredictedImagesWithoutObjects

Number of images without objects that are correctly predicted as containing no object. This is the number of true negatives at the image level.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
uint NumCorrectlyPredictedImagesWithoutObjects
  { get; }
```

ELocatorMetrics.NumLabels

Number of labels recognized by the ELocator tool that produced these metrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLabels
  { get; }
```

ELocatorMetrics.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorMetrics operator=(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorMetrics other
 )
```

Parameters

other

Reference to the ELocatorMetrics object used for the assignment

ELocatorMetrics.Precision

Precision (proportion of detected objects that are correct).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Precision
  { get; }
```

ELocatorMetrics.Recall

Recall (true positive rate, proportion of ground truth object that are correctly detected).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Recall
  { get; }
```

ELocatorMetrics.Save

Saves a locator metric. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.147. ELocatorObject Class

Object for a ELocator tool.

Derived Class(es):ELocatorPredictedObject

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Features	Features of this locator object.
Height	Height of the object.
Label	Label of the object.
ObjectSize	Object size for EasyLocate Interest points. This property is set by a EClassificationDataset or EInterestPointLocator instance.
OrgX	Top-left corner X origin of the object.
OrgY	Top-left corner y origin of the object.
PositionX	X position of an object. When the object has a size, the position if the center of the bounding box.
PositionY	Y position of an object without size. When the object has a size, the position if the center of the bounding box.
RectangleRegion	Rectangle region for the object. The region must be axis-aligned. When the object has not the ELocatorFeature_Size feature, the width and height of the rectangle are equal to ELocatorObject property.

Width	Width of the object.

Methods

Draw	Draws the object with its label.
ELocatorObject	Constructs a ELocatorObject.
HasFeature	Checks that the object has a locator feature.
IsValid	Whether the locator object is valid.
operator!=	Inequality operator.
operator=	Assignment operator
operator==	Equality operator.
SetOriginAndSize	Sets the position and size of an object using its top left origin, width, and height.

ELocatorObject.Draw

Draws the object with its label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 bool drawLabel,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 IntPtr graphicsContext,
 bool drawLabel,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

-

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawLabel

Whether to draw the label of the object or not

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELocatorObject.ELocatorObject

Constructs a ELocatorObject.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ELocatorObject(
 )

void ELocatorObject(
 float posX,
 float posY,
 string label
 )
```

```
void ELocatorObject(
 float orgX,
 float orgY,
 float width,
 float height,
 string label
 )
void ELocatorObject(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorObject other
 )
```

Parameters

posX
X position of the object

posY
Y position of the object

label
Label of the object

orgX
X origin of the object

orgY
Y origin of the object

width
Width of the object

height
Height of the object

other
Reference to the ELocatorObject object that should be copied

ELocatorObject.Features

Features of this locator object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int Features
  { get; }
```

ELocatorObject.HasFeature

Checks that the object has a locator feature.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool HasFeature(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorFeature feature
 )
```

Parameters

feature

Feature to check.

ELocatorObject.Height

Height of the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Height
  { get; set; }
```

ELocatorObject.IsValid

Whether the locator object is valid.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

ELocatorObject.Label

Label of the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Label
  { get; set; }
```

ELocatorObject.ObjectSize

Object size for EasyLocate Interest points. This property is set by a EClassificationDataset or EInterestPointLocator instance.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int ObjectSize
  { get; }
```

ELocatorObject.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorObject other
 )
```

Parameters

other

Other object to compare to.

ELocatorObject.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ELocatorObject operator=(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorObject other
 )
```

Parameters

other

Reference to the ELocatorObject object used for the assignment

ELocatorObject.operator==

Equality operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool operator==(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorObject other
 )
```

Parameters

other

Other object to compare to.

ELocatorObject.OrgX

Top-left corner X origin of the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float OrgX
  { get; set; }
```

ELocatorObject.OrgY

Top-left corner y origin of the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float OrgY
  { get; set; }
```

ELocatorObject.PositionX

X position of an object. When the object has a size, the position if the center of the bounding box.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float PositionX
  { get; set; }
```

ELocatorObject.PositionY

Y position of an object without size. When the object has a size, the position if the center of the bounding box.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float PositionY
  { get; set; }
```

ELocatorObject.RectangleRegion

Rectangle region for the object. The region must be axis-aligned.
When the object has not the ELocatorFeature_Size feature, the width and height of the rectangle are equal to ELocatorObject property.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.ERectangleRegion RectangleRegion
  { get; set; }
```

ELocatorObject.SetOriginAndSize

Sets the position and size of an object using its top left origin, width, and height.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SetOriginAndSize(
 float orgX,
 float orgY,
 float width,
 float height
 )
```

Parameters

orgX
X origin of the object
orgY
Y origin of the object
width
Width of the object
height
Height of the object

ELocatorObject.Width

Width of the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Width
  { get; set; }
```

4.148. ELocatorPredictedObject Class

Object predicted by a ELocator tool.

Base Class:ELocatorObject
Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Probability	Probability of the object.

Methods

Draw	Draws the object with its label and probability.
ELocatorPredictedObject	Copy constructor.
operator=	Assignment operator.

ELocatorPredictedObject.Draw

Draws the object with its label and probability.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 bool drawLabel,
 bool drawProbability,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicsContext,
 bool drawLabel,
 bool drawProbability,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

-

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawLabel

Whether to draw the label of the object or not

drawProbability

Whether to draw the probability of the object or not

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELocatorPredictedObject.ELocatorPredictedObject

Copy constructor.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void ELocatorPredictedObject(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorPredictedObject other
 )
```

Parameters

other

Object to copy

ELocatorPredictedObject.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ELocatorPredictedObject operator=(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorPredictedObject other
 )
```

Parameters

other

Object to copy

ELocatorPredictedObject.Probability

Probability of the object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float Probability
  { get; }
```

4.149. ELocatorResult Class

Result of a ELocator tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

DetectedObjects	Detected objects.
DetectionThreshold	Detection threshold set by the ELocator tool.
GroundtruthObjects	Groundtruth objects if ELocatorResult::HasGroundtruth is equal to true.
LocatorFeatures	Locator features of the result.
NumLabels	Number of labels the ELocator can recognize.
ObjectSize	Object size for prediction made by a EInterestPointLocator.

Methods

Draw	Draws the detected objects with their label and score.
ELocatorResult	Constructs an ELocatorResult object.
GetLabel	i-th label recognized by the ELocator.
GetLabelColor	Color of a label.
GetNumDetectedObjects	Number of detected objects in the image.
HasGroundtruth	Whether the result has a groundtruth.
IsValid	Whether the result is valid and was produced by a ELocator objet.
Load	Loads a locator result. The given ESerializer must have been created for reading.
operator=	Assignement operator.
RemoveGroundtruth	Removes the groundtruth.
Save	Saves a locator result. The given ESerializer must have been created for writing.

ELocatorResult.DetectedObjects

Detected objects.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorPredictedObject[] DetectedObjects
  { get; }
```

ELocatorResult.DetectionThreshold

Detection threshold set by the ELocator tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float DetectionThreshold
  { get; }
```

ELocatorResult.Draw

Draws the detected objects with their label and score.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 bool drawLabel,
 bool drawProbability,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicsContext,
 bool drawLabel,
 bool drawProbability,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

-

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning factor, in pixels. By default, no panning occurs.

panY

Vertical panning factor, in pixels. By default, no panning occurs.

drawLabel

Whether to draw the label of each detected object or not

drawProbability

Whether to draw the probability of each detected object or not

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ELocatorResult.ELocatorResult

Constructs an ELocatorResult object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ELocatorResult(
 )
void ELocatorResult(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorResult other
 )
```

Parameters

other

ELocatorResult object

ELocatorResult.GetLabel

i-th label recognized by the ELocator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetLabel(
 int i
 )
```

Parameters

i

Label index between 0 and ELocatorResult::NumLabels

ELocatorResult.GetLabelColor

Color of a label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.ERGBColor GetLabelColor(
 int i
 )
Euresys.Open_eVision.ERGBColor GetLabelColor(
 string label
 )
```

Parameters

i

Index of the label for which to get the color (between 0 and ELocatorResult::NumLabels - 1)

label

Label for which to get the color

Remarks

The label color is controlled at the tool level. To change a color in a result, change the label color in the tool.

ELocatorResult.GetNumDetectedObjects

Number of detected objects in the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int GetNumDetectedObjects(
 )
int GetNumDetectedObjects(
 string label
 )
int GetNumDetectedObjects(
 int labelId
 )
```

Parameters

label

Label for which to count the detected objects

labelId

Index of label for which to count the detected objects

ELocatorResult.GroundtruthObjects

Groundtruth objects if ELocatorResult::HasGroundtruth is equal to true.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorObject[] GroundtruthObjects
  { get; }
```

ELocatorResult.HasGroundtruth

Whether the result has a groundtruth.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasGroundtruth(
 )
```

ELocatorResult.IsValid

Whether the result is valid and was produced by a ELocator objet.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsValid(
 )
```

ELocatorResult.Load

Loads a locator result. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

ELocatorResult.LocatorFeatures

Locator features of the result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int LocatorFeatures
```

```
{ get; }
```

ELocatorResult.NumLabels

Number of labels the ELocator can recognize.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLabels
  { get; }
```

ELocatorResult.ObjectSize

Object size for prediction made by a EInterestPointLocator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int ObjectSize
  { get; }
```

ELocatorResult.operator=

Assignement operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ELocatorResult operator=(
 Euresys.Open_eVision.EasyDeepLearning.ELocatorResult other
 )
```

Parameters

other

ELocatorResult object.

ELocatorResult.RemoveGroundtruth

Removes the groundtruth.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveGroundtruth(
 )
```

ELocatorResult.Save

Saves a locator result. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.150. EMailBarcode Class

Manages a complete context for a Mail Barcode.

Namespace: Euresys.Open_eVision

Properties

ChecksumOk	Returns if the checksum was successfully validated.
ComponentStrings	Returns the list of semantic parts included in the mail barcode text.
Orientation	Returns the orientation of the mail barcode.
Position	Returns the position of the mail barcode in the Image/ROI.
Symbology	Returns the symbology of the mail barcode.
Text	Returns the full decoded text of the mail barcode.

Methods

Draw	Draws the bounding box of the mail barcode.

EMailBarcode	Constructs an EMailBarcodeReader context.
operator=	Assignment operator

EMailBarcode.ChecksumOk

Returns if the checksum was successfully validated.

Namespace: Euresys.Open_eVision

[C#]

```
bool ChecksumOk
  { get; }
```

EMailBarcode.ComponentStrings

Returns the list of semantic parts included in the mail barcode text.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EStringPair[] ComponentStrings
  { get; }
```

EMailBarcode.Draw

Draws the bounding box of the mail barcode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter adapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

adapter

-

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

hDC

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMailBarcode.EMailBarcode

Constructs an EMailBarcodeReader context.

Namespace: Euresys.Open_eVision

```
[C#]
void EMailBarcode(
 Euresys.Open_eVision.EMailBarcode other
 )
```

Parameters

other

-

EMailBarcode.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMailBarcode operator=(
 Euresys.Open_eVision.EMailBarcode other
 )
```

Parameters

other

-

EMailBarcode.Orientation

Returns the orientation of the mail barcode.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMailBarcodeOrientation Orientation
  { get; }
```

EMailBarcode.Position

Returns the position of the mail barcode in the Image/ROI.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERectangle Position
  { get; }
```

EMailBarcode.Symbology

Returns the symbology of the mail barcode.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMailBarcodeSymbologies Symbology
  { get; }
```

EMailBarcode.Text

Returns the full decoded text of the mail barcode.

Namespace: Euresys.Open_eVision

```
[C#]
string Text
  { get; }
```

4.151. EMailBarcodeReader Class

Manages a complete context for a Mail Barcode Reader.

Namespace: Euresys.Open_eVision

Properties

EnableClutteredBarcodes	Enables cluttered barcode (barcode with fused bars) support.
EnableDottedBarcodes	Enables dotted barcode support.
ExpectedOrientations	Expected barcode orientations for the Mail Barcode detection.
ExpectedSymbologies	Expected symbologies for the Mail Barcode detection.
ValidateChecksum	Configures the reader to return barcodes even if their checksum is incorrect.

Methods

EMailBarcodeReader	Constructs an EMailBarcodeReader context.
Load	Loads the settings of the EMailBarcodeReader object, from disk.
operator=	Assignment operator
Read	Locates and decodes mail barcodes.
Save	Saves the current settings of the EMailBarcodeReader object.

EMailBarcodeReader.EMailBarcodeReader

Constructs an EMailBarcodeReader context.

Namespace: Euresys.Open_eVision

```
[C#]
void EMailBarcodeReader(
 )
void EMailBarcodeReader(
 Euresys.Open_eVision.EMailBarcodeReader other
 )
```

Parameters

other

-

EMailBarcodeReader.EnableClutteredBarcodes

Enables cluttered barcode (barcode with fused bars) support.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableClutteredBarcodes
  { get; set; }
```

EMailBarcodeReader.EnableDottedBarcodes

Enables dotted barcode support.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableDottedBarcodes
  { get; set; }
```

EMailBarcodeReader.ExpectedOrientations

Expected barcode orientations for the Mail Barcode detection.

Namespace: Euresys.Open_eVision

[C#]

```
int ExpectedOrientations
  { get; set; }
```

Remarks

The value is a combination of the members of the EMailBarcodeOrientation enumerate.

EMailBarcodeReader.ExpectedSymbologies

Expected symbologies for the Mail Barcode detection.

Namespace: Euresys.Open_eVision

[C#]

```
int ExpectedSymbologies
  { get; set; }
```

Remarks

The value is a combination of the members of the EMailBarcodeSymbologies enumerate.

EMailBarcodeReader.Load

Loads the settings of the EMailBarcodeReader object, from disk.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
void Load(
 string path
 )
```

Parameters

serializer

The serializer.

path

A string containing the full path to the file.

EMailBarcodeReader.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMailBarcodeReader operator=(
 Euresys.Open_eVision.EMailBarcodeReader other
 )
```

Parameters

other

-

EMailBarcodeReader.Read

Locates and decodes mail barcodes.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EMailBarcode[] Read(
 Euresys.Open_eVision.EROIBW8 roi
 )
```

Parameters

roi

The ROI/Image in which to search for mail barcodes.

Remarks

This method returns the list of the detected barcodes.

EMailBarcodeReader.Save

Saves the current settings of the EMailBarcodeReader object.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )

void Save(
 string path
 )
```

Parameters

serializer

The serializer.

path

A string containing the full path to the file.

Remarks

It is advised to use a file extension that is non-standard (for instance *.mbr).

EMailBarcodeReader.ValidateChecksum

Configures the reader to return barcodes even if their checksum is incorrect.

Namespace: Euresys.Open_eVision

[C#]

```
bool ValidateChecksum
  { get; set; }
```

4.152. EMatcher Class

Manages a complete matching context in EasyMatch.

Remarks

A matching context consists of a learned pattern and of the parameters required to locate one or more instances of the pattern in a search field.

Namespace: Euresys.Open_eVision

Properties

AdvancedLearning	Toggle advanced learning.
ContrastMode	Contrast mode.
CorrelationMode	Correlation mode.
DontCareThreshold	"Don't care" threshold.
EnableEarlyCandidateRejection	Whether to remove bad candidates in the early phases of the processing or not. Enabled by default.
FilteringMode	Filtering mode.
FinalReduction	Index of the last reduction.
InitialMinScore	Minimum score applied as a selection criterion in the early stages of the matching process.
Interpolate	Interpolation mode.
IsotropicScale	Flag indicating whether isotropic (as opposed to anisotropic) scaling is used.
MaxAngle	Maximum angle, in the current angle unit.
MaxInitialPositions	Maximum number of positions at the first stage of the matching process.
MaxOverlap	Overlapping tolerance
MaxPositions	Maximum number of positions.
MaxScale	Maximum scale factor for isotropic scaling.
MaxScaleX	Maximum horizontal scale factor for anisotropic scaling.
MaxScaleY	Maximum vertical scale factor for anisotropic scaling.
MinAngle	Minimum angle, in the current angle unit.
MinReducedArea	Minimum reduced area parameter.
MinScale	Minimum scale factor for isotropic scaling.
MinScaleX	Minimum horizontal scale factor for anisotropic scaling.
MinScaleY	Minimum vertical scale factor for anisotropic scaling.
MinScore	Minimum score.

NumPositions	Number of good matches found, as defined by EMatcher::MinScore and EMatcher::MaxPositions properties.
NumReductions	Number of reduction steps used in the matching process.
PatternHeight	Learned pattern height.
PatternLearnt	Returns true after a learning operation has been successfully performed, indicating that the EMatcher object is ready for matching, and false otherwise.
PatternType	Pixel type of the learned pattern.
PatternWidth	Learned pattern width.
Positions	Returns a vector of EMatchPosition objects, each containing the position coordinates and other matching results.
Version	Version number of the EMatcher object.

Methods

ClearImage	Releases the pointer to the image object that has been passed to the EMatcher object.
CopyLearntPattern	Copies the learned pattern in the supplied image. If no pattern has been learned, an exception with code NoPatternLearnt will be thrown.
CopyTo	Copies all the data of the current EMatcher object into another EMatcher object and returns it.
DrawPosition	Draws a graphical representation of a given occurrence of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.
DrawPositions	Draws a graphical representation of all occurrences of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.
DrawPositionsWithCurrentPen	Draws a graphical representation of all occurrences of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.
DrawPositionWithCurrentPen	Draws a graphical representation of a given occurrence of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.
EMatcher	Constructs a matching context.
GetAngleStep	Gets the angle step used at the given reduction.
GetExtension	Gets the extension of the matching ROI, i.e. the horizontal and vertical distances, in pixels, that the found pattern occurrences may fall outside the matching ROI. Such occurrences partially outside the ROI have their score corrected by the ratio between the pattern area outside the ROI and the pattern area inside.
GetPixelDimensions	Gets the physical pixel dimensions.
GetPosition	Returns an EMatchPosition object containing the position coordinates.
GetScaleStep	Gets the scale step used at the given reduction.

GetScaleXStep	Gets the scale step used on the X axis at the given reduction.
GetScaleYStep	Gets the scale step used on the Y axis at the given reduction.
LearnPattern	Learns a pattern to subsequently match in an image.
Load	Loads the EMatcher. The given ESerializer must have been created for reading.
Match	Matches the pattern against an image.
operator=	Copies all the data from another EMatcher object into the current EMatcher object
Save	Saves the EMatcher. The given ESerializer must have been created for writing.
SetExtension	Sets the extension of the matching ROI, i.e. puts the horizontal and vertical distances, in pixels, that the found pattern occurrences may fall outside the matching ROI. Such occurrences partially outside the ROI have their score corrected by the ratio between the pattern area outside the ROI and the pattern area inside.
SetPixelDimensions	Sets the physical pixel dimensions.

EMatcher.AdvancedLearning

Toggle advanced learning.

Namespace: Euresys.Open_eVision

```
[C#]
bool AdvancedLearning
  { get; set; }
```

Remarks

When enabled, the advanced learning process will try to optimize learning parameters like the Minimum Reduced Area. Advanced learning uses the whole image context (parent EImage for an EROI) to optimize the parameters. The learning will take more time (from 1x to 5x longer) but the matching probability could be improved. The improvement strongly depends on the pattern source image. The advanced learning is automatically disabled when the method EMatcher::MinReducedArea is called.
In addition, advanced learning does not work when using EMatcher::DontCareThreshold and a masked image. However, it is compatible with the overload of EMatcher::LearnPattern taking an ERegion, which allows to do the same as EMatcher::DontCareThreshold.

EMatcher.ClearImage

Releases the pointer to the image object that has been passed to the EMatcher object.

Namespace: Euresys.Open_eVision

[C#]

```
void ClearImage(
 )
```

Remarks

It is the way to tell to the EMatcher object that its pointer is not valid anymore. The EMatcher::Match method keeps a copy of the image pointer given as parameter. So, if the user deletes this pointer, the EMatcher object should be informed.

EMatcher.ContrastMode

Contrast mode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EMatchContrastMode ContrastMode
  { get; set; }
```

Remarks

By default, the contrast mode is set to Normal.

EMatcher.CopyLearntPattern

Copies the learned pattern in the supplied image. If no pattern has been learned, an exception with code NoPatternLearnt will be thrown.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyLearntPattern(
 Euresys.Open_eVision.EImageBW8 image
 )
void CopyLearntPattern(
 Euresys.Open_eVision.EImageC24 image
 )
```

Parameters

image

Pointer to the image in which the learned pattern will be returned.

EMatcher.CopyTo

Copies all the data of the current EMatcher object into another EMatcher object and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EMatcher other
 )
```

Parameters

other

Reference to the EMatcher object in which the current EMatcher object parameters are to be copied.

EMatcher.CorrelationMode

Correlation mode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECorrelationMode CorrelationMode
  { get; set; }
```

Remarks

This property tells what normalization rule is used to correlate the pattern to the image. By default, the correlation mode is set to Normalized.

EMatcher.DontCareThreshold

"Don't care" threshold.

Namespace: Euresys.Open_eVision

[C#]

```
uint DontCareThreshold
  { get; set; }
```

Remarks

If the pattern cannot be inscribed in a rectangle because there are foreign objects in a close neighborhood, mismatches can be avoided by using "don't care" pixels: all the pattern pixels whose value is strictly below DontCareThreshold will be ignored. By default, this property is set to 0: no "don't care" pixel exists.

Note. When you use the "don't care" feature, either the pattern is well contrasted from its background -then set DontCareThreshold to an appropriate thresholding value- or it is not -then set the background pixels of the pattern to some low value (by a masking operation) and set DontCareThreshold to this low value plus one.

In addition, EMatcher::AdvancedLearning does not work when using a don't care threshold and a masked image. However, it is compatible with the overload of EMatcher::LearnPattern taking an ERegion, which allows to do the same as EMatcher::DontCareThreshold.

EMatcher.DrawPosition

Draws a graphical representation of a given occurrence of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawPosition(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint index,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawPosition(
 IntPtr graphicContext,
 uint index,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawPosition(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint index,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

index

Occurrence index, in range 0..NumPositions-1.

bCorner

true if the corner mark is to be drawn. false by default. (This mark is useful when large rotations are allowed.)

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatcher.DrawPositions

Draws a graphical representation of all occurrences of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawPositions(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawPositions(
 IntPtr graphicContext,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawPositions(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

bCorner

true if the corner mark is to be drawn. false by default. (This mark is useful when large rotations are allowed.)

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all occurrences (to vary the colors, draw the objects separately using the EMatcher::DrawPosition method instead). Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatcher.DrawPositionsWithCurrentPen

This method is deprecated.

Draws a graphical representation of all occurrences of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawPositionsWithCurrentPen(
 IntPtr graphicContext,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

bCorner

true if the corner mark is to be drawn. false by default. (This mark is useful when large rotations are allowed.)

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all occurrences (to vary the colors, draw the objects separately using the EMatcher::DrawPosition method instead). Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatcher.DrawPositionWithCurrentPen

This method is deprecated.

Draws a graphical representation of a given occurrence of the pattern in the image, using a rectangle and possibly a small line segment in the upper-left corner.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawPositionWithCurrentPen(
 IntPtr graphicContext,
 uint index,
 bool bCorner,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

index

Occurrence index, in range 0..NumPositions-1.

bCorner

true if the corner mark is to be drawn. false by default. (This mark is useful when large rotations are allowed.)

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatcher.EMatcher

Constructs a matching context.

Namespace: Euresys.Open_eVision

[C#]

```
void EMatcher(
 )

void EMatcher(
 uint maxNumDOF
 )
```

```
void EMatcher(
 Euresys.Open_eVision.EMatcher other
 )
```

Parameters

maxNumDOF

Maximum number of degrees of freedom (this number must be comprised between 2 and 5).

other

Another EMatcher object to be copied in the new EMatcher object.

Remarks

With the default constructor (no argument), all parameters are initialized to their respective default values. The copy constructor constructs a matching context based on a pre-existing EMatcher object. The last constructor constructs a matching context with a specified number of degrees of freedom. maximumNumberOfDegreesOfFreedom is the maximum number of degrees of freedom that the EMatcher object being constructed will be allowed to use during its life. All other parameters are initialized to their respective default values. The degrees of freedom for a matching operation are the *translation* (2 modes), the *rotation* (1 mode), the *isotropic scaling* (1 mode) and the *anisotropic scaling* (1 more mode). There is no way to modify this parameter for an existing EMatcher object. The default value for maximumNumberOfDegreesOfFreedom is 5, that is the maximum value. The minimum value for the number of degrees of freedom is 2, in order to allow, at least, the pattern translation.

EMatcher.EnableEarlyCandidateRejection

Whether to remove bad candidates in the early phases of the processing or not. Enabled by default.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableEarlyCandidateRejection
  { get; set; }
```

Remarks

To reduce the number of candidates, those failing to fill some criterion are removed. This makes processing faster, a downside is that some good candidates can be erroneously removed. We recommend setting this parameter to false if you observe that a slight change in the input conditions make processing fail. For example: changing the search ROI in the image slightly.
After disabling the early candidate rejection, you will probably have to increase EMatcher::MaxInitialPositions as more candidates will now be kept.

EMatcher.FilteringMode

Filtering mode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFilteringMode FilteringMode
  { get; set; }
```

Remarks

To achieve acceptable time performance, EasyMatch works by sub-sampling the pattern in the early phases of the processing. The filtering mode parameter allows to select the pre-processing type applied to the image before the decimation: averaging or low-pass filtering. By default, this property is set to Uniform, whereas the LowPass mode is indicated if the image presents sharp gray-level transitions.

EMatcher.FinalReduction

Index of the last reduction.

Namespace: Euresys.Open_eVision

[C#]

```
uint FinalReduction
  { get; set; }
```

Remarks

The pattern matching process is comprised of a few passes (typically 4) during which the position accuracy is improved by a factor of 2 (for all degrees of freedom). This is called a *reduction*. By default, the computation continues until an accuracy of one pixel is obtained. To speed up the process, the last reduction passes can be dropped, so lowering the accuracy. Anyway, the interpolation mode can then still be used. By default, this property is set to 0 (pixel accuracy). Value 1 corresponds to 2-pixels accuracy, 2 to 4, and so on. The range of values that can be used for this property is 0 to NumReductions-1.

EMatcher.GetAngleStep

Gets the angle step used at the given reduction.

Namespace: Euresys.Open_eVision

[C#]

```
float GetAngleStep(
 uint reduction
 )
```

Parameters

reduction

Offset of the reduction in the pyramid, must be between EMatcher::FinalReduction and EMatcher::NumReductions - 1.

EMatcher.GetExtension

Gets the extension of the matching ROI, i.e. the horizontal and vertical distances, in pixels, that the found pattern occurrences may fall outside the matching ROI. Such occurrences partially outside the ROI have their score corrected by the ratio between the pattern area outside the ROI and the pattern area inside.

Namespace: Euresys.Open_eVision

```
[C#]
void GetExtension(
 out int n32ExtensionX,
 out int n32ExtensionY
 )
```

Parameters

n32ExtensionX

extension outside the matching ROI along its Width, in pixels.

n32ExtensionY

extension outside the matching ROI along its Height, in pixels.

EMatcher.GetPixelDimensions

Gets the physical pixel dimensions.

Namespace: Euresys.Open_eVision

```
[C#]
void GetPixelDimensions(
 out float width,
 out float height
 )
```

Parameters

width

Width of a pixel.

height

Height of a pixel.

EMatcher.GetPosition

Returns an EMatchPosition object containing the position coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatchPosition GetPosition(
 uint index
 )
```

Parameters

index

0-based index to the desired position. The positions are ordered by decreasing score.

EMatcher.GetScaleStep

Gets the scale step used at the given reduction.

Namespace: Euresys.Open_eVision

```
[C#]
float GetScaleStep(
 uint reduction
 )
```

Parameters

reduction

Offset of the reduction in the pyramid, must be between EMatcher::FinalReduction and EMatcher::NumReductions - 1.

EMatcher.GetScaleXStep

Gets the scale step used on the X axis at the given reduction.

Namespace: Euresys.Open_eVision

```
[C#]
float GetScaleXStep(
 uint reduction
 )
```

Parameters

reduction

Offset of the reduction in the pyramid, must be between EMatcher::FinalReduction and EMatcher::NumReductions - 1.

EMatcher.GetScaleYStep

Gets the scale step used on the Y axis at the given reduction.

Namespace: Euresys.Open_eVision

[C#]

```
float GetScaleYStep(
 uint reduction
 )
```

Parameters

reduction

Offset of the reduction in the pyramid, must be between EMatcher::FinalReduction and EMatcher::NumReductions - 1.

EMatcher.InitialMinScore

Minimum score applied as a selection criterion in the early stages of the matching process.

Namespace: Euresys.Open_eVision

[C#]

```
float InitialMinScore
  { get; set; }
```

Remarks

When the search for matches starts, EasyMatch considers a set of candidate positions that it progressively refines. When they later appear to be bad candidates, they are rejected. Though it is the minimum score level that is used to reject bad matching positions at the final step of the matching process, the "initial minimum score" parameter is used to eliminate bad positions (whose score is not high enough) in the early stages of the matching processing. If the matching process is achieved in one step, only the minimum score parameter will be considered. By default, this property is set to -1.

EMatcher.Interpolate

Interpolation mode.

Namespace: Euresys.Open_eVision

[C#]

```
bool Interpolate
  { get; set; }
```

Remarks

By default, matching is done with a one-pixel precision for all degrees of freedom (translation, rotation and scaling). You can use an additional interpolation process to achieve sub-pixel accuracy. This generally leads to an improvement of the sub-pixel accuracy by a factor larger than 10. This is possible only when the found instances match closely the model. A score higher than 0.99 indicates that the instances are a close match of the model. In other words, the instance is considered to be more accurate when the score is higher. The added computational cost is low. By default, this property is set to false.

EMatcher.IsotropicScale

Flag indicating whether isotropic (as opposed to anisotropic) scaling is used.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsotropicScale
  { get; }
```

Remarks

true if isotropic (as opposed to anisotropic) scaling is used, i.e. when the scale factors in both the X and Y directions are equal.

EMatcher.LearnPattern

Learns a pattern to subsequently match in an image.

Namespace: Euresys.Open_eVision

[C#]

```
void LearnPattern(
 Euresys.Open_eVision.EROIBW8 pattern
 )

void LearnPattern(
 Euresys.Open_eVision.EROIC24 pattern
 )

void LearnPattern(
 Euresys.Open_eVision.EROIBW8 pattern,
 Euresys.Open_eVision.ERegion region
 )

void LearnPattern(
 Euresys.Open_eVision.EROIC24 pattern,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

pattern

Pattern to learn.

region

Region in the pattern image to consider

Remarks

The maximum size for a pattern is (sqrt(Minimum Reduced Area) - 1) * 2^8. For the default Minimum Reduced Area of 64, this corresponds to a 1792x1792 maximum size. Increasing the Minimum Reduced Area enables larger pattern size but reduces the processing speed.
When a region is given, the method will ignore the pixels outside the region by internally setting them to 0 and setting EMatcher::DontCareThreshold to 1 if it wasn't set by the user. Thus, when working with an ERegion, all pixels that are black in the pattern will be discarded.

EMatcher.Load

Loads the EMatcher. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EMatcher.Match

Matches the pattern against an image.

Namespace: Euresys.Open_eVision

[C#]

```
void Match(
 Euresys.Open_eVision.EROIBW8 image
 )
```

```
void Match(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.ERegion region
 )
void Match(
 Euresys.Open_eVision.EROIC24 image
 )
void Match(
 Euresys.Open_eVision.EROIC24 image,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

image

Pointer to the image/ROI within which the pattern will be searched for.

region

Region within which the pattern will be searched for.

Remarks

The matching results can be obtained by means of the EMatcher::NumPositions and EMatcher::GetPosition members.

EMatcher.MaxAngle

Maximum angle, in the current angle unit.

Namespace: Euresys.Open_eVision

[C#]

```
float MaxAngle
  { get; set; }
```

Remarks

The rotation of the pattern is allowed within the range (-1 <= MinAngle < MaxAngle <= 1 revolution). By default, both remain 0.

EMatcher.MaxInitialPositions

Maximum number of positions at the first stage of the matching process.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxInitialPositions
  { get; set; }
```

Remarks

When the search for matches starts, EasyMatch considers a set of candidate positions that it progressively refines. When they later appear to be bad candidates, they are rejected. Eventually, a maximum of EMatcher::MaxPositions is returned. In some circumstances, when the image contains features roughly similar to the pattern, these can confuse the matching process, resulting in false matches. To overcome this situation, increasing the number of initial positions will help. By default, this property is set to 0, indicating that the value of EMatcher::MaxPositions should be used instead.

EMatcher.MaxOverlap

Overlapping tolerance

Namespace: Euresys.Open_eVision

[C#]

```
float MaxOverlap
  { get; set; }
```

Remarks

0.0 means all found patterns must be disconnected, 1.0 means they can fully overlap. Default: 1.0.

EMatcher.MaxPositions

Maximum number of positions.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxPositions
  { get; set; }
```

Remarks

Indicates how many matching positions have to be returned at a maximum. This number corresponds to the expected maximum number of occurrences of the pattern (it is sometimes advisable to use a few additional positions). By default, this property is set to 1.

EMatcher.MaxScale

Maximum scale factor for isotropic scaling.

Namespace: Euresys.Open_eVision

[C#]

```
float MaxScale
```

```
{ get; set; }
```

Remarks

Two scaling modes are allowed: in isotropic mode, the scale factor is identical in all directions; in anisotropic mode, the scale factors differ in the horizontal and vertical directions. To select the appropriate mode, it suffices to call the relevant Set member. The scaling of the pattern is allowed within the range (0.5 <= MinScale < MaxScale <= 2). By default, both remain 1. The same holds for anisotropic scale factors.

EMatcher.MaxScaleX

Maximum horizontal scale factor for anisotropic scaling.

Namespace: Euresys.Open_eVision

[C#]

```
float MaxScaleX
  { get; set; }
```

Remarks

Two scaling modes are allowed: in isotropic mode, the scale factor is identical in all directions; in anisotropic mode, the scale factors differ in the horizontal and vertical directions. To select the appropriate mode, it suffices to call the relevant Set member. The scaling of the pattern is allowed within the range (0.5 <= MinScaleX < MaxScaleX <= 2). By default, both remain 1. The same holds for anisotropic scale factors.

EMatcher.MaxScaleY

Maximum vertical scale factor for anisotropic scaling.

Namespace: Euresys.Open_eVision

[C#]

```
float MaxScaleY
  { get; set; }
```

Remarks

Two scaling modes are allowed: in isotropic mode, the scale factor is identical in all directions; in anisotropic mode, the scale factors differ in the horizontal and vertical directions. To select the appropriate mode, it suffices to call the relevant Set member. The scaling of the pattern is allowed within the range (0.5 <= MinScaleY < MaxScaleY <= 2). By default, both remain 1. The same holds for anisotropic scale factors.

EMatcher.MinAngle

Minimum angle, in the current angle unit.

Namespace: Euresys.Open_eVision

```
[C#]
float MinAngle
  { get; set; }
```

Remarks

The rotation of the pattern is allowed within the range (-1 <= MinAngle < MaxAngle <= 1 revolution). By default, both remain 0.

EMatcher.MinReducedArea

Minimum reduced area parameter.

Namespace: Euresys.Open_eVision

```
[C#]
uint MinReducedArea
  { get; set; }
```

Remarks

To achieve acceptable time performance, EasyMatch works by under-sampling the pattern in the early phases of the processing. This property tells how many pixels of the pattern are kept, at a minimum. By default, this property is set to 64, which is the right choice in most situations. Higher values are not recommended. Lower values can speed up the processing, but sometimes cause the matching process fail to find the best matches. To circumvent this problem, you can use guard positions, that is find more matches than expected and keep the good ones only.

Note. Changing this property invalidates any previous learning.

EMatcher.MinScale

Minimum scale factor for isotropic scaling.

Namespace: Euresys.Open_eVision

```
[C#]
float MinScale
  { get; set; }
```

Remarks

Two scaling modes are allowed: in isotropic mode, the scale factor is identical in all directions; in anisotropic mode, the scale factors differ in the horizontal and vertical directions. To select the appropriate mode, it suffices to call the relevant Set member. The scaling of the pattern is allowed within the range (0.5 <= MinScale < MaxScale <= 2). By default, both remain 1. The same holds for anisotropic scale factors.

EMatcher.MinScaleX

Minimum horizontal scale factor for anisotropic scaling.

Namespace: Euresys.Open_eVision

[C#]

```
float MinScaleX
  { get; set; }
```

Remarks

Two scaling modes are allowed: in isotropic mode, the scale factor is identical in all directions; in anisotropic mode, the scale factors differ in the horizontal and vertical directions. To select the appropriate mode, it suffices to call the relevant Set member. The scaling of the pattern is allowed within the range (0.5 <= MinScaleX < MaxScaleX <= 2). By default, both remain 1. The same holds for anisotropic scale factors.

EMatcher.MinScaleY

Minimum vertical scale factor for anisotropic scaling.

Namespace: Euresys.Open_eVision

[C#]

```
float MinScaleY
  { get; set; }
```

Remarks

Two scaling modes are allowed: in isotropic mode, the scale factor is identical in all directions; in anisotropic mode, the scale factors differ in the horizontal and vertical directions. To select the appropriate mode, it suffices to call the relevant Set member. The scaling of the pattern is allowed within the range (0.5 <= MinScaleY < MaxScaleY <= 2). By default, both remain 1. The same holds for anisotropic scale factors.

EMatcher.MinScore

Minimum score.

Namespace: Euresys.Open_eVision

[C#]

```
float MinScore
  { get; set; }
```

Remarks

This property indicates what score a match must reach to be considered as good, and to be returned in the list of positions; this selection criterion is applied at the final stage of the matching process. One good way to select the appropriate EMatcher::MinScore in a given context is to set it to -1 (any match will be retained), set EMatcher::MaxPositions to more than needed, and examine the returned scores after a matching. By default, this property is set to -1.

EMatcher.NumPositions

Number of good matches found, as defined by EMatcher::MinScore and EMatcher::MaxPositions properties.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumPositions
  { get; }
```

EMatcher.NumReductions

Number of reduction steps used in the matching process.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumReductions
  { get; }
```

Remarks

These depend on the actual pattern size, and on the MinReducedArea property. The FinalReduction property, used to speed up matching when coarse location is sufficient, must be set in range 0..NumReductions-1.

EMatcher.operator=

Copies all the data from another EMatcher object into the current EMatcher object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EMatcher operator=(
 Euresys.Open_eVision.EMatcher other
 )
```

Parameters

other

EMatcher object to be copied

EMatcher.PatternHeight

Learned pattern height.

Namespace: Euresys.Open_eVision

[C#]

```
int PatternHeight
  { get; }
```

EMatcher.PatternLearnt

Returns true after a learning operation has been successfully performed, indicating that the EMatcher object is ready for matching, and false otherwise.

Namespace: Euresys.Open_eVision

[C#]

```
bool PatternLearnt
  { get; }
```

EMatcher.PatternType

Pixel type of the learned pattern.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageType PatternType
  { get; }
```

EMatcher.PatternWidth

Learned pattern width.

Namespace: Euresys.Open_eVision

[C#]

```
int PatternWidth
```

```
{ get; }
```

EMatcher.Positions

Returns a vector of EMatchPosition objects, each containing the position coordinates and other matching results.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatchPosition[] Positions
{ get; }
```

EMatcher.Save

Saves the EMatcher. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EMatcher.SetExtension

Sets the extension of the matching ROI, i.e. puts the horizontal and vertical distances, in pixels, that the found pattern occurrences may fall outside the matching ROI. Such occurrences partially outside the ROI have their score corrected by the ratio between the pattern area outside the ROI and the pattern area inside.

Namespace: Euresys.Open_eVision

```
[C#]
void SetExtension(
 int n32ExtensionX,
 int n32ExtensionY
 )
```

Parameters

n32ExtensionX

extension outside the matching ROI along its Width, in pixels.

n32ExtensionY

extension outside the matching ROI along its Height, in pixels.

EMatcher.SetPixelDimensions

Sets the physical pixel dimensions.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixelDimensions(
 float width,
 float height
 )
```

Parameters

width

Width of a pixel.

height

Height of a pixel.

Remarks

When an image has been acquired in such a way that the pixels are "non-square" the physical width and height of the area covered by a pixel are unequal, a form of anisotropy results. When rotated, the objects become skewed; rectangles become parallelograms. In such a situation, the pixel aspect ratio must be known to compensate it during matching. The aspect ratio is given by specifying the true width and height of a pixel. The specification of the pixel dimensions is only useful when rotation is used. Only the aspect ratio matters, so that relative width and height values can be given. By default, the pixel width and height are set to 1.0.

EMatcher.Version

Version number of the EMatcher object.

Namespace: Euresys.Open_eVision

```
[C#]
static uint Version
  { get; }
```

4.153. EMatrixCode Class

This class is deprecated.

Holds all the information regarding a single Data Matrix code: its decoded string, its grading, its errors,...

Namespace: Euresys.Open_eVision

Properties

Angle	MatrixCode angle.
AxialNonUniformity	Measured axial non-uniformity value (1.0 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
AxialNonUniformityGrade	Measured axial non-uniformity grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
CellDefects	Measured cell defects value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
Center	EMatrixCode center.
Contrast	Measured symbol contrast value, as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
ContrastGrade	Measured symbol contrast grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
ContrastType	Symbol contrast type, as defined by EMatrixCodeContrastMode.
DataMatrixCellHeight	Measured data matrix cell height value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
DataMatrixCellWidth	Measured data matrix cell width value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
DecodedString	Decoded Data Matrix symbol string.
Family	ECC symbol family, as defined by EFamily.
FinderPatternDefects	Measured finder pattern defects value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Flipping	Symbol flipping type, as defined by EFlipping.
Found	true if a EMatrixCode object has been found in the ROI supplied to EMatrixCodeReader::Read, even if it could not be successfully decoded.
HorizontalMarkGrowth	Measured horizontal mark growth value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
HorizontalMarkMisplacement	Measured horizontal mark misplacement value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
Iso15415GradingParameters	ISO/IEC 15415 grading parameters
Iso29158GradingParameters	ISO/IEC 29158 grading parameters
LocationThreshold	Absolute threshold (0 to 255 scale) that was used during location of the symbol.
LogicalSize	Symbol logical size, as defined by ELogicalSize.
LogicalSizeHeight	For a logical size of S1xS2, LogicalSizeHeight is the integer S1.
LogicalSizeWidth	For a logical size of S1xS2, LogicalSizeWidth is the integer S2.
MeasuredPrintGrowth	Raw, un-normalized print quality parameter (1.0 to 0 scale), after a read operation, provided that the print quality assessment has been enabled.
NumErrors	Number of errors that were detected and corrected while decoding the symbol.
OverallGrade	Overall symbol grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
PrintGrowth	Normalized measured print growth value, as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
PrintGrowthGrade	Measured print growth grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
ReadingThreshold	Absolute threshold (0 to 255 scale) that was used during reading of the symbol.
SemiT10GradingParameters	Semi T10-0701 grading parameters
SymbolContrastSNR	Measured symbol contrast signal to noise ratio value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
UnusedErrorCorrection	Measured unused error correction value (1.0 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

UnusedErrorCorrectionGrade	Measured unused error correction grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.
VerticalMarkGrowth	Measured vertical mark growth value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.
VerticalMarkMisplacement	Measured vertical mark misplacement value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Methods

Draw	Draws the EMatrixCode corner points and symbol finder pattern (when the symbol size has been correctly detected).
DrawErrors	Draws all symbol finder pattern cells where errors were detected and corrected.
DrawErrorsWithCurrentPen	Draws the detected errors.
DrawWithCurrentPen	Draws the EMatrixCode corner points and symbol finder pattern (when the symbol size has been correctly detected).
EMatrixCode	Constructs a EMatrixCode context.
GetCorner	Gets a matrix code corner.
GetDecodedDataElement	Gets a character value of the matrix code.
IsGS1	true if the decoded string uses the GS1 standard
Load	Saves a EMatrixCode. The given ESerializer must have been created for writing.
operator=	Copies all the data from another EMatrixCode object into the current EMatrixCode object
Save	Loads a EMatrixCode. The given ESerializer must have been created for reading.
SetCorner	Sets a matrix code corner.

EMatrixCode.Angle

This property is deprecated.

MatrixCode angle.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; }
```

Remarks

EMatrixCode.AxialNonUniformity

This property is deprecated.

Measured axial non-uniformity value (1.0 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float AxialNonUniformity
  { get; }
```

EMatrixCode.AxialNonUniformityGrade

This property is deprecated.

Measured axial non-uniformity grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
int AxialNonUniformityGrade
  { get; }
```

EMatrixCode.CellDefects

This property is deprecated.

Measured cell defects value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float CellDefects
  { get; }
```

Remarks

Read-only.

EMatrixCode.Center

This property is deprecated.

EMatrixCode center.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Center
  { get; }
```

EMatrixCode.Contrast

This property is deprecated.

Measured symbol contrast value, as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float Contrast
  { get; }
```

Remarks

This property is computed as the difference of the reference gray levels over their arithmetic average. Values range between 0 and 1.0.

EMatrixCode.ContrastGrade

This property is deprecated.

Measured symbol contrast grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
int ContrastGrade
  { get; }
```

EMatrixCode.ContrastType

This property is deprecated.

Symbol contrast type, as defined by EMatrixCodeContrastMode.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCodeContrastMode ContrastType
  { get; }
```

EMatrixCode.DataMatrixCellHeight

This property is deprecated.

Measured data matrix cell height value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float DataMatrixCellHeight
  { get; }
```

Remarks

Read-only.

EMatrixCode.DataMatrixCellWidth

This property is deprecated.

Measured data matrix cell width value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float DataMatrixCellWidth
  { get; }
```

Remarks

Read-only.

EMatrixCode.DecodedString

This property is deprecated.

Decoded Data Matrix symbol string.

Namespace: Euresys.Open_eVision

[C#]

```
string DecodedString
  { get; }
```

EMatrixCode.Draw

This method is deprecated.

Draws the EMatrixCode corner points and symbol finder pattern (when the symbol size has been correctly detected).

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

The reference corner has a bold cross marking. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawErrors

This method is deprecated.

Draws all symbol finder pattern cells where errors were detected and corrected.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawErrors(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawErrors(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawErrors(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

This member is intended to be called in conjunction with EMatrixCode::Draw. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawErrorsWithCurrentPen

This method is deprecated.

Draws the detected errors.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawErrorsWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

-

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawWithCurrentPen

This method is deprecated.

Draws the EMatrixCode corner points and symbol finder pattern (when the symbol size has been correctly detected).

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

The reference corner has a bold cross marking. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.EMatrixCode

This method is deprecated.

Constructs a EMatrixCode context.

Namespace: Euresys.Open_eVision

```
[C#]
void EMatrixCode(
 )
```

```
void EMatrixCode(
 Euresys.Open_eVision.EMatrixCode other
 )
```

Parameters

other

Another EMatrixCode object to be copied in the new EMatrixCode object.

Remarks

The default constructor constructs an uninitialized EMatrixCode object. All properties are initialized to their respective default values. The copy constructor constructs a EMatrixCode context based on a pre-existing EMatrixCode object. All properties and internal data are copied.

EMatrixCode.Family

This property is deprecated.

ECC symbol family, as defined by EFamily.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFamily Family
  { get; }
```

EMatrixCode.FinderPatternDefects

This property is deprecated.

Measured finder pattern defects value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float FinderPatternDefects
  { get; }
```

Remarks

Read-only.

EMatrixCode.Flipping

This property is deprecated.

Symbol flipping type, as defined by EFlipping.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFlipping Flipping
  { get; }
```

EMatrixCode.Found

This property is deprecated.

true if a EMatrixCode object has been found in the ROI supplied to EMatrixCodeReader::Read, even if it could not be successfully decoded.

Namespace: Euresys.Open_eVision

```
[C#]
bool Found
  { get; }
```

Remarks

If this property is false, it is still possible that an unlocalized matrix code exists in the image. However, if Found is false, no other property should be read.

EMatrixCode.GetCorner

This method is deprecated.

Gets a matrix code corner.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetCorner(
 int index
 )
```

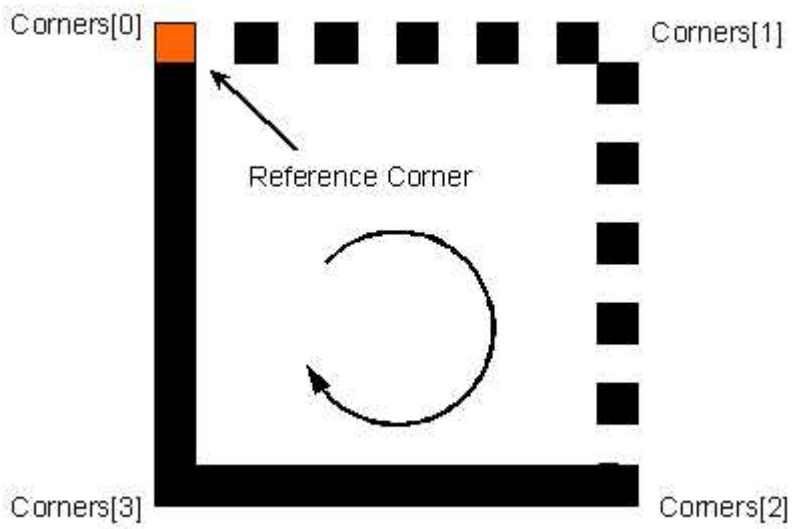
Parameters

index

Index of the matrix code corner.

Remarks

The indices of the corners use the following convention:



EMatrixCode.GetDecodedDataElement

This method is deprecated.

Gets a character value of the matrix code.

Namespace: Euresys.Open_eVision

```
[C#]
byte GetDecodedDataElement(
 int index
 )
```

Parameters

index

Index of the character value.

Remarks

This property makes it possible to see information not coded as ASCII characters.

EMatrixCode.HorizontalMarkGrowth

This property is deprecated.

Measured horizontal mark growth value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float HorizontalMarkGrowth
  { get; }
```

Remarks

Read-only.

EMatrixCode.HorizontalMarkMisplacement

This property is deprecated.

Measured horizontal mark misplacement value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float HorizontalMarkMisplacement
  { get; }
```

Remarks

Read-only.

EMatrixCode.IsGS1

This method is deprecated.

true if the decoded string uses the GS1 standard

Namespace: Euresys.Open_eVision

[C#]

```
bool IsGS1(
 )
```

EMatrixCode.Iso15415GradingParameters

This property is deprecated.

ISO/IEC 15415 grading parameters

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EMatrixCodeIso15415GradingParameters Iso15415GradingParameters
  { get; }
```

Remarks

Read-only.

EMatrixCode.Iso29158GradingParameters

This property is deprecated.

ISO/IEC 29158 grading parameters

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCodeIso29158GradingParameters Iso29158GradingParameters
  { get; }
```

Remarks

Read-only.

EMatrixCode.Load

This method is deprecated.

Saves a EMatrixCode. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
void Load(
 string path
 )
```

Parameters

serializer

The serializer.

path

A string containing the full path to the file.

EMatrixCode.LocationThreshold

This property is deprecated.

Absolute threshold (0 to 255 scale) that was used during location of the symbol.

Namespace: Euresys.Open_eVision

[C#]

```
int LocationThreshold
  { get; }
```

EMatrixCode.LogicalSize

This property is deprecated.

Symbol logical size, as defined by ELogicalSize.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ELogicalSize LogicalSize
  { get; }
```

EMatrixCode.LogicalSizeHeight

This property is deprecated.

For a logical size of S1xS2, LogicalSizeHeight is the integer S1.

Namespace: Euresys.Open_eVision

[C#]

```
int LogicalSizeHeight
  { get; }
```

EMatrixCode.LogicalSizeWidth

This property is deprecated.

For a logical size of S1xS2, LogicalSizeWidth is the integer S2.

Namespace: Euresys.Open_eVision

[C#]

```
int LogicalSizeWidth
  { get; }
```

EMatrixCode.MeasuredPrintGrowth

This property is deprecated.

Raw, un-normalized print quality parameter (1.0 to 0 scale), after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float MeasuredPrintGrowth
  { get; }
```

Remarks

This property is computed as the measured area of the active cells (same color as the finder pattern) over the area of ideal square cells, having sides equal to the pitches (such cells perfectly tile the symbol). Its value typically is on the order of 1.0, regardless the symbol size.

EMatrixCode.NumErrors

This property is deprecated.

Number of errors that were detected and corrected while decoding the symbol.

Namespace: Euresys.Open_eVision

[C#]

```
int NumErrors
  { get; }
```

Remarks

Such errors may be due to symbol degradation by scratches, blur, non-uniform illumination or slight changes in size.

EMatrixCode.operator=

This method is deprecated.

Copies all the data from another EMatrixCode object into the current EMatrixCode object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EMatrixCode operator=(
 Euresys.Open_eVision.EMatrixCode other
 )
```

Parameters

other

EMatrixCode object to be copied

EMatrixCode.OverallGrade

This property is deprecated.

Overall symbol grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
int OverallGrade
  { get; }
```

EMatrixCode.PrintGrowth

This property is deprecated.

Normalized measured print growth value, as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
float PrintGrowth
  { get; }
```

Remarks

The use of this property is a bit tricky: first a raw measure of the print growth is provided as EMatrixCode::MeasuredPrintGrowth. Then, the measurement is normalized from the EMatrixCodeReader::MinimumPrintGrowth /EMatrixCodeReader::MaximumPrintGrowth/EMatrixCodeReader::NominalPrintGrowth properties of the EMatrixCodeReader instance, which must be provided by the user. The normalized EMatrixCode::PrintGrowth ranges around 0.

EMatrixCode.PrintGrowthGrade

This property is deprecated.

Measured print growth grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

[C#]

```
int PrintGrowthGrade
  { get; }
```

Remarks

Read-only.

EMatrixCode.ReadingThreshold

This property is deprecated.

Absolute threshold (0 to 255 scale) that was used during reading of the symbol.

Namespace: Euresys.Open_eVision

```
[C#]
int ReadingThreshold
  { get; }
```

Remarks

Read-only.

EMatrixCode.Save

This method is deprecated.

Loads a EMatrixCode. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
void Save(
 string path
 )
```

Parameters

serializer

The ESerializer object that is read from.

path

A string containing the full path to the file.

EMatrixCode.SemiT10GradingParameters

This property is deprecated.

Semi T10-0701 grading parameters

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCodeSemiT10GradingParameters SemiT10GradingParameters
  { get; }
```

Remarks

Read-only.

EMatrixCode.SetCorner

This method is deprecated.

Sets a matrix code corner.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCorner(
 int index,
 Euresys.Open_eVision.EPoint corner
 )
```

Parameters

index

Index of the matrix code corner.

corner

New corner.

EMatrixCode.SymbolContrastSNR

This property is deprecated.

Measured symbol contrast signal to noise ratio value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float SymbolContrastSNR
  { get; }
```

Remarks

Read-only.

EMatrixCode.UnusedErrorCorrection

This property is deprecated.

Measured unused error correction value (1.0 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float UnusedErrorCorrection
  { get; }
```

Remarks

The EMatrixCode::UnusedErrorCorrection property takes into account the number of redundant bits used for error correction only; no erasure nor error detection bits are considered.

EMatrixCode.UnusedErrorCorrectionGrade

This property is deprecated.

Measured unused error correction grading (4 to 0 scale), as defined by the AIM standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
int UnusedErrorCorrectionGrade
  { get; }
```

Remarks

Read-only.

EMatrixCode.VerticalMarkGrowth

This property is deprecated.

Measured vertical mark growth value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float VerticalMarkGrowth
  { get; }
```

Remarks

Read-only.

EMatrixCode.VerticalMarkMisplacement

This property is deprecated.

Measured vertical mark misplacement value, as defined by the Semi T10 standard, after a read operation, provided that the print quality assessment has been enabled.

Namespace: Euresys.Open_eVision

```
[C#]
float VerticalMarkMisplacement
  { get; }
```

Remarks

Read-only.

4.154. EMatrixCode Class

Holds all the information regarding a single Data Matrix code: its decoded string, its grading, its errors and more.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

Properties

DecodedString	Decoded Data Matrix symbol string.
DecodedStringStream	-
ECC000Family	Retrieves the ECC000 Family for non-ECC200 Matrix Codes.
Errors	Retrieves the position of the errors detected in the Data Matrix symbol.
IsECC200	Indicates if the Data Matrix is ECC200 or not.
IsGraded	Returns true if the Matrix Code has been graded
IsGS1	Returns true if the decoded string uses the GS1 standard
Iso15415GradingParameters	ISO/IEC 15415 grading parameters
Iso29158GradingParameters	ISO/IEC TR 29158 grading parameters
IsReliable	Returns true if the code has been succesfully decoded and false otherwise.
Position	Position of the Data Matrix
ReliabilityScore	Returns a confidence score on the fact that the code is actually a data matrix.
SemiT10GradingParameters	Semi T10-0701 grading parameters

SymbolHeight	Data Matrix Symbol Height (Number of cells in the vertical direction)
SymbolPolarity	Symbol polarity as defined by ESymbolPolarity.
SymbolWidth	Data Matrix Symbol Width (Number of cells in the horizontal direction)

Methods

DrawErrors	Draws the detected errors.
DrawErrorsWithCurrentPen	Draws the detected errors using the pen currently set in the graphical context.
DrawGrid	Draws the detected Data Matrix grid.
DrawGridWithCurrentPen	Draws the detected Data Matrix grid using the pen currently set in the graphical context.
DrawPosition	Draws the Data Matrix Position. This includes the outer edges of the code as well as the timing patterns.
DrawPositionWithCurrentPen	Draws the Data Matrix Position using the pen currently set in the graphical context. This includes the outer edges of the code as well as the timing patterns.
EMatrixCode	Creates an EMatrixCode object.
GetCellColor	Detected color of a cell.
GetCellCorrectedColor	Corrected color of a cell.
GetCellPosition	Position of a cell of the Data Matrix
operator=	Assignment operator

EMatrixCode.DecodedString

Decoded Data Matrix symbol string.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
string DecodedString
  { get; }
```

EMatrixCode.DecodedStringStream

-

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
int[] DecodedStringStream
```

```
{ get; }
```

EMatrixCode.DrawErrors

Draws the detected errors.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void DrawErrors(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawErrors(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

Handle of the graphics context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawErrorsWithCurrentPen

This method is deprecated.

Draws the detected errors using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void DrawErrorsWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawGrid

Draws the detected Data Matrix grid.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void DrawGrid(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawGrid(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

Handle of the graphics context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawGridWithCurrentPen

This method is deprecated.

Draws the detected Data Matrix grid using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void DrawGridWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawPosition

Draws the Data Matrix Position. This includes the outer edges of the code as well as the timing patterns.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void DrawPosition(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawPosition(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

Handle of the graphics context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.DrawPositionWithCurrentPen

This method is deprecated.

Draws the Data Matrix Position using the pen currently set in the graphical context. This includes the outer edges of the code as well as the timing patterns.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void DrawPositionWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EMatrixCode.ECC000Family

Retrieves the ECC000 Family for non-ECC200 Matrix Codes.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EasyMatrixCode2.ECC000Family ECC000Family
  { get; }
```

EMatrixCode.EMatrixCode

Creates an EMatrixCode object.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void EMatrixCode(
 )
void EMatrixCode(
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode other
 )
```

Parameters

other

The reference EMatrixCode instance to copy this one from.

EMatrixCode.Errors

Retrieves the position of the errors detected in the Data Matrix symbol.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EMatrixPosition[] Errors
  { get; }
```

EMatrixCode.GetCellColor

Detected color of a cell.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.ECellColor GetCellColor(
 int x,
 int y
 )
Euresys.Open_eVision.ECellColor GetCellColor(
 Euresys.Open_eVision.EMatrixPosition position
 )
```

Parameters

x

The horizontal index of the cell.

y

The vertical index of the cell.

position

The position of the cell in the code.

Remarks

Returns an ECellColor, corresponding to the cell color as detected in the searched area.

EMatrixCode.GetCellCorrectedColor

Corrected color of a cell.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.ECellColor GetCellCorrectedColor(
 int x,
 int y
 )
Euresys.Open_eVision.ECellColor GetCellCorrectedColor(
 Euresys.Open_eVision.EMatrixPosition position
 )
```

Parameters

x

The horizontal index of the cell.

y

The vertical index of the cell.

position

The position of the cell in the code.

Remarks

Returns the ECellColor corresponding to the theorethical cell color (the color that the cell should have in the searched area).

EMatrixCode.GetCellPosition

Position of a cell of the Data Matrix

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EQuadrangle GetCellPosition(
 int x,
 int y
 )
Euresys.Open_eVision.EQuadrangle GetCellPosition(
 Euresys.Open_eVision.EMatrixPosition position
 )
```

Parameters

x

The horizontal index of the cell.

y

The vertical index of the cell.

position

The position of the cell in the code.

EMatrixCode.IsECC200

Indicates if the Data Matrix is ECC200 or not.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool IsECC200
  { get; }
```

EMatrixCode.IsGraded

Returns true if the Matrix Code has been graded

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool IsGraded
  { get; }
```

EMatrixCode.IsGS1

Returns true if the decoded string uses the GS1 standard

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool IsGS1
  { get; }
```

EMatrixCode.Iso15415GradingParameters

ISO/IEC 15415 grading parameters

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EMatrixCodeIso15415GradingParameters Iso15415GradingParameters
  { get; }
```

EMatrixCode.Iso29158GradingParameters

ISO/IEC TR 29158 grading parameters

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EMatrixCodeIso29158GradingParameters Iso29158GradingParameters
  { get; }
```

EMatrixCode.IsReliable

Returns true if the code has been succesfully decoded and false otherwise.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool IsReliable
  { get; }
```

EMatrixCode.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode operator=(
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode other
 )
```

Parameters

other

The EMatrixCode instance to assign.

EMatrixCode.Position

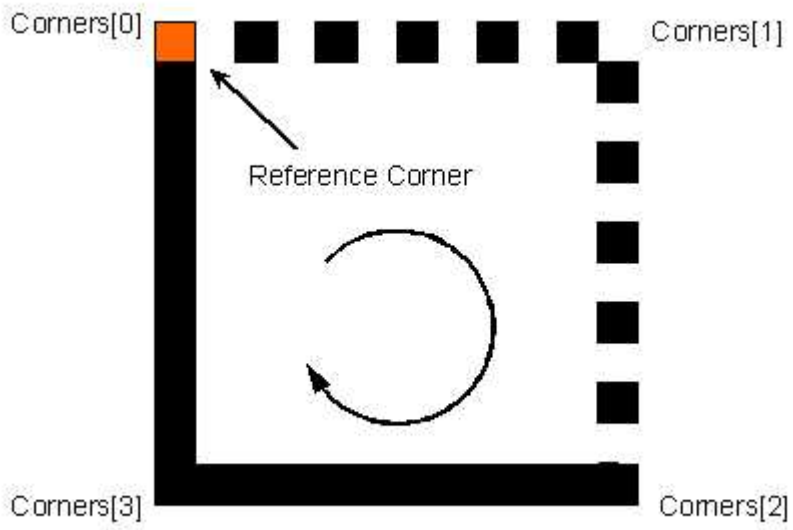
Position of the Data Matrix

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EQuadrangle Position
  { get; }
```

Remarks

The order of the corners of the EQuadrangle uses the following convention:



EMatrixCode.ReliabilityScore

Returns a confidence score on the fact that the code is actually a data matrix.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
float ReliabilityScore
  { get; }
```

Remarks

Returns 1.0f if the code has been succesfully decoded.

EMatrixCode.SemiT10GradingParameters

Semi T10-0701 grading parameters

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EMatrixCodeSemiT10GradingParameters SemiT10GradingParameters
  { get; }
```

EMatrixCode.SymbolHeight

Data Matrix Symbol Height (Number of cells in the vertical direction)

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
int SymbolHeight
  { get; }
```

EMatrixCode.SymbolPolarity

Symbol polarity as defined by ESymbolPolarity.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.ESymbolPolarity SymbolPolarity
  { get; }
```

EMatrixCode.SymbolWidth

Data Matrix Symbol Width (Number of cells in the horizontal direction)

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
int SymbolWidth
  { get; }
```

4.155. EMatrixCodeGrid Class

Represents a grid of Data Matrix Codes

Namespace: Euresys.Open_eVision.EasyMatrixCode2

Properties

EnableAll	Enable/Disable all cells
NumCols	Returns the number of columns in the grid
NumRows	Returns the number of rows in the grid

Methods

EMatrixCodeGrid	Creates an EMatrixCodeGrid object.
GetCellEnabled	Returns true if Cell is enabled and false otherwise
GetResults	Returns the MatrixCodes
operator=	Assignment operator
SetEnableCell	Enable/Disable Cell
SetEnableColumn	Enable/Disable Column
SetEnableRow	Enable/Disable Row

EMatrixCodeGrid.EMatrixCodeGrid

Creates an EMatrixCodeGrid object.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void EMatrixCodeGrid(
 )
```

```
void EMatrixCodeGrid(
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeGrid other
 )
```

```
void EMatrixCodeGrid(
 uint numCols,
 uint numRows
 )
```

Parameters

other

The reference EMatrixCodeGrid instance to copy this one from.

numCols

The number of columns in the grid.

numRows

The number of rows in the grid.

EMatrixCodeGrid.EnableAll

Enable/Disable all cells

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool EnableAll
  { get; set; }
```

Remarks

By default, all grid cells are enabled.

EMatrixCodeGrid.GetCellEnabled

Returns true if Cell is enabled and false otherwise

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool GetCellEnabled(
 uint column,
 uint row
 )
```

Parameters

column

-

row

-

Remarks

By default, all grid cells are enabled.

EMatrixCodeGrid.GetResults

Returns the MatrixCodes

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode[] GetResults(
 uint column,
 uint row
 )
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode[] GetResults(
 )
```

Parameters

column

The column of a cell.

row

The row of a cell.

EMatrixCodeGrid.NumCols

Returns the number of columns in the grid

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
uint NumCols
  { get; }
```

EMatrixCodeGrid.NumRows

Returns the number of rows in the grid

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
uint NumRows
  { get; }
```

EMatrixCodeGrid.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeGrid operator=(
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeGrid other
 )
```

Parameters

other

The EMatrixCodeGrid instance to assign.

EMatrixCodeGrid.SetEnableCell

Enable/Disable Cell

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void SetEnableCell(
 uint column,
 uint row,
 bool enable
 )
```

Parameters

column

-

row

-

enable

-

Remarks

By default, all grid cells are enabled.

EMatrixCodeGrid.SetEnableColumn

Enable/Disable Column

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void SetEnableColumn(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

EMatrixCodeGrid.SetEnableRow

Enable/Disable Row

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void SetEnableRow(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

4.156. EMatrixCodeReader Class

This class is deprecated.

A EMatrixCodeReader instance is a tool that processes an ROI and returns a EMatrixCode instance.
Deprecated, use EMatrixCodeReader instead.

Remarks

A EMatrixCodeReader has properties that allow customizing the reading process. One of these properties is EMatrixCodeReader::SearchParams, which is an instance of ESearchParamsType. This object embeds the parameter space where a Data Matrix code will be searched and has an interface of its own. The EMatrixCodeReader class is found in the Euresys namespace

Namespace: Euresys.Open_eVision

Properties

ComputeGrading	Allows to choose whether the grading properties of the EMatrixCode object will be computed by the EMatrixCodeReader::Reset, EMatrixCodeReader::Read or EMatrixCodeReader::LearnMore methods.
MaxHeightWidthRatio	Maximum value for a Data Matrix aspect ratio
MaximumPrintGrowth	Maximum reference value in use for normalization of the PrintGrowth quality indicator.
MinimumPrintGrowth	Minimum reference value in use for normalization of the PrintGrowth quality indicator.
NominalPrintGrowth	Nominal reference value in use for normalization of the PrintGrowth quality indicator.
SearchParams	Parameter space that the algorithm uses to read a Data Matrix code from an ROI.
TimeOut	Time-out for the EMatrixCodeReader::Learn, EMatrixCodeReader::LearnMore and EMatrixCodeReader::Read methods.

Methods

EMatrixCodeReader	Default constructor for EMatrixCodeReader objects.
GetLearnMaskElement	Allows to know which decoded parameters are learnt when the EMatrixCodeReader::Learn or EMatrixCodeReader::LearnMore methods are called.
Learn	Tries to locate, decode and read the Data Matrix code in the given ROI.
LearnMore	Tries to locate, decode and read the Data Matrix code in the given ROI.
Load	Saves a EMatrixCodeReader. The given ESerializer must have been created for writing.
Read	Tries to locate, decode and read the Data Matrix code in the given ROI.
Reset	Resets the parameter search space to its default: the full range of all parameters.
Save	Loads a EMatrixCodeReader. The given ESerializer must have been created for reading.
SetIso29158Calibration Parameters	Sets ISO/IEC 29158 calibration paramters
SetLearnMaskElement	Allows to choose which decoded parameters are learnt when the EMatrixCodeReader::Learn or EMatrixCodeReader::LearnMore methods are called.

EMatrixCodeReader.ComputeGrading

This property is deprecated.

Allows to choose whether the grading properties of the EMatrixCode object will be computed by the EMatrixCodeReader::Reset, EMatrixCodeReader::Read or EMatrixCodeReader::LearnMore methods.

Namespace: Euresys.Open_eVision

```
[C#]
bool ComputeGrading
  { get; set; }
```

Remarks

Default: false.

EMatrixCodeReader.EMatrixCodeReader

This method is deprecated.

Default constructor for EMatrixCodeReader objects.

Namespace: Euresys.Open_eVision

```
[C#]
void EMatrixCodeReader(
 )
```

EMatrixCodeReader.GetLearnMaskElement

This method is deprecated.

Allows to know which decoded parameters are learnt when the EMatrixCodeReader::Learn or EMatrixCodeReader::LearnMore methods are called.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetLearnMaskElement(
 Euresys.Open_eVision.ELearnParam index
 )
```

Parameters

index

Parameter identifier, as defined in ELearnParam

EMatrixCodeReader.Learn

This method is deprecated.

Tries to locate, decode and read the Data Matrix code in the given ROI.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCode Learn(
 Euresys.Open_eVision.EROIBW8 roi
 )
```

Parameters

roi

ROI in which the Data Matrix has to be found.

Remarks

If successful, it adds the parameters of the Data Matrix code found into the internal learning database. The decoding results can be found in the returned EMatrixCode object. The addition of the parameters of the Data Matrix code found into the internal learning database means that subsequent Read operations will be faster, but can only be performed on similar Data Matrix codes/conditions. Only the parameters that are tagged for learning are remembered for the subsequent EMatrixCodeReader::Read operations (see EMatrixCodeReader::SetLearnMaskElement). See the EMatrixCode::Found property for information about the outcome of the Learn process.

EMatrixCodeReader.LearnMore

This method is deprecated.

Tries to locate, decode and read the Data Matrix code in the given ROI.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCode LearnMore(
 Euresys.Open_eVision.EROIBW8 roi
 )
```

Parameters

roi

ROI in which the Data Matrix has to be found.

Remarks

If successful, it cumulates the parameters of the Data Matrix code found with those already present in the internal learning database. The decoding results can be found in the returned EMatrixCode object. The cumulation of the parameters of the Data Matrix code found with those already present in the internal learning database means that subsequent Read operations will be faster, but can only be performed on similar Data Matrix codes/conditions. Only the parameters that are tagged for learning are remembered for the subsequent EMatrixCodeReader::Read operations (see EMatrixCodeReader::SetLearnMaskElement). See the EMatrixCode::Found property for information about the outcome of the LearnMore process.

EMatrixCodeReader.Load

This method is deprecated.

Saves a EMatrixCodeReader. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
void Load(
 string path
 )
```

Parameters

serializer

The serializer.

path

A string containing the full path to the file.

EMatrixCodeReader.MaxHeightWidthRatio

This property is deprecated.

Maximum value for a Data Matrix aspect ratio

Namespace: Euresys.Open_eVision

[C#]

```
float MaxHeightWidthRatio
  { get; set; }
```

Remarks

This property allows controlling what kind of objects are considered as potential MatrixCode instances in the image. When objects are found in the image, only those where the bounding box has an aspect ratio smaller than this value are taken into account for digitization and decoding. The default value is 3.8, and should be adjusted if the MatrixCode cells in your image are non-square, or if your matrix code uses a very non-square symbology such as 32x8. The supplied value must lie between 0.0 and 5.0.

EMatrixCodeReader.MaximumPrintGrowth

This property is deprecated.

Maximum reference value in use for normalization of the PrintGrowth quality indicator.

Namespace: Euresys.Open_eVision

[C#]

```
float MaximumPrintGrowth
  { get; set; }
```

Remarks

Default: 2.0. After the standard, parameter PrintGrowth must be computed as normalized value related to three references: minimum, nominal and maximum values have to be provided. Parameter MeasuredPrintGrowth is the raw, un-normalized print quality parameter. It is computed as the measured area of the active cells over the area of ideal square cells, having sides equal to the pitches (such cells perfectly tile the symbol). Its value typically is on the order of unity. The PrintGrowth is derived from the MeasuredPrintGrowth by means of the three normalization parameters.

EMatrixCodeReader.MinimumPrintGrowth

This property is deprecated.

Minimum reference value in use for normalization of the PrintGrowth quality indicator.

Namespace: Euresys.Open_eVision

[C#]

```
float MinimumPrintGrowth
  { get; set; }
```

Remarks

Default: 0.0. After the standard, parameter PrintGrowth must be computed as normalized value related to three references: minimum, nominal and maximum values have to be provided. Parameter MeasuredPrintGrowth is the raw, un-normalized print quality parameter. It is computed as the measured area of the active cells over the area of ideal square cells, having sides equal to the pitches (such cells perfectly tile the symbol). Its value typically is on the order of unity. The PrintGrowth is derived from the MeasuredPrintGrowth by means of the three normalization parameters.

EMatrixCodeReader.NominalPrintGrowth

This property is deprecated.

Nominal reference value in use for normalization of the PrintGrowth quality indicator.

Namespace: Euresys.Open_eVision

[C#]

```
float NominalPrintGrowth
  { get; set; }
```

Remarks

Default: 1.0. After the standard, parameter PrintGrowth must be computed as normalized value related to three references: minimum, nominal and maximum values have to be provided. Parameter MeasuredPrintGrowth is the raw, un-normalized print quality parameter. It is computed as the measured area of the active cells over the area of ideal square cells, having sides equal to the pitches (such cells perfectly tile the symbol). Its value typically is on the order of unity. The PrintGrowth is derived from the MeasuredPrintGrowth by means of the three normalization parameters.

EMatrixCodeReader.Read

This method is deprecated.

Tries to locate, decode and read the Data Matrix code in the given ROI.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCode Read(
 Euresys.Open_eVision.EROIBW8 roi
 )
```

Parameters

roi

ROI in which the Data Matrix has to be found.

Remarks

The decoding results can be found in the returned EMatrixCode object. See the EMatrixCode::Found property for information about the outcome of the Read process.

Note. This function throws an exception if the matrix code in the given ROI can not be read.

EMatrixCodeReader.Reset

This method is deprecated.

Resets the parameter search space to its default: the full range of all parameters.

Namespace: Euresys.Open_eVision

```
[C#]
void Reset(
 )
```

Remarks

This does not modify the learning mask.

EMatrixCodeReader.Save

This method is deprecated.

Loads a EMatrixCodeReader. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
void Save(
 string path
 )
```

Parameters

serializer

The ESerializer object that is read from.

path

A string containing the full path to the file.

EMatrixCodeReader.SearchParams

This property is deprecated.

Parameter space that the algorithm uses to read a Data Matrix code from an ROI.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ESearchParamsType SearchParams
  { get; }
```

Remarks

It can be modified through automatic learning (using the EMatrixCodeReader::Learn or EMatrixCodeReader::LearnMore methods) or by using EMatrixCodeReader::SearchParams properties and methods.

EMatrixCodeReader.SetIso29158CalibrationParameters

This method is deprecated.

Sets ISO/IEC 29158 calibration paramters

Namespace: Euresys.Open_eVision

```
[C#]
void SetIso29158CalibrationParameters(
 float Rcal,
 float MLcal,
 float SRcal,
 float SRtarget
 )
```

Parameters

Rcal

Reported reflectance value, from a calibration standard.

MLcal

Mean of the light from a histogram of the calibrated standard.

SRcal

System response parameters(such as exposure and/or again) used to create an image of the calibration standard.

SRtarget

System response parameters(such as exposure and/or again) used to create an image of the symbole under test.

EMatrixCodeReader.SetLearnMaskElement

This method is deprecated.

Allows to choose which decoded parameters are learnt when the EMatrixCodeReader::Learn or EMatrixCodeReader::LearnMore methods are called.

Namespace: Euresys.Open_eVision

```
[C#]
void SetLearnMaskElement(
 Euresys.Open_eVision.ELearnParam index,
 bool value
 )
```

Parameters

index

Parameter identifier, as defined in ELearnParam.

value

true to enable the parameter for learning.

Remarks

In order to enable a parameter for learning, you need to set corresponding item of LearnMask to true. Default: all items are set to true.

EMatrixCodeReader.TimeOut

This property is deprecated.

Time-out for the EMatrixCodeReader::Learn, EMatrixCodeReader::LearnMore and EMatrixCodeReader::Read methods.

Namespace: Euresys.Open_eVision

```
[C#]
uint TimeOut
  { get; set; }
```

Remarks

If the processing time of one of these functions becomes longer than the set time-out, the processing is stopped and an exception is thrown. In that case, the error code of the exception is TimeoutReached. The time-out is set in microseconds. This time-out is not a real time-out. The processing is stopped as soon as possible after the time-out has been reached. This means that the time elapsed effectively in the method can be greater than the time-out in itself.

4.157. EMatrixCodeReader Class

An EMatrixCodeReader instance can detect, decode and grade matrixcodes in an ROI, it returns a vector of EMatrixCode instances.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

Properties

ComputeGrading	Allows to choose whether the grading properties of the EMatrixCode object will be computed by the EMatrixCodeReader::Read method. The default setting for this property is `false`.
EnableDMRE	Enables or disables the decoding of Datamatrix Rectangular Extension (DMRE).
EnablePermissiveDecoding	Enables or disables the decoding of codes containing partially incorrect information.
EnableReturnUnreliableCodes	Enable or disable unreliable codes to be returned.
Iso29158CalibrationParameters	ISO/IEC TR 29158 calibration parameters.
LearnPerformed	Returns true if some context information has been learned from a call to EMatrixCodeReader::Learn, and false otherwise.
MatrixCodeDimensionsRange	Sets or disables the range, in pixels, that the datamatrices sides dimensions must have to be detected.
MaxNumCodes	Maximum number of data matrices to find in a single Image/ROI.

ReadMode	The EReadMode used for the EMatrixCodeReader::Read method. The default value for this property is Speed.
ReadResults	Outputs the EMatrixCode that were found by the EMatrixCodeReader::Read method.
TimeOut	The timeout for the EMatrixCodeReader::Read and EMatrixCodeReader::Learn method in microseconds.

Methods

EMatrixCodeReader	Creates an EMatrixCodeReader object.
Learn	Learns the optimal parameter settings for detecting datamatrices in the given ROI.
Load	Load the configuration for this EMatrixCodeReader instance.
operator=	Assignment operator
Read	Tries to locate, decode and read data matrix codes in the given ROI.
ResetLearning	Forgets the learned parameter settings and resets their default values.
Save	Save the configuration for this EMatrixCodeReader instance.
StopProcess	Stops the EMatrixCodeReader::Read and/or EMatrixCodeReader::Learn process as soon as possible.
UnsetMatrixCodeDimensionsRange	-

EMatrixCodeReader.ComputeGrading

Allows to choose whether the grading properties of the EMatrixCode object will be computed by the EMatrixCodeReader::Read method. The default setting for this property is `false`.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool ComputeGrading
  { get; set; }
```

EMatrixCodeReader.EMatrixCodeReader

Creates an EMatrixCodeReader object.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void EMatrixCodeReader(
 )
```

```
void EMatrixCodeReader(
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeReader other
 )
```

Parameters

other

Another EMatrixCodeReader object to be copied in the new EMatrixCodeReader object.

EMatrixCodeReader.EnableDMRE

Enables or disables the decoding of Datamatrix Rectangular Extension (DMRE).

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool EnableDMRE
  { get; set; }
```

EMatrixCodeReader.EnablePermissiveDecoding

Enables or disables the decoding of codes containing partially incorrect information.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool EnablePermissiveDecoding
  { get; set; }
```

EMatrixCodeReader.EnableReturnUnreliableCodes

Enable or disable unreliable codes to be returned.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool EnableReturnUnreliableCodes
  { get; set; }
```

Remarks

By default, unreliable codes are not returned. Unreliable codes are objects which are likely to be data matrices, but which could not be decoded. These unreliably decoded codes will return false upon calling EMatrixCode.

EMatrixCodeReader.Iso29158CalibrationParameters

ISO/IEC TR 29158 calibration parameters.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EMatrixCodeIso29158CalibrationParameters
Iso29158CalibrationParameters
  { get; set; }
```

EMatrixCodeReader.Learn

Learns the optimal parameter settings for detecting datamatrices in the given ROI.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void Learn(
 Euresys.Open_eVision.EROIBW8 roi
 )
void Learn(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

roi

The ROI in which the data matrix codes have to be found.

region

-

Remarks

Throws an exception if EMatrixCodeReader returns true and the ROI dimensions are different from the ones used on previous calls.

EMatrixCodeReader.LearnPerformed

Returns true if some context information has been learned from a call to EMatrixCodeReader::Learn, and false otherwise.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
bool LearnPerformed
```

```
{ get; }
```

EMatrixCodeReader.Load

Load the configuration for this EMatrixCodeReader instance.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path from which to load the configuration.

serializer

The serializer.

EMatrixCodeReader.MatrixCodeDimensionsRange

Sets or disables the range, in pixels, that the datamatrices sides dimensions must have to be detected.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
Euresys.Open_eVision.EIntegerRange MatrixCodeDimensionsRange
 { get; set; }
```

Remarks

If this parameter is set by the user, it supersedes the value learned by the EMatrixCodeReader::Learn method. If this parameter is set after a EMatrixCodeReader::Learn, EMatrixCodeReader::ResetLearning will be called.

EMatrixCodeReader.MaxNumCodes

Maximum number of data matrices to find in a single Image/ROI.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
uint MaxNumCodes
  { get; set; }
```

Remarks

By default, this parameter is set to 1.

EMatrixCodeReader.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeReader operator=(
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeReader other
 )
```

Parameters

other

EMatrixCodeReader object to be copied.

EMatrixCodeReader.Read

Tries to locate, decode and read data matrix codes in the given ROI.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode[] Read(
 Euresys.Open_eVision.EROIBW8 roi
 )

Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode[] Read(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ERegion region
 )

Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode[] Read(
 Euresys.Open_eVision.EROIBW8 roi,
 int numCellsX,
 int numCellsY,
 float extension
 )
```

```
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ERectangleRegion area,
 int numCellsX,
 int numCellsY,
 float extension
 )
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.ERectangleRegion area,
 Euresys.Open_eVision.EasyMatrixCode2.EMatrixCodeGrid grid,
 float extension
 )
```

Parameters

roi

The ROI in which the data matrix codes have to be found.

region

Region into the search field where the data matrix codes have to be found.

numCellsX

Number of grid cells in the X direction

numCellsY

Number of grid cells in the Y direction

extension

Extension of the grid cells to allow cell overlap. For instance, 0.0f means no extension and 0.1f means a 10% cell size extension.

area

Rectangular Region used as the full grid area

grid

Grid with cell disabling capabilities

Remarks

Throws an exception if EMatrixCodeReader returns true and the ROI dimensions are different from the ones used on previous calls. The grid overload allows you to disable some cells of the grid if those cells are not supposed to contain datamatrix codes. See the EMatrixCodeGrid class documentation for more information.

EMatrixCodeReader.ReadMode

The EReadMode used for the EMatrixCodeReader::Read method. The default value for this property is Speed.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EasyMatrixCode2.EReadMode ReadMode
  { get; set; }
```

EMatrixCodeReader.ReadResults

Outputs the EMatrixCode that were found by the EMatrixCodeReader::Read method.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
Euresys.Open_eVision.EasyMatrixCode2.EMatrixCode[] ReadResults
  { get; }
```

EMatrixCodeReader.ResetLearning

Forgets the learned parameter settings and resets their default values.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void ResetLearning(
 )
```

EMatrixCodeReader.Save

Save the configuration for this EMatrixCodeReader instance.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path to which to save the configuration.

serializer

The serializer.

EMatrixCodeReader.StopProcess

Stops the EMatrixCodeReader::Read and/or EMatrixCodeReader::Learn process as soon as possible.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void StopProcess(
 )
```

Remarks

When this method is called the process is stopped at the first checkpoint.

EMatrixCodeReader.TimeOut

The timeout for the EMatrixCodeReader::Read and EMatrixCodeReader::Learn method in microseconds.

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
System.UInt64 TimeOut
  { get; set; }
```

Remarks

If the processing time of one of these methods becomes longer than the set time-out period, the process is stopped.
The EMatrixCodeReader::Read method will return all the codes it has decoded up to that point.
The EMatrixCodeReader::Learn method will only learn from those codes it has found within the time-out period.
Note that the time-out period is not exact: the process is stopped at the first checkpoint after the time-out period has elapsed.

EMatrixCodeReader.UnsetMatrixCodeDimensionsRange

-

Namespace: Euresys.Open_eVision.EasyMatrixCode2

```
[C#]
void UnsetMatrixCodeDimensionsRange(
 )
```

4.158. EMeasurementUnit Class

The measurement units that are supported by Open eVision.

Remarks

Measurement units are used to represent physical units, such as "meter" or "inch", and ease conversions between different unit systems. They are used to build dimensional values. The following length measurement units are predefined: um (microns), mm, cm, dm, m, Dm, Hm, Km, mil (1/1000 inch), inch, foot, yard, mile.

Namespace: Euresys.Open_eVision

Properties

Magnitude	Relative magnitude of this unit, with respect to a standard unit (e.g. 1 mm = 0.001 m).
Name	Pointer to a NULL-terminated string containing the unit abbreviation.

Methods

ConversionFactorTo	Returns the factor needed to convert from this measurement unit to a second one.
EMeasurementUnit	Constructs a measurement unit.
GetStockMeasurementUnit	Returns a predefined measurement unit.

EMeasurementUnit.ConversionFactorTo

Returns the factor needed to convert from this measurement unit to a second one.

Namespace: Euresys.Open_eVision

```
[C#]
float ConversionFactorTo(
 Euresys.Open_eVision.EMeasurementUnit Unit
 )
```

Parameters

Unit

Reference to the second measurement unit.

EMeasurementUnit.EMeasurementUnit

Constructs a measurement unit.

Namespace: Euresys.Open_eVision

```
[C#]
void EMeasurementUnit(
 float magnitude,
 string name
 )
```

Parameters

magnitude

Relative magnitude of this unit with respect to a standard (e.g. 1 mm = 0.001 m).

name

Unit abbreviation (e.g. "mm").

EMeasurementUnit.GetStockMeasurementUnit

Returns a predefined measurement unit.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMeasurementUnit GetStockMeasurementUnit(
 Euresys.Open_eVision.EStockMeasurementUnit unit
 )
```

Parameters

unit

Enum defining the predefined measurement unit.

EMeasurementUnit.Magnitude

Relative magnitude of this unit, with respect to a standard unit (e.g. 1 mm = 0.001 m).

Namespace: Euresys.Open_eVision

```
[C#]
float Magnitude
  { get; set; }
```

EMeasurementUnit.Name

Pointer to a NULL-terminated string containing the unit abbreviation.

Namespace: Euresys.Open_eVision

[C#]

```
string Name
  { get; set; }
```

4.159. EMemorySerializer Class

Handles and EMemorySerializer context

Base Class:ESerializer
Namespace: Euresys.Open_eVision

Properties

Buffer	Address of the internal buffer.
BufferSize	Size of the internal buffer
CurrentPosition	Current position in the buffer
Writing	Checks if the serializer is in writing mode

Methods

Close	Closes the serializer

EMemorySerializer.Buffer

Address of the internal buffer.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr Buffer
  { get; }
```

EMemorySerializer.BufferSize

Size of the internal buffer

Namespace: Euresys.Open_eVision

[C#]

```
uint BufferSize
  { get; }
```

EMemorySerializer.Close

Closes the serializer

Namespace: Euresys.Open_eVision

[C#]

```
void Close(
 )
```

EMemorySerializer.CurrentPosition

Current position in the buffer

Namespace: Euresys.Open_eVision

[C#]

```
uint CurrentPosition
  { get; }
```

EMemorySerializer.Writing

Checks if the serializer is in writing mode

Namespace: Euresys.Open_eVision

[C#]

```
override bool Writing
  { get; }
```

4.160. EMesh Class

Represents a 3D meshed object (https://en.wikipedia.org/wiki/Triangle_mesh).

Namespace: Euresys.Open_eVision.Easy3D

Properties

Normals	Returns a pointer to the array (of E3DPoint) representing the list of normals. If the EMesh object has no triangle mesh data, this method returns NULL.
PointCloud	Returns the point cloud of the EMesh object.

TriangleCount	Returns the number of triangles. If the EMesh object has no triangle mesh data, the method returns 0.
TriangleIndexes	Returns a pointer to the index array (an array of 32 bit signed integers) representing the list of triangles. Indexes are referring to the array of E3DPoint. A triangle is defined by 3 indexes (T1a T1b T1c T2a T2b T2c T3a ....). The triangle index array size is a multiple of 3. Index values must be in [0, N[where N is the number of points in the point cloud. If the EMesh object has no triangle mesh data, this method returns NULL.

Methods

Clear	Empties the Mesh.
ComputePlaneBehind	Returns the E3DPlane with given normal on which the EMesh lays. This is useful when projecting an EMesh on an EZMap.
EMesh	Creates an EMesh object.
Load	Loads the EMesh. Supported formats are Open eVision proprietary and STL. The given ESerializer must have been created for reading.
LoadSTL	Loads a triangle mesh from a STL file (https://en.wikipedia.org/wiki/STL_(file_format))
operator=	Assignment operator.
Save	Saves the EMesh. Supported formats are Open eVision proprietary and STL. The given ESerializer must have been created for writing.
SaveSTL	Saves the triangle mesh to an STL file (https://en.wikipedia.org/wiki/STL_(file_format)).

EMesh.Clear

Empties the Mesh.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Clear(
 )
```

EMesh.ComputePlaneBehind

Returns the E3DPlane with given normal on which the EMesh lays. This is useful when projecting an EMesh on an EZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane ComputePlaneBehind(
 Euresys.Open_eVision.Easy3D.E3DPoint normal,
 float margin
 )
```

Parameters

normal

The normal of the plane.

margin

Let P be the plane, A point of the EMesh closest to P and B the of the EMesh furthest to B. margin = dist(P, A) / dist(P, B). Must be positive. Default: 0.02.

EMesh.EMesh

Creates an EMesh object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EMesh(
 )

void EMesh(
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 int[] triangleIndexes
 )

void EMesh(
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 int[] triangleIndexes,
 Euresys.Open_eVision.Easy3D.E3DPoint[] normals
 )

void EMesh(
 Euresys.Open_eVision.Easy3D.EMesh other
 )
```

Parameters

pointCloud

A point cloud

triangleIndexes

The triangle mesh is a list of indexes, referring to the array contained in "pointCloud".
A triangle is defined by 3 indexes (T1a T1b T1c T2a T2b T2c T3a ....).
Index values must be in [0, N[with N the number of points in the EPointCloud.
The triangle index array size is a multiple of 3.

normals

Normals of each of the faces of the mesh. Must be the third of the size of "triangleIndexes".
If not provided, they will be computed automatically from the faces by assuming the vertices are listed in counter-clock-wise order from outside (which is the convention used by the stl file format).

other

Another EMesh.

EMesh.Load

Loads the EMesh. Supported formats are Open eVision proprietary and STL. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EMesh.LoadSTL

Loads a triangle mesh from a STL file (https://en.wikipedia.org/wiki/STL_(file_format))

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadSTL(
 string path
 )
```

Parameters

path

The path to the STL file.

EMesh.Normals

Returns a pointer to the array (of E3DPoint) representing the list of normals.
If the EMesh object has no triangle mesh data, this method returns NULL.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr Normals
  { get; }
```

EMesh.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EMesh operator=(
 Euresys.Open_eVision.Easy3D.EMesh other
 )
```

Parameters

other

-

EMesh.PointCloud

Returns the point cloud of the EMesh object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPointCloud PointCloud
  { get; }
```

EMesh.Save

Saves the EMesh. Supported formats are Open eVision proprietary and STL. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

EMesh.SaveSTL

Saves the triangle mesh to an STL file (https://en.wikipedia.org/wiki/STL_(file_format)).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveSTL(
 string path,
 bool binary
 )
```

Parameters

path
The path to the STL file.

binary
Optional parameter, activates the binary file format (default is true).

EMesh.TriangleCount

Returns the number of triangles.
If the EMesh object has no triangle mesh data, the method returns 0.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int TriangleCount
  { get; }
```

EMesh.TriangleIndexes

Returns a pointer to the index array (an array of 32 bit signed integers) representing the list of triangles. Indexes are referring to the array of E3DPoint.
A triangle is defined by 3 indexes (T1a T1b T1c T2a T2b T2c T3a ....). The triangle index array size is a multiple of 3.
Index values must be in [0, N[where N is the number of points in the point cloud.
If the EMesh object has no triangle mesh data, this method returns NULL.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr TriangleIndexes
  { get; }
```

4.161. EMeshToZMapConverter Class

Computes an EZMap from an EMesh. The value of the pixels of the ZMap are the distance between the 3D points and the reference plane.
All 3D points under the reference plane are discarded.
Various options can be set with methods EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::SetFillMode, EMeshToZMapConverter::SetMapXYResolution, EMeshToZMapConverter::MapZResolution, EMeshToZMapConverter::OrientationVector...
When the conversion is called without defining specific parameters, the algorithm uses the following options:
- The reference plane is the horizontal plane.
- The orientation vector is selected automatically.
- The origin is set as the lowest left position of the projected point cloud on the reference plane.
- The resolution (the dimensions of the Z map) is estimated to have approximately one Point Cloud point per ZMap pixels.
- The scale is calculated from the point cloud ranges and the estimated resolution.
- The fill mode is enabled and the method is set to 'EFillUndefinedPixelsDirection_Local' (see method EDepthMap8::FillUndefinedPixels).

Namespace: Euresys.Open_eVision.Easy3D

Properties

Extension	Sets a metric value used to enlarge the point cloud 3D domain. That value affects X,Y and Z directions and can be used to generate an EZMap with borders of undefined pixels. Default value is 0, which means a ZMap without border.

FillUndefinedPixelsDirection	Gets the undefined pixel fill direction (see EFillUndefinedPixelsDirection).
FillUndefinedPixelsMethod	Gets the undefined pixel fill method (see EFillUndefinedPixelsMethod).
MapHeight	Gets the required height (number of pixels) of the generated EZMap. By default, the required size is not set.
MapWidth	Gets the required width (number of pixels) of the generated EZMap. By default, the required size is not set.
MapXResolution	Gets the resolution of the EZMap pixels along the X axis.
MapYResolution	Gets the resolution of the EZMap pixels along the Y axis.
MapZResolution	Gets/sets the EZMap Z resolution, in world space units per gray value. The resolution is used to compute the transformation of the world Z position to an integer 8, 16 or 32 bits pixel value.
OrientationVector	Sets an explicit orientation for the EZMap. Overrides the orientation mode given by the method EMeshToZMapConverter::OrientationVectorMode.
OrientationVectorMode	Chooses the EZMap orientation from a list of predefined axis, automatic mode or user defined vector. Use EMeshToZMapConverter::OrientationVector to set an explicit orientation vector for the ZMap.
Origin	Chooses the EZMap origin. It is the 3D world position used as origin of the ZMap upper left pixel (0,0).
ReferencePlane	Sets the E3DPlane reference plane. The resulting EZMap is the distance of the 3D points above that plane. 3D points below the reference plane are discarded.
ReferencePlaneMode	Sets an axis aligned reference plane. Overrides the explicit reference plane given by the method EMeshToZMapConverter::ReferencePlane.
WorldToZMapTransform	Explicitly sets the world to ZMap transformation. EMeshToZMapConverter::WorldToZMapTransform overrides the settings done by EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::OrientationVector and EMeshToZMapConverter::Origin. That E3DTransformMatrix transform expresses how the world positions are transformed to the EZMap space. The matrix must be a rigid transformation (translation and rotation only). The resolution of the ZMap are defined by the EMeshToZMapConverter::SetMapXYResolution and EMeshToZMapConverter::MapZResolution methods.

ZMaptoWorldTransform	Explicitly sets the ZMap to World transformation. "SetZMaptoWorldTransform" overrides the settings done by EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::OrientationVector and EMeshToZMapConverter::Origin. That E3DTransformMatrix transform expresses how the EZMap positions are transformed to the World space. The matrix must be a rigid transformation (translation and rotation only). The resolutions of the World are defined by the EMeshToZMapConverter::SetMapXYResolution and EMeshToZMapConverter::MapZResolution methods.

Methods

Convert	Computes an EZMap from a world space EMesh. The value of the pixels of the ZMap are the distance between the 3D triangles and the reference plane. Various options can be set with methods EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::OrientationVector, EMeshToZMapConverter::SetMapSize, ...
EMeshToZMapConverter	Creates an EMeshToZMapConverter object.
EnableFillMode	Enables or disables fill mode. Fill mode parameters are defined by method EMeshToZMapConverter::SetFillMode or EMeshToZMapConverter::SetFillModeMedian. Fill mode is enabled by default. If fill mode is disabled, undefined pixels may remain in the EZMap.
IsFillModeEnabled	Tells if the fill mode is enabled or not. Use EMeshToZMapConverter::EnableFillMode to toggle the fill mode and EMeshToZMapConverter::SetFillMode or EMeshToZMapConverter::SetFillModeMedian to set the filling parameters.
Load	Loads the converter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator
operator==	Comparison operator
Save	Saves the converter configuration. The given ESerializer must have been created for writing.
SetFillMode	Inpainting options used to fill the "holes" in the EZMap. A hole exists when no 3D point is projected at that pixel position in the ZMap.
SetFillModeMedian	Inpainting options used to fill the "holes" in the EZMap using a median rectangular kernel of odd size. A hole exists when no 3D point is projected at that pixel position in the ZMap.
SetMapSize	Sets the required size of the generated EZMap; expressed in number of pixels for width and height dimensions. By default, the required size is not set.

SetMapXYResolution	Sets the resolution (possibly anisotropic) of the EZMap pixels along the X and Y axes, in world space units per pixel (e.g mm/pixel). The resolution is used to compute the ZMap size (width and height), depending on the projected point cloud on the reference plane.
UnsetMapSize	Unsets the resolution. Lets the conversion decides for the optimum resolution, depending on the projected point cloud and pixel scale.
UnsetMapXYResolution	Unsets the X and Y resolutions. Lets the conversion decide the optimal resolution, depending on the projected point cloud and EZMap size.
UnsetMapZResolution	Unsets the ZMap Z resolution. Lets the conversion decide the optimal Z resolution.
UnsetOrigin	Lets the conversion process decides for the EZMap origin position (based on projected point cloud on the reference plane). Use EMeshToZMapConverter::Origin to enable and choose the ZMap origin.
UnsetWorldToZMapTransform	Disables the explicit world to ZMap transformation, set with EMeshToZMapConverter::WorldToZMapTransform.

EMeshToZMapConverter.Convert

Computes an EZMap from a world space EMesh. The value of the pixels of the ZMap are the distance between the 3D triangles and the reference plane. Various options can be set with methods EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::OrientationVector, EMeshToZMapConverter::SetMapSize, ...

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Convert(
 Euresys.Open_eVision.Easy3D.EMesh obj,
 Euresys.Open_eVision.Easy3D.EZMap8 zmap
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EMesh obj,
 Euresys.Open_eVision.Easy3D.EZMap16 zmap
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EMesh obj,
 Euresys.Open_eVision.Easy3D.EZMap32f zmap
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EMesh obj,
 Euresys.Open_eVision.Easy3D.EZMap zmap
 )
```

Parameters

obj

The input 3D mesh.

zmap

The generated ZMap in 8, 16 or 32 bits format.

EMeshToZMapConverter.EMeshToZMapConverter

Creates an EMeshToZMapConverter object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EMeshToZMapConverter(
 )
void EMeshToZMapConverter(
 Euresys.Open_eVision.Easy3D.EMeshToZMapConverter other
 )
```

Parameters

other

Reference to the EMeshToZMapConverter object used for the initialization.

EMeshToZMapConverter.EnableFillMode

Enables or disables fill mode. Fill mode parameters are defined by method EMeshToZMapConverter::SetFillMode or EMeshToZMapConverter::SetFillModeMedian.
Fill mode is enabled by default. If fill mode is disabled, undefined pixels may remain in the EZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EnableFillMode(
 bool state
 )
```

Parameters

state

Set to true to enable fill mode.

EMeshToZMapConverter.Extension

Sets a metric value used to enlarge the point cloud 3D domain.
That value affects X,Y and Z directions and can be used to generate an EZMap with borders of undefined pixels.
Default value is 0, which means a ZMap without border.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Extension
  { get; set; }
```

EMeshToZMapConverter.FillUndefinedPixelsDirection

Gets the undefined pixel fill direction (see EFillUndefinedPixelsDirection).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection FillUndefinedPixelsDirection
  { get; }
```

EMeshToZMapConverter.FillUndefinedPixelsMethod

Gets the undefined pixel fill method (see EFillUndefinedPixelsMethod).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod FillUndefinedPixelsMethod
  { get; }
```

EMeshToZMapConverter.IsFillModeEnabled

Tells if the fill mode is enabled or not.
Use EMeshToZMapConverter::EnableFillMode to toggle the fill mode and EMeshToZMapConverter::SetFillMode or EMeshToZMapConverter::SetFillModeMedian to set the filling parameters.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsFillModeEnabled(
 )
```

EMeshToZMapConverter.Load

Loads the converter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EMeshToZMapConverter.MapHeight

Gets the required height (number of pixels) of the generated EZMap.
By default, the required size is not set.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int MapHeight
  { get; }
```

EMeshToZMapConverter.MapWidth

Gets the required width (number of pixels) of the generated EZMap.
By default, the required size is not set.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int MapWidth
  { get; }
```

EMeshToZMapConverter.MapXResolution

Gets the resolution of the EZMap pixels along the X axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MapXResolution
  { get; }
```

EMeshToZMapConverter.MapYResolution

Gets the resolution of the EZMap pixels along the Y axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MapYResolution
  { get; }
```

EMeshToZMapConverter.MapZResolution

Gets/sets the EZMap Z resolution, in world space units per gray value.
The resolution is used to compute the transformation of the world Z position to an integer 8, 16 or 32 bits pixel value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MapZResolution
  { get; set; }
```

EMeshToZMapConverter.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EMeshToZMapConverter operator=(
 Euresys.Open_eVision.Easy3D.EMeshToZMapConverter other
 )
```

Parameters

other

Reference to the EMeshToZMapConverter object used for the assignment.

EMeshToZMapConverter.operator==

Comparison operator

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.EMeshToZMapConverter other
 )
```

Parameters

other

Reference to the EMeshToZMapConverter object used for the comparison.

EMeshToZMapConverter.OrientationVector

Sets an explicit orientation for the EZMap.
Overrides the orientation mode given by the method EMeshToZMapConverter::OrientationVectorMode.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint OrientationVector
  { get; set; }
```

Remarks

The direction should be an E3DPoint representing the expected direction of the X (width) axis of the ZMap.
That direction will be used after projection on the reference plane normal.
That direction must NOT be aligned with the reference plane normal.

EMeshToZMapConverter.OrientationVectorMode

Chooses the EZMap orientation from a list of predefined axis, automatic mode or user defined vector.
Use EMeshToZMapConverter::OrientationVector to set an explicit orientation vector for the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EZMapOrientationVectorMode OrientationVectorMode
  { get; set; }
```

Remarks

Choose between Automatic mode (default), world space axis or explicit user defined vector (see EZMapOrientationVectorMode).

EMeshToZMapConverter.Origin

Chooses the EZMap origin. It is the 3D world position used as origin of the ZMap upper left pixel (0,0).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint Origin
  { get; set; }
```

Remarks

That position will be projected on the reference plane.
To let the conversion chooses for the origin, call EMeshToZMapConverter::UnsetOrigin.

EMeshToZMapConverter.ReferencePlane

Sets the E3DPlane reference plane.
The resulting EZMap is the distance of the 3D points above that plane.
3D points below the reference plane are discarded.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPlane ReferencePlane
  { get; set; }
```

EMeshToZMapConverter.ReferencePlaneMode

Sets an axis aligned reference plane.
Overrides the explicit reference plane given by the method EMeshToZMapConverter::ReferencePlane.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EZMapReferencePlaneMode ReferencePlaneMode
```

```
{ get; set; }
```

Remarks

Choose between X, Y or Z reference plane (see EZMapReferencePlaneMode).
The plane offset is set automatically on the point cloud lowest 3D point.

EMeshToZMapConverter.Save

Saves the converter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

Pointer to the ESerializer created for writing.

EMeshToZMapConverter.SetFillMode

Inpainting options used to fill the "holes" in the EZMap. A hole exists when no 3D point is projected at that pixel position in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetFillMode(
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

direction

Direction in which the undefined pixels are filled in a depthmap from EFillUndefinedPixelsDirection

method

Which values used to fill the undefined pixels in a depthmap from EFillUndefinedPixelsMethod

EMeshToZMapConverter.SetFillModeMedian

Inpainting options used to fill the "holes" in the EZMap using a median rectangular kernel of odd size. A hole exists when no 3D point is projected at that pixel position in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFillModeMedian(
 uint halfKernelX,
 uint halfKernelY
 )
```

Parameters

halfKernelX

-

halfKernelY

-

EMeshToZMapConverter.SetMapSize

Sets the required size of the generated EZMap; expressed in number of pixels for width and height dimensions.
By default, the required size is not set.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetMapSize(
 int width,
 int height
 )
```

Parameters

width

The required width for the Generated ZMap.

height

The required height for the Generated ZMap.

EMeshToZMapConverter.SetMapXYResolution

Sets the resolution (possibly anisotropic) of the EZMap pixels along the X and Y axes, in world space units per pixel (e.g mm/pixel).
The resolution is used to compute the ZMap size (width and height), depending on the projected point cloud on the reference plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetMapXYResolution(
 float resolution
 )
void SetMapXYResolution(
 float resolutionX,
 float resolutionY
 )
```

Parameters

resolution

The resolution for the isotropic case.

resolutionX

The resolution for the X axis.

resolutionY

The resolution for the Y axis.

Remarks

The isotropic scale, for X and Y axis is in metric world units.

EMeshToZMapConverter.UnsetMapSize

Unsets the resolution. Lets the conversion decides for the optimum resolution, depending on the projected point cloud and pixel scale.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetMapSize(
 )
```

EMeshToZMapConverter.UnsetMapXYResolution

Unsets the X and Y resolutions. Lets the conversion decide the optimal resolution, depending on the projected point cloud and EZMap size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetMapXYResolution(
 )
```

EMeshToZMapConverter.UnsetMapZResolution

Unsets the ZMap Z resolution. Lets the conversion decide the optimal Z resolution.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void UnsetMapZResolution(
 )
```

EMeshToZMapConverter.UnsetOrigin

Lets the conversion process decides for the EZMap origin position (based on projected point cloud on the reference plane).
Use EMeshToZMapConverter::Origin to enable and choose the ZMap origin.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void UnsetOrigin(
 )
```

EMeshToZMapConverter.UnsetWorldToZMapTransform

Disables the explicit world to ZMap transformation, set with EMeshToZMapConverter::WorldToZMapTransform.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void UnsetWorldToZMapTransform(
 )
```

EMeshToZMapConverter.WorldToZMapTransform

Explicitly sets the world to ZMap transformation.
EMeshToZMapConverter::WorldToZMapTransform overrides the settings done by EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::OrientationVector and EMeshToZMapConverter::Origin.
That E3DTransformMatrix transform expresses how the world positions are transformed to the EZMap space.
The matrix must be a rigid transformation (translation and rotation only).
The resolution of the ZMap are defined by the EMeshToZMapConverter::SetMapXYResolution and EMeshToZMapConverter::MapZResolution methods.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix WorldToZMapTransform
  { get; set; }
```

EMeshToZMapConverter.ZMaptoWorldTransform

Explicitly sets the ZMap to World transformation.
"SetZMaptoWorldTransform" overrides the settings done by EMeshToZMapConverter::ReferencePlane, EMeshToZMapConverter::OrientationVector and EMeshToZMapConverter::Origin.
That E3DTransformMatrix transform expresses how the EZMap positions are transformed to the World space.
The matrix must be a rigid transformation (translation and rotation only).
The resolutions of the World are defined by the EMeshToZMapConverter::SetMapXYResolution and EMeshToZMapConverter::MapZResolution methods.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix ZMaptoWorldTransform
  { get; set; }
```

4.162. EMovingAverage Class

Temporal integration of a number of images to reduce noise.

Namespace: Euresys.Open_eVision

Properties

SrcImage	Returns the image in which you must store the next image to be averaged.

Methods

Average	Performs averaging of the source image with the preceding ones, and computes the de-noised image.
EMovingAverage	Constructs an EMovingAverage object.
GetSize	Queries a moving average context for the current parameter settings.
Reset	Restarts the average process as if no image had ever been handed to the EMovingAverage object.
SetSize	Initializes a moving average context with appropriate parameters.

EMovingAverage.Average

Performs averaging of the source image with the preceding ones, and computes the de-noised image.

Namespace: Euresys.Open_eVision

```
[C#]
void Average(
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
void Average(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage
 )
```

Parameters

destinationImage

Pointer to the destination image.

sourceImage

Pointer to the source image.

Remarks

The overload with only the destinationImage may be used only when the buffer allocation scheme has been set to internal (see EMovingAverage::SetSize or EMovingAverage::EMovingAverage)

EMovingAverage.EMovingAverage

Constructs an EMovingAverage object.

Namespace: Euresys.Open_eVision

```
[C#]
void EMovingAverage(
 )
void EMovingAverage(
 uint period,
 int width,
 int height,
 bool internalAllocationScheme
 )
```

Parameters

period

Number of images on which to integrate. A power of 2 is recommended.

width

Image width (all images used for averaging must be of the same size).

height

Image height (all images used for averaging must be of the same size).

internalAllocationScheme

Buffer allocation scheme. When true, the moving average context provides the image to be acquired into (see member EMovingAverage::SrcImage).

Remarks

The default constructor constructs a void moving average context. A void moving average context has no internal buffers allocated and cannot be used for integration. Use the EMovingAverage::SetSize member after construction, or the initializing constructor instead. The sizing constructor constructs and initializes a moving average context.

EMovingAverage.GetSize

Queries a moving average context for the current parameter settings.

Namespace: Euresys.Open_eVision

```
[C#]
void GetSize(
 ref uint numberOfImages,
 ref int imageWidth,
 ref int imageHeight,
 ref bool internalAllocationScheme
 )
```

Parameters

numberOfImages

Number of images on which to integrate.

imageWidth

Image width (all images used for averaging must be of the same size).

imageHeight

Image height (all images used for averaging must be of the same size).

internalAllocationScheme

Buffer allocation scheme. When true, the moving average context provides the image to be acquired into (see member EMovingAverage::SrcImage).

EMovingAverage.Reset

Restarts the average process as if no image had ever been handed to the EMovingAverage object.

Namespace: Euresys.Open_eVision

```
[C#]
void Reset(
 )
```

Remarks

The behavior is thus the same as after a EMovingAverage::SetSize operation.

EMovingAverage.SetSize

Initializes a moving average context with appropriate parameters.

Namespace: Euresys.Open_eVision

```
[C#]
void SetSize(
 uint numberOfImages,
 int imageWidth,
 int imageHeight,
 bool internalAllocationScheme
 )
```

Parameters

numberOfImages

Number of images on which to integrate. A power of 2 is recommended.

imageWidth

Image width.

imageHeight

Image height.

internalAllocationScheme

Buffer allocation scheme. When true, the moving average context provides the image to be acquired into (see member EMovingAverage::SrcImage).

EMovingAverage.SrcImage

Returns the image in which you must store the next image to be averaged.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW8 SrcImage
  { get; }
```

Remarks

This method may be used only when the buffer allocation scheme has been set to internal (see EMovingAverage::SetSize or EMovingAverage::EMovingAverage)

4.163. EObject Class

This class represents an object (blob) in an encoded image.

Remarks

This class inherits from the ECodedElement class and provides additional methods to access the holes of a particular object.

The extraction of the holes is lazy. This means that the holes are not computed before they get accessed. For this reason, the first access to the holes is slower than the subsequent accesses. On the other hand, the applications that do not make use of the holes are not penalized by the cost of hole extraction.

Base Class:ECodedElement

Namespace: Euresys.Open_eVision

Properties

HoleCount	Returns the number of holes in the object.

Methods

EObject	-
GetHole	Returns a specified hole in the object.
operator=	-

EObject.EObject

-

Namespace: Euresys.Open_eVision

```
[C#]
void EObject(
 Euresys.Open_eVision.EObject other
 )
```

Parameters

other

-

EObject.GetHole

Returns a specified hole in the object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EHole GetHole(
 uint index
 )
Euresys.Open_eVision.EHole GetHole(
 uint index
 )
```

Parameters

index

The index of the hole of interest.

EObject.HoleCount

Returns the number of holes in the object.

Namespace: Euresys.Open_eVision

[C#]

```
uint HoleCount
  { get; }
```

EObject.operator=

-

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObject operator=(
 Euresys.Open_eVision.EObject other
 )
```

Parameters

other

-

4.164. EObjectBasedCalibrationGenerator Class

Represents an object-based 3D calibration generator.
The class performs the computation of a calibration model based on the scan of the reference object.

Base Class:ECalibrationGenerator

Namespace: Euresys.Open_eVision.Easy3D

Properties

CalibrationObjectScaleX	Returns the X axis scale of the calibration object. Deprecated: you should use @EObjectBasedCalibrationGenerator::GetCalibrationObjectSizeA@ instead.
CalibrationObjectScaleY	Returns the Y axis scale of the calibration object. Deprecated: you should use @EObjectBasedCalibrationGenerator::GetCalibrationObjectSizeB@ instead.
CalibrationObjectScaleZ	Returns the Z axis scale of the calibration object. Deprecated: you should use @EObjectBasedCalibrationGenerator::GetCalibrationObjectSizeC@ instead.
CalibrationObjectSizeA	Returns the 'A' size of the calibration object.
CalibrationObjectSizeB	Returns the 'B' size of the calibration object.
CalibrationObjectSizeC	Returns the 'C' size of the calibration object.
NumCalibrationPasses	Sets/Gets the number of calibration passes. Each passes will refine the calibration model but the computation will be longer. The number of passes is 1 by default.
PrecisionVsSpeedTradeOff	Sets/Gets the trade-off between precision and speed for the calibration. The Precision vs speed trade-off mode from EObjectBasedCalibrationPrecisionVsSpeedTradeOff is EObjectBasedCalibrationPrecisionVsSpeedTradeOff_Balanced by default.
RangeX	Sets/Gets the 'X' axis range for the calibration object detection in the EDepthMap. If max value is smaller than min value, then max will not be used, we use depth map width - 1 instead. If min value is smaller than 0, then min will not be used, we use 0 instead.
RangeY	Sets/Gets the 'Y' axis range for the calibration object detection in the depth map. If max value is smaller than min value, then max will not be used, we use depth map height - 1 instead. If min value is smaller than 0, then min will not be used, we use 0 instead.
RangeZ	Sets/Gets the 'Z' axis range for the calibration object detection in the depth map. if max value is smaller than min value, then max will not be used, we use the maximum float value instead. if min value is smaller than 0, then min will not be used, we use 0 instead.

Methods

Compute	Computes an EObjectBasedCalibrationModel from the EDepthMap of the calibration object.
EObjectBasedCalibrationGenerator	Creates a EObjectBasedCalibrationGenerator.
GetCalibrationObjectType	Gets the EObjectBasedCalibrationType used for the computation of the EObjectBasedCalibrationModel. The type of the object used for the calibration is E3DObjectBasedCalibrationType_NotDefined by default.
Load	Loads the parameters used by the object based calibration generator.
operator=	Assignment operator.
Save	Saves the parameters used by the object based calibration generator.
SetCalibrationObjectScale	Sets the scale of your target calibration model compared to a reference model. Refer to the user guide for the EObjectBasedCalibrationModel reference design. Use that value to set the unit of the calibrated positions in the point cloud. The scale will affect the world coordinates after conversion of the EDepthMap to EPointCloud. For example, if "1 reference unit" is equal to "10 millimeters", set "10" as scale value. Then applying the calibration will produce results in millimeters. Changing these values affect the calibration object sizes defined by EObjectBasedCalibrationGenerator::SetCalibrationObjectType. Deprecated: you should use @EObjectBasedCalibrationGenerator::SetCalibrationObjectType@ instead. Note that the scaleX/Y/Z and sizeA/B/C arguments aren't the same values.
SetCalibrationObjectType	Sets the EObjectBasedCalibrationType used for the computation of the EObjectBasedCalibrationModel. The type of the object used for the calibration is E3DObjectBasedCalibrationType_NotDefined by default.

EObjectBasedCalibrationGenerator.CalibrationObjectScaleX

This property is deprecated.

Returns the X axis scale of the calibration object. Deprecated: you should use @EObjectBasedCalibrationGenerator::GetCalibrationObjectSizeA@ instead.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrationObjectScaleX
  { get; }
```

EObjectBasedCalibrationGenerator.CalibrationObjectScaleY

This property is deprecated.

Returns the Y axis scale of the calibration object. Deprecated: you should use @EObjectBasedCalibrationGenerator::GetCalibrationObjectSizeB@ instead.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrationObjectScaleY
  { get; }
```

EObjectBasedCalibrationGenerator.CalibrationObjectScaleZ

This property is deprecated.

Returns the Z axis scale of the calibration object. Deprecated: you should use @EObjectBasedCalibrationGenerator::GetCalibrationObjectSizeC@ instead.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrationObjectScaleZ
  { get; }
```

EObjectBasedCalibrationGenerator.CalibrationObjectSizeA

Returns the 'A' size of the calibration object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrationObjectSizeA
  { get; }
```

EObjectBasedCalibrationGenerator.CalibrationObjectSizeB

Returns the 'B' size of the calibration object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrationObjectSizeB
  { get; }
```

EObjectBasedCalibrationGenerator.CalibrationObjectSizeC

Returns the 'C' size of the calibration object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrationObjectSizeC
  { get; }
```

EObjectBasedCalibrationGenerator.Compute

Computes an EObjectBasedCalibrationModel from the EDepthMap of the calibration object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationModel Compute(
 Euresys.Open_eVision.Easy3D.EDepthMap8 dm
 )

Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationModel Compute(
 Euresys.Open_eVision.Easy3D.EDepthMap16 dm
 )

Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationModel Compute(
 Euresys.Open_eVision.Easy3D.EDepthMap32f dm
 )
```

Parameters

dm

The input depth map of the calibration object.

EObjectBasedCalibrationGenerator.EObjectBasedCalibrationGenerator

Creates a EObjectBasedCalibrationGenerator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EObjectBasedCalibrationGenerator(
 )

void EObjectBasedCalibrationGenerator(
 Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationGenerator other
 )
```

Parameters

other

The other EObjectBasedCalibrationGenerator.

EObjectBasedCalibrationGenerator.GetCalibrationObjectType

Gets the EObjectBasedCalibrationType used for the computation of the EObjectBasedCalibrationModel.
The type of the object used for the calibration is E3DObjectBasedCalibrationType_NotDefined by default.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationType GetCalibrationObjectType(
 )
```

EObjectBasedCalibrationGenerator.Load

Loads the parameters used by the object based calibration generator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EObjectBasedCalibrationGenerator.NumCalibrationPasses

Sets/Gets the number of calibration passes.
Each passes will refine the calibration model but the computation will be longer.
The number of passes is 1 by default.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumCalibrationPasses
  { get; set; }
```

EObjectBasedCalibrationGenerator.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationGenerator operator=(
 Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationGenerator other
 )
```

Parameters

other

The other EObjectBasedCalibrationGenerator.

EObjectBasedCalibrationGenerator.PrecisionVsSpeedTradeOff

Sets/Gets the trade-off between precision and speed for the calibration.
The Precision vs speed trade-off mode from EObjectBasedCalibrationPrecisionVsSpeedTradeOff is EObjectBasedCalibrationPrecisionVsSpeedTradeOff_Balanced by default.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationPrecisionVsSpeedTradeOff
PrecisionVsSpeedTradeOff
  { get; set; }
```

EObjectBasedCalibrationGenerator.RangeX

Sets/Gets the 'X' axis range for the calibration object detection in the EDepthMap.
If max value is smaller than min value, then max will not be used, we use depth map width - 1 instead.
If min value is smaller than 0, then min will not be used, we use 0 instead.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EIntegerRange RangeX
```

```
{ get; set; }
```

EObjectBasedCalibrationGenerator.RangeY

Sets/Gets the 'Y' axis range for the calibration object detection in the depth map.
If max value is smaller than min value, then max will not be used, we use depth map height - 1 instead.
If min value is smaller than 0, then min will not be used, we use 0 instead.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EIntegerRange RangeY
  { get; set; }
```

EObjectBasedCalibrationGenerator.RangeZ

Sets/Gets the 'Z' axis range for the calibration object detection in the depth map.
if max value is smaller than min value, then max will not be used, we use the maximum float value instead.
if min value is smaller than 0, then min will not be used, we use 0 instead.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange RangeZ
  { get; set; }
```

EObjectBasedCalibrationGenerator.Save

Saves the parameters used by the object based calibration generator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EObjectBasedCalibrationGenerator.SetCalibrationObjectScale

This method is deprecated.

Sets the scale of your target calibration model compared to a reference model.
Refer to the user guide for the EObjectBasedCalibrationModel reference design.
Use that value to set the unit of the calibrated positions in the point cloud.
The scale will affect the world coordinates after conversion of the EDepthMap to EPointCloud.
For example, if "1 reference unit" is equal to "10 millimeters", set "10" as scale value.
Then applying the calibration will produce results in millimeters. Changing these values affect the calibration object sizes defined by EObjectBasedCalibrationGenerator::SetCalibrationObjectType. Deprecated: you should use @EObjectBasedCalibrationGenerator::SetCalibrationObjectType@ instead. Note that the scaleX/Y/Z and sizeA/B/C arguments aren't the same values.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetCalibrationObjectScale(
 float scale
 )

void SetCalibrationObjectScale(
 float scaleX,
 float scaleY,
 float scaleZ
 )
```

Parameters

scale

Sets the same scale on axis X, Y and Z relative to the calibration object reference size.

scaleX

Sets the scale on X axis relative to the calibration object reference size.

scaleY

Sets the scale on Y axis relative to the calibration object reference size.

scaleZ

Sets the scale on Z axis relative to the calibration object reference size.

EObjectBasedCalibrationGenerator.SetCalibrationObjectType

Sets the EObjectBasedCalibrationType used for the computation of the EObjectBasedCalibrationModel.
The type of the object used for the calibration is E3DObjectBasedCalibrationType_NotDefined by default.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetCalibrationObjectType(
 Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationType type
 )
void SetCalibrationObjectType(
 Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationType type,
 float sizeA,
 float sizeB,
 float sizeC
 )
```

Parameters

type
Sets the type of object calibration to detect in the EDepthMap.

sizeA
Sets the size 'A' of object calibration (1 by default).

sizeB
Sets the size 'B' of object calibration (1 by default).

sizeC
Sets the size 'C' of object calibration (1 by default).

Remarks

'sizeA', 'sizeB', and 'sizeC' values are in metric unit. The resulting point cloud positions after applying the calibration will follow the same metric unit. Refer to the Open eVision user guide, Easy3D calibration section, for the definition of 'A', 'B' and 'C' dimensions.

4.165. EObjectBasedCalibrationModel Class

EObjectBasedCalibrationModel is an Easy3D calibration model built from a scan of a reference object.

Base Class:ECalibrationModel

Namespace: Euresys.Open_eVision.Easy3D

Properties

CalibrationError	Returns the estimate of the calibration error (in metric units).

CalibrationRelativeError	Returns the estimate of the calibration error (in relative units).
Type	Returns the type of calibration model, see ECalibrationType.

Methods

EObjectBasedCalibrationModel	Creates an EObjectBasedCalibrationModel.
IsInitialized	Returns true if the model is initialized.
Load	Loads the model. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the model. The given ESerializer must have been created for writing.

EObjectBasedCalibrationModel.CalibrationError

Returns the estimate of the calibration error (in metric units).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float CalibrationError
  { get; }
```

EObjectBasedCalibrationModel.CalibrationRelativeError

Returns the estimate of the calibration error (in relative units).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float CalibrationRelativeError
  { get; }
```

EObjectBasedCalibrationModel.EObjectBasedCalibrationModel

Creates an EObjectBasedCalibrationModel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EObjectBasedCalibrationModel(
 )
void EObjectBasedCalibrationModel(
 Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationModel other
 )
```

Parameters

other

Another EObjectBasedCalibrationModel.

EObjectBasedCalibrationModel.IsInitialized

Returns true if the model is initialized.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsInitialized(
 )
```

EObjectBasedCalibrationModel.Load

Loads the model. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EObjectBasedCalibrationModel.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationModel operator=(
 Euresys.Open_eVision.Easy3D.EObjectBasedCalibrationModel other
 )
```

Parameters

other

Another EObjectBasedCalibrationModel.

EObjectBasedCalibrationModel.Save

Saves the model. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EObjectBasedCalibrationModel.Type

Returns the type of calibration model, see ECalibrationType.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.ECalibrationType Type
  { get; }
```

4.166. EObjectRunsIterator Class

Iterator to the runs of a coded element.

Remarks

This class is responsible for the sequential access to the individual runs of a coded element.

A run is defined as a maximal sequence of consecutive pixels on the same run, that all belong to the same coded element.

Namespace: Euresys.Open_eVision

Properties

EndX	Returns the abscissa (X-coordinate) of the rightmost pixel of the run the iterator is currently over.
IsDone	Tests whether all the runs have been spanned.
Length	Returns the lengths of the run the iterator is currently over.
StartX	Returns the abscissa (X-coordinate) of the leftmost pixel of the run the iterator is currently over.
Y	Returns the ordinate (Y-coordinate) of the run the iterator is currently over.

Methods

EObjectRunsIterator	Constructs an iterator to the runs of a coded element.
First	Rewinds to the first run of the coded element.
Next	Advance to the next run in the iterator.
operator=	Assignment operator.

EObjectRunsIterator.EndX

Returns the abscissa (X-coordinate) of the rightmost pixel of the run the iterator is currently over.

Namespace: Euresys.Open_eVision

[C#]

```
int EndX
  { get; }
```

Remarks

An exception is thrown if the iterator has reached its end. Use EObjectRunsIterator::IsDone to check this condition.

EObjectRunsIterator.EObjectRunsIterator

Constructs an iterator to the runs of a coded element.

Namespace: Euresys.Open_eVision

[C#]

```
void EObjectRunsIterator(
 Euresys.Open_eVision.ECodedElement codedElement
 )
void EObjectRunsIterator(
 Euresys.Open_eVision.EObjectRunsIterator other
 )
```

Parameters

codedElement

The coded element of interest, in the case the iterator is to be constructed from a given coded element.

other

The iterator to be copied, in the case of the copy constructor.

EObjectRunsIterator.First

Rewinds to the first run of the coded element.

Namespace: Euresys.Open_eVision

[C#]

```
void First(
 )
```

EObjectRunsIterator.IsDone

Tests whether all the runs have been spanned.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsDone
  { get; }
```

EObjectRunsIterator.Length

Returns the lengths of the run the iterator is currently over.

Namespace: Euresys.Open_eVision

[C#]

```
uint Length
  { get; }
```

Remarks

An exception is thrown if the iterator has reached its end. Use EObjectRunsIterator::IsDone to check this condition.

EObjectRunsIterator.Next

Advance to the next run in the iterator.

Namespace: Euresys.Open_eVision

[C#]

```
void Next(
 )
```

Remarks

An exception is thrown if the iterator has reached its end. Use EObjectRunsIterator::IsDone to check this condition.

EObjectRunsIterator.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObjectRunsIterator operator=(
 Euresys.Open_eVision.EObjectRunsIterator other
 )
```

Parameters

other

The iterator to be copied.

EObjectRunsIterator.StartX

Returns the abscissa (X-coordinate) of the leftmost pixel of the run the iterator is currently over.

Namespace: Euresys.Open_eVision

[C#]

```
int StartX
  { get; }
```

Remarks

An exception is thrown if the iterator has reached its end. Use EObjectRunsIterator::IsDone to check this condition.

EObjectRunsIterator.Y

Returns the ordinate (Y-coordinate) of the run the iterator is currently over.

Namespace: Euresys.Open_eVision

```
[C#]
int Y
  { get; }
```

Remarks

An exception is thrown if the iterator has reached its end. Use EObjectRunsIterator::IsDone to check this condition.

4.167. EObjectSelection Class

This container class handles the selection of a subset of coded elements taken from a coded image.

Remarks

This class provides methods to perform a selection of objects or holes and to retrieve the features of the coded elements in the collection.

Namespace: Euresys.Open_eVision

Properties

AttachedImage	Sets the attached image for computing the features that depend on an image.
ElementCount	Returns the number of coded elements selection.
FeretAngle	Angle of the Feret box (in the current angle units).

Methods

Add	Add a coded element to the selection.
AddHole	Adds a single hole of a coded image.
AddHoles	Adds all the holes contained in an object, in a layer or in a coded image.
AddHolesOfSelectedObjects	Adds the holes of all the objects that are currently selected.
AddLayer	Adds all the objects of a single layer in a coded image.
AddObject	Adds a single object of a layer in a coded image.
AddObjects	Adds all the objects of all the layers of a given coded image.

AddObjectsUsingFloatFeature	Selects the objects that fullfil a condition on a floating-point feature.
AddObjectsUsingIntegerFeature	Selects the objects that fullfil a condition on an integer feature.
AddObjectsUsingRectangle	Adds all the objects of a coded image whose location fullfil a criterion based on a rectangle.
AddObjectsUsingRegion	Adds all the objects of a coded image whose location fullfil a criterion based on an arbitrary region.
AddObjectsUsingUnsignedIntegerFeature	Selects the objects that fullfil a condition on an unsigned integer feature.
AddObjectUsingPosition	Adds the object of a coded image that lies at a particular location.
Clear	Remove all the coded elements that are contained in the selection.
ClearFeatureCache	Clears the internal cache for the computed features.
EObjectSelection	-
FeatureAverage	Computes the average of the values of the given feature across the selection.
FeatureDeviation	Computes the standard deviation of the values of the given feature across the selection.
FeatureVariance	Computes the variance of the values of the given feature across the selection.
FloatFeatureMaximum	Computes the maximum value of the given feature across the selection.
FloatFeatureMinimum	Computes the minimum value of the given feature across the selection.
GetElement	Index-based access to the coded elements of the selection.
GetFloatFeature	Returns the value of a floating-point feature for a selected coded element.
GetIndexOfElement	Retrieves the index of a given coded element in the selection.
GetIntegerFeature	Returns the value of an integer feature for a selected coded element.
GetUnsignedIntegerFeature	Returns the value of an unsigned integer feature for a selected coded element.
IntegerFeatureMaximum	Computes the maximum value of the given feature across the selection.
IntegerFeatureMinimum	Computes the minimum value of the given feature across the selection.
IsSelected	Tests whether a given coded element is present in the selection.
operator==	Equality operator for selection. For two object selection to be equal, they must have the exact same set of object coming from the same coded images.
Remove	Remove a coded element from the selection.
RemoveHole	Removes a single hole of a coded image.

RemoveHoles	Removes all the holes contained in an object, in a layer or in a coded image.
RemoveLayer	Removes all the objects of a single layer in a coded image.
RemoveObject	Removes a single object of a layer in a coded image.
RemoveObjectsUsingRectangle	Removes all the objects of a coded image whose location fullfil a criterion based on a rectangle.
RemoveObjectsUsingRegion	Removes all the objects of a coded image whose location fullfil a criterion based on an arbitrary region.
RemoveObjectUsingPosition	Removes the object of a coded image that lies at a particular location.
RemoveSelectedHoles	Remove all the holes that are currently present in the selection.
RemoveUsingFloatFeature	Removes the selected coded elements that fullfil a condition on a floating-point feature.
RemoveUsingIntegerFeature	Removes the selected coded elements that fullfil a condition on an unsigned integer feature.
RemoveUsingUnsignedIntegerFeature	Removes the selected coded elements that fullfil a condition on an unsigned integer feature.
RenderMask	Creates a Flexible Mask from the selection.
Sort	Sorts the selected coded elements according to the value of a feature.
ToRegion	Converts the object selection to a region.
UnsignedIntegerFeatureMaximum	Computes the maximum value of the given feature across the selection.
UnsignedIntegerFeatureMinimum	Computes the minimum value of the given feature across the selection.

EObjectSelection.Add

Add a coded element to the selection.

Namespace: Euresys.Open_eVision

```
[C#]
void Add(
 Euresys.Open_eVision.ECodedElement element
 )
```

Parameters

element

The coded element.

EObjectSelection.AddHole

Adds a single hole of a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void AddHole(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint objectIndex,
 uint holeIndex
 )
void AddHole(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex
 )
```

Parameters

codedImage

The coded image.

objectIndex

The index of the parent object in the layer.

holeIndex

The index of the hole in the parent object.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.AddHoles

Adds all the holes contained in an object, in a layer or in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void AddHoles(
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
```

```
void AddHoles(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex
 )

void AddHoles(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex
 )
```

Parameters

codedImage

The source coded image.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, all the layers are taken into consideration.

objectIndex

The index of the parent object. If this parameter is left unspecified, all the objects are taken into consideration.

EObjectSelection.AddHolesOfSelectedObjects

Adds the holes of all the objects that are currently selected.

Namespace: Euresys.Open_eVision

[C#]

```
void AddHolesOfSelectedObjects(
 )
```

EObjectSelection.AddLayer

Adds all the objects of a single layer in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void AddLayer(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex
 )

void AddLayer(
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
```

Parameters

codedImage

The coded image.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.AddObject

Adds a single object of a layer in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void AddObject(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint objectIndex
 )

void AddObject(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex
 )
```

Parameters

codedImage

The coded image.

objectIndex

The index of the object in the layer.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.AddObjects

Adds all the objects of all the layers of a given coded image.

Namespace: Euresys.Open_eVision

```
[C#]
void AddObjects(
 Euresys.Open_eVision.ECodedImage2 image
 )
```

Parameters

image

The coded image.

EObjectSelection.AddObjectsUsingFloatFeature

Selects the objects that fullfil a condition on a floating-point feature.

Namespace: Euresys.Open_eVision

```
[C#]
void AddObjectsUsingFloatFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.EFeature feature,
 float threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
void AddObjectsUsingFloatFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.EFeature feature,
 float lowBound,
 float highBound,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
void AddObjectsUsingFloatFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.EFeature feature,
 float threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
void AddObjectsUsingFloatFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.EFeature feature,
 float lowBound,
 float highBound,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

Parameters

codedImage

The source coded image.

layerIndex

The index of the layer of interest. If left unspecified, all the layers are taken into consideration.

feature

The feature that serves as a filter.

threshold

The single threshold on the feature.

mode

Specifies the way the threshold is interpreted.

lowBound

The low bound of the range on the feature.

highBound

The high bound of the range on the feature.

Remarks

Most features are floating-point. These methods thus tend to be the most widely used.

EObjectSelection.AddObjectsUsingIntegerFeature

Selects the objects that fullfil a condition on an integer feature.

Namespace: Euresys.Open_eVision

[C#]

```
void AddObjectsUsingIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.EFeature feature,
 int threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )

void AddObjectsUsingIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.EFeature feature,
 int lowBound,
 int highBound,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

```
void AddObjectsUsingIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.EFeature feature,
 int threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
void AddObjectsUsingIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.EFeature feature,
 int lowBound,
 int highBound,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

Parameters

codedImage

The source coded image.

layerIndex

The index of the layer of interest. If left unspecified, all the layers are taken into consideration.

feature

The feature that serves as a filter.

threshold

The single threshold on the feature.

mode

Specifies the way the threshold is interpreted.

lowBound

The low bound of the range on the feature.

highBound

The high bound of the range on the feature.

EObjectSelection.AddObjectsUsingRectangle

Adds all the objects of a coded image whose location fullfil a criterion based on a rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void AddObjectsUsingRectangle(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 int x,
 int y,
 uint width,
 uint height,
 Euresys.Open_eVision.ERectangleMode mode
 )
```

```
void AddObjectsUsingRectangle(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 int x,
 int y,
 uint width,
 uint height,
 Euresys.Open_eVision.ERectangleMode mode
 )
```

Parameters

codedImage
The source coded image.

x
The X-coordinate of the top-left corner of the selection rectangle.

y
The Y-coordinate of the top-left corner of the selection rectangle.

width
The width of the selection rectangle.

height
The height of the selection rectangle.

mode
The comparison mode with respect to the selection rectangle.

layerIndex
If specified, only the specified layer is taken into consideration.

EObjectSelection.AddObjectsUsingRegion

Adds all the objects of a coded image whose location fullfil a criterion based on an arbitrary region.

Namespace: Euresys.Open_eVision

[C#]

```
void AddObjectsUsingRegion(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ERectangleMode mode
 )
void AddObjectsUsingRegion(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ERectangleMode mode
 )
```

Parameters

codedImage

The source coded image.

layerIndex

If specified, only the specified layer is taken into consideration.

region

The region defining the geometric domain.

mode

The comparison mode with respect to the region.

EObjectSelection.AddObjectsUsingUnsignedIntegerFeature

Selects the objects that fullfil a condition on an unsigned integer feature.

Namespace: Euresys.Open_eVision

[C#]

```
void AddObjectsUsingUnsignedIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.EFeature feature,
 uint threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
void AddObjectsUsingUnsignedIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.EFeature feature,
 uint threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
void AddObjectsUsingUnsignedIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.EFeature feature,
 uint lowBound,
 uint highBound,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
void AddObjectsUsingUnsignedIntegerFeature(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.EFeature feature,
 uint lowBound,
 uint highBound,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

Parameters

codedImage

The source coded image.

layerIndex

The index of the layer of interest. If left unspecified, all the layers are taken into consideration.

feature

The feature that serves as a filter.

threshold

The single threshold on the feature.

mode

Specifies the way the threshold is interpreted.

lowBound

The low bound of the range on the feature.

highBound

The high bound of the range on the feature.

EObjectSelection.AddObjectUsingPosition

Adds the object of a coded image that lies at a particular location.

Namespace: Euresys.Open_eVision

```
[C#]
void AddObjectUsingPosition(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 int x,
 int y
 )
```

Parameters

codedImage

The source coded image.

x

The X-coordinate of the object.

y

The Y-coordinate of the object.

Remarks

If no object lies at the specified coordinate, the selection is not changed.

EObjectSelection.AttachedImage

Sets the attached image for computing the features that depend on an image.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW8 AttachedImage
  { get; set; }
```

Remarks

An image must be attached before dealing with the following features: PixelMin, PixelMax, WeightedGravityCenterX, WeightedGravityCenterY, PixelGrayAverage, PixelGrayVariance, PixelGrayDeviation.

EObjectSelection.Clear

Remove all the coded elements that are contained in the selection.

Namespace: Euresys.Open_eVision

[C#]

```
void Clear(
 )
```

EObjectSelection.ClearFeatureCache

Clears the internal cache for the computed features.

Namespace: Euresys.Open_eVision

[C#]

```
void ClearFeatureCache(
 )
```

Remarks

This is useful to reduce memory consumption.

EObjectSelection.ElementCount

Returns the number of coded elements selection.

Namespace: Euresys.Open_eVision

[C#]

```
uint ElementCount
  { get; }
```

EObjectSelection.EObjectSelection

-

Namespace: Euresys.Open_eVision

```
[C#]
void EObjectSelection(
 )
```

EObjectSelection.FeatureAverage

Computes the average of the values of the given feature across the selection.

Namespace: Euresys.Open_eVision

```
[C#]
float FeatureAverage(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

EObjectSelection.FeatureDeviation

Computes the standard deviation of the values of the given feature across the selection.

Namespace: Euresys.Open_eVision

```
[C#]
float FeatureDeviation(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

EObjectSelection.FeatureVariance

Computes the variance of the values of the given feature across the selection.

Namespace: Euresys.Open_eVision

[C#]

```
float FeatureVariance(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

EObjectSelection.FeretAngle

Angle of the Feret box (in the current angle units).

Namespace: Euresys.Open_eVision

[C#]

```
float FeretAngle
  { get; set; }
```

Remarks

A Feret angle must be set for the following features: FeretBoxCenterX, FeretBoxCenterY, FeretBoxWidth, FeretBoxHeight.

EObjectSelection.FloatFeatureMaximum

Computes the maximum value of the given feature across the selection.

Namespace: Euresys.Open_eVision

[C#]

```
float FloatFeatureMaximum(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

Remarks

Most features are floating-point. This method thus tends to be the most widely used.

EObjectSelection.FloatFeatureMinimum

Computes the minimum value of the given feature across the selection.

Namespace: Euresys.Open_eVision

[C#]

```
float FloatFeatureMinimum(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

Remarks

Most features are floating-point. This method thus tends to be the most widely used.

EObjectSelection.GetElement

Index-based access to the coded elements of the selection.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ECodedElement GetElement(
 uint index
 )

Euresys.Open_eVision.ECodedElement GetElement(
 uint index
 )
```

Parameters

index

The index of the coded element of interest.

EObjectSelection.GetFloatFeature

Returns the value of a floating-point feature for a selected coded element.

Namespace: Euresys.Open_eVision

[C#]

```
float GetFloatFeature(
 uint index,
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

index

The index of the selected coded element.

feature

The feature of interest.

Remarks

Most features are floating-point. This method thus tends to be the most widely used.

EObjectSelection.GetIndexOfElement

Retrieves the index of a given coded element in the selection.

Namespace: Euresys.Open_eVision

```
[C#]
uint GetIndexOfElement(
 Euresys.Open_eVision.ECodedElement element
 )
```

Parameters

element

The coded element of interest.

Remarks

An exception is thrown if the coded element is not present in the selection.

EObjectSelection.GetIntegerFeature

Returns the value of an integer feature for a selected coded element.

Namespace: Euresys.Open_eVision

```
[C#]
int GetIntegerFeature(
 uint index,
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

index

The index of the selected coded element.

feature

The feature of interest.

EObjectSelection.GetUnsignedIntegerFeature

Returns the value of an unsigned integer feature for a selected coded element.

Namespace: Euresys.Open_eVision

```
[C#]
uint GetUnsignedIntegerFeature(
 uint index,
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

index

The index of the selected coded element.

feature

The feature of interest.

EObjectSelection.IntegerFeatureMaximum

Computes the maximum value of the given feature across the selection.

Namespace: Euresys.Open_eVision

```
[C#]
int IntegerFeatureMaximum(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

EObjectSelection.IntegerFeatureMinimum

Computes the minimum value of the given feature across the selection.

Namespace: Euresys.Open_eVision

```
[C#]
int IntegerFeatureMinimum(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

EObjectSelection.IsSelected

Tests whether a given coded element is present in the selection.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsSelected(
 Euresys.Open_eVision.ECodedElement element
 )

bool IsSelected(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint objectIndex
 )

bool IsSelected(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex
 )

bool IsSelected(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex
 )
```

Parameters

element

The coded element.

codedImage

The coded image.

objectIndex

The index of the object in the layer of interest.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

holeIndex

If specified, the index of the hole in the object. If unspecified, one tests the presence of the object.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.operator==

Equality operator for selection. For two object selection to be equal, they must have the exact same set of object coming from the same coded images.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EObjectSelection other
 )
```

Parameters

other

Object selection to compare to.

EObjectSelection.Remove

Remove a coded element from the selection.

Namespace: Euresys.Open_eVision

```
[C#]
void Remove(
 Euresys.Open_eVision.ECodedElement element
 )
```

Parameters

element

The coded element.

EObjectSelection.RemoveHole

Removes a single hole of a coded image.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveHole(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint objectIndex,
 uint holeIndex
 )
```

```
void RemoveHole(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex,
 uint holeIndex
 )
```

Parameters

codedImage

The coded image.

objectIndex

The index of the parent object in the layer.

holeIndex

The index of the hole in the parent object.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.RemoveHoles

Removes all the holes contained in an object, in a layer or in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveHoles(
 Euresys.Open_eVision.ECodedImage2 codedImage
 )

void RemoveHoles(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex
 )

void RemoveHoles(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex
 )
```

Parameters

codedImage

The source coded image.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, all the layers are taken into consideration.

objectIndex

The index of the parent object. If this parameter is left unspecified, all the objects are taken into consideration.

EObjectSelection.RemoveLayer

Removes all the objects of a single layer in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveLayer(
 Euresys.Open_eVision.ECodedImage2 codedImage
 )
void RemoveLayer(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex
 )
```

Parameters

codedImage

The coded image.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.RemoveObject

Removes a single object of a layer in a coded image.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveObject(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint objectIndex
 )
```

```
void RemoveObject(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 uint objectIndex
 )
```

Parameters

codedImage

The coded image.

objectIndex

The index of the object in the layer.

layerIndex

The index of the layer of interest. If this parameter is left unspecified, the default layer will be taken into consideration.

Remarks

This methods throws an exception if no layer index is specified and if, simultaneously, the coded image contains several layers. Indeed, in such a case, no default layer exists.

EObjectSelection.RemoveObjectsUsingRectangle

Removes all the objects of a coded image whose location fullfil a criterion based on a rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveObjectsUsingRectangle(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 int x,
 int y,
 uint width,
 uint height,
 Euresys.Open_eVision.ERectangleMode mode
 )

void RemoveObjectsUsingRectangle(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 int x,
 int y,
 uint width,
 uint height,
 Euresys.Open_eVision.ERectangleMode mode
 )
```

Parameters

codedImage
The source coded image.

x
The X-coordinate of the top-left corner of the selection rectangle.

y
The Y-coordinate of the top-left corner of the selection rectangle.

width
The width of the selection rectangle.

height
The height of the selection rectangle.

mode
The comparison mode with respect to the selection rectangle.

layerIndex
If specified, only the specified layer is taken into consideration.

EObjectSelection.RemoveObjectsUsingRegion

Removes all the objects of a coded image whose location fullfil a criterion based on an arbitrary region.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveObjectsUsingRegion(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 uint layerIndex,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ERectangleMode mode
 )
void RemoveObjectsUsingRegion(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.ERectangleMode mode
 )
```

Parameters

codedImage
The source coded image.

layerIndex
If specified, only the specified layer is taken into consideration.

region
The region defining the geometric domain.

mode
The comparison mode with respect to the region.

EObjectSelection.RemoveObjectUsingPosition

Removes the object of a coded image that lies at a particular location.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveObjectUsingPosition(
 Euresys.Open_eVision.ECodedImage2 codedImage,
 int x,
 int y
 )
```

Parameters

codedImage

The source coded image.

x

The X-coordinate of the object.

y

The Y-coordinate of the object.

Remarks

If no object lies at the specified coordinate, the selection is not changed.

EObjectSelection.RemoveSelectedHoles

Remove all the holes that are currently present in the selection.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveSelectedHoles(
 )
```

EObjectSelection.RemoveUsingFloatFeature

Removes the selected coded elements that fullfil a condition on a floating-point feature.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveUsingFloatFeature(
 Euresys.Open_eVision.EFeature feature,
 float threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
```

```
void RemoveUsingFloatFeature(
 Euresys.Open_eVision.EFeature feature,
 float low,
 float high,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

Parameters

feature
The feature that serves as a filter.

threshold
The single threshold on the feature.

mode
Specifies the way the threshold is interpreted.

low
The low bound of the range on the feature.

high
The high bound of the range on the feature.

Remarks

Most features are floating-point. These methods thus tend to be the most widely used.

EObjectSelection.RemoveUsingIntegerFeature

Removes the selected coded elements that fullfil a condition on an unsigned integer feature.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveUsingIntegerFeature(
 Euresys.Open_eVision.EFeature feature,
 int threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )

void RemoveUsingIntegerFeature(
 Euresys.Open_eVision.EFeature feature,
 int low,
 int high,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

Parameters

feature
The feature that serves as a filter.

threshold
The single threshold on the feature.

mode
Specifies the way the threshold is interpreted.

low
The low bound of the range on the feature.

high
The high bound of the range on the feature.

EObjectSelection.RemoveUsingUnsignedIntegerFeature

Removes the selected coded elements that fullfil a condition on an unsigned integer feature.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveUsingUnsignedIntegerFeature(
 Euresys.Open_eVision.EFeature feature,
 uint threshold,
 Euresys.Open_eVision.ESingleThresholdMode mode
 )
void RemoveUsingUnsignedIntegerFeature(
 Euresys.Open_eVision.EFeature feature,
 uint low,
 uint high,
 Euresys.Open_eVision.EDoubleThresholdMode mode
 )
```

Parameters

feature
The feature that serves as a filter.

threshold
The single threshold on the feature.

mode
Specifies the way the threshold is interpreted.

low
The low bound of the range on the feature.

high
The high bound of the range on the feature.

EObjectSelection.RenderMask

Creates a Flexible Mask from the selection.

Namespace: Euresys.Open_eVision

```
[C#]
void RenderMask(
 Euresys.Open_eVision.EROIBW8 result,
 int offsetX,
 int offsetY
 )
void RenderMask(
 Euresys.Open_eVision.EROIBW8 result
 )
```

Parameters

result

The image in which the generated mask will be stored.

offsetX

The X-offset that must be applied to bring the zero X-coordinate in the coded image on the first column of the result image (defaults to zero).

offsetY

The Y-offset that must be applied to bring the zero Y-coordinate in the coded image on the first row of the result image (defaults to zero).

Remarks

The size of the result image will not be changed: It must be properly sized beforehand.

This method generates an exception if several layers are encoded, in which case no default layer exists.

EObjectSelection.Sort

Sorts the selected coded elements according to the value of a feature.

Namespace: Euresys.Open_eVision

```
[C#]
void Sort(
 Euresys.Open_eVision.EFeature feature
 )
void Sort(
 Euresys.Open_eVision.EFeature feature,
 Euresys.Open_eVision.ESortDirection direction
 )
```

Parameters

feature

The feature to sort with.

direction

The sorting direction. By default, the features are sorted by increasing values.

EObjectSelection.ToRegion

Converts the object selection to a region.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion ToRegion(
 )
```

EObjectSelection.UnsignedIntegerFeatureMaximum

Computes the maximum value of the given feature across the selection.

Namespace: Euresys.Open_eVision

```
[C#]
uint UnsignedIntegerFeatureMaximum(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

EObjectSelection.UnsignedIntegerFeatureMinimum

Computes the minimum value of the given feature across the selection.

Namespace: Euresys.Open_eVision

```
[C#]
uint UnsignedIntegerFeatureMinimum(
 Euresys.Open_eVision.EFeature feature
 )
```

Parameters

feature

The feature of interest.

4.168. EObjectTemplateMatcher Class

The EObjectTemplateMatcher class is a tool designed to align and match the output of EasyObject to a reference template.

Namespace: Euresys.Open_eVision

Properties

EnableAlignment	Enable an optional preliminary global alignement (rigid transformation only: translation and rotation). Choose to enable alignment only if the selection is not aligned with the template.
MaximumDistance	Defines the absolute maximum distance for a match to be valid. That value is used during the closest object search. By default, infinite distance is used.
NumberOfPairedObjects	Return the number of paired objects
SelectionIndexes	For each object in the **TEMPLATE** return the paired index in the SELECTION. if the object has no match, the value -1 is used.
TemplateIndexes	For each object in the **SELECTION** return the paired index in the TEMPLATE. If the object has no match, the value -1 is used.

Methods

BuildTemplate	Set the reference template from a previous EasyObject coded image, an object selection or a list of known positions.
EObjectTemplateMatcher	Creates an EObjectTemplateMatcher object.
GetUnpairedObjects	Return lists of object indexes that appear only in template or only in selection.
Load	Load the EObjectTemplateMatcher configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Save the EObjectTemplateMatcher configuration. The given ESerializer must have been created for writing.

SortPositions	Align and match the given position array with the reference template. The shortest distance between the positions is used to pair the given positions with the template's positions. After the execution of this function, the template indexes corresponding to the position array are returned by method EObjectTemplateMatcher. The position indexes for template's positions are returned by method EObjectTemplateMatcher. Indexes of positions that appears only in template or only in the given array are returned by method EObjectTemplateMatcher::GetUnpairedObjects. The complexity is O(n) where n is the number of elements in the given array.
SortSelection	Align and match the given selection with the reference template. The shortest distance between object's centers is used to pair the objects in the selection with the objects in the template. After the execution of this function, the template indexes corresponding to selection objects are returned by method EObjectTemplateMatcher. The selection indexes for template objects are returned by method EObjectTemplateMatcher. Indexes of objects that appears only in template or only in selection are returned by method EObjectTemplateMatcher::GetUnpairedObjects. The complexity is O(n) where n is the number of objects in selection.

EObjectTemplateMatcher.BuildTemplate

Set the reference template from a previous EasyObject coded image, an object selection or a list of known positions.

Namespace: Euresys.Open_eVision

[C#]

```
void BuildTemplate(
 Euresys.Open_eVision.EObjectSelection selection
 )

void BuildTemplate(
 Euresys.Open_eVision.ECodedImage2 objects
 )

void BuildTemplate(
 Euresys.Open_eVision.EPoint[] positions
 )
```

Parameters

selection

The object selection to be used as template.

objects

The coded image to be used as template.

positions

The list of positions to be used as template.

EObjectTemplateMatcher.EnableAlignment

Enable an optional preliminary global alignement (rigid transformation only: translation and rotation). Choose to enable alignment only if the selection is not aligned with the template.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableAlignment
  { get; set; }
```

EObjectTemplateMatcher.EObjectTemplateMatcher

Creates an EObjectTemplateMatcher object.

Namespace: Euresys.Open_eVision

[C#]

```
void EObjectTemplateMatcher(
 )

void EObjectTemplateMatcher(
 Euresys.Open_eVision.EObjectTemplateMatcher other
 )
```

Parameters

other

Reference to the EObjectTemplateMatcher used for the initialization.

EObjectTemplateMatcher.GetUnpairedObjects

Return lists of object indexes that appear only in template or only in selection.

Namespace: Euresys.Open_eVision

[C#]

```
void GetUnpairedObjects(
 ref int[] onlyInTemplate,
 ref int[] onlyInSelection
 )
```

Parameters

onlyInTemplate

The list of object indexes that appear only in the template.

onlyInSelection

The list of object indexes that appear only in the selection.

EObjectTemplateMatcher.Load

Load the EObjectTemplateMatcher configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EObjectTemplateMatcher.MaximumDistance

Defines the absolute maximum distance for a match to be valid. That value is used during the closest object search. By default, infinite distance is used.

Namespace: Euresys.Open_eVision

[C#]

```
float MaximumDistance
  { get; set; }
```

EObjectTemplateMatcher.NumberOfPairedObjects

Return the number of paired objects

Namespace: Euresys.Open_eVision

[C#]

```
int NumberOfPairedObjects
  { get; }
```

EObjectTemplateMatcher.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EObjectTemplateMatcher operator=(
 Euresys.Open_eVision.EObjectTemplateMatcher other
 )
```

Parameters

other

The EObjectTemplateMatcher object that should be copied.

EObjectTemplateMatcher.Save

Save the EObjectTemplateMatcher configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EObjectTemplateMatcher.SelectionIndexes

For each object in the **TEMPLATE** return the paired index in the SELECTION. if the object has no match, the value -1 is used.

Namespace: Euresys.Open_eVision

[C#]

```
int[] SelectionIndexes
  { get; }
```

EObjectTemplateMatcher.SortPositions

Align and match the given position array with the reference template.
The shortest distance between the positions is used to pair the given positions with the template's positions. After the execution of this function, the template indexes corresponding to the position array are returned by method EObjectTemplateMatcher.
The position indexes for template's positions are returned by method EObjectTemplateMatcher.
Indexes of positions that appears only in template or only in the given array are returned by method EObjectTemplateMatcher::GetUnpairedObjects.
The complexity is O(n) where n is the number of elements in the given array.

Namespace: Euresys.Open_eVision

[C#]

```
void SortPositions(
 Euresys.Open_eVision.EPoint[] positions
 )
```

Parameters

positions

The array of positions to be compared with the template.

EObjectTemplateMatcher.SortSelection

Align and match the given selection with the reference template.
The shortest distance between object's centers is used to pair the objects in the selection with the objects in the template. After the execution of this function, the template indexes corresponding to selection objects are returned by method EObjectTemplateMatcher.
The selection indexes for template objects are returned by method EObjectTemplateMatcher.
Indexes of objects that appears only in template or only in selection are returned by method EObjectTemplateMatcher::GetUnpairedObjects.
The complexity is O(n) where n is the number of objects in selection.

Namespace: Euresys.Open_eVision

[C#]

```
void SortSelection(
 Euresys.Open_eVision.EObjectSelection selection
 )
```

Parameters

selection

The object selection to be compared. The selection is unchanged.

EObjectTemplateMatcher.TemplateIndexes

For each object in the **SELECTION** return the paired index in the TEMPLATE. If the object has no match, the value -1 is used.

Namespace: Euresys.Open_eVision

```
[C#]
int[] TemplateIndexes
  { get; }
```

4.169. EOCR Class

Manages a complete context for the font-dependent printed character reader implemented in EasyOCR.

Namespace: Euresys.Open_eVision

Properties

CharSpacing	Spacing that separates characters.
CompareAspectRatio	Flag indicating whether the character aspect ratio is used to compute the recognition score.
CutLargeChars	Flag indicating whether the large chars cutting mode is used.
LineSpacingMode	Line spacing mode to sort the character boxes into lines. Default mode is ELineSpacingMode.
MatchingMode	Matching mode to use to compare characters to the template.
MaxCharHeight	Maximum character height.
MaxCharWidth	Maximum character width.
MinCharHeight	Minimum character height.
MinCharWidth	Minimum character width.
NoiseArea	Noise area.
NumChars	Number of recognized characters.
NumPatterns	Number of patterns in the current font.
PatternHeight	Current pattern height, as set at the last EOCR::NewFont or EOCR::Load operation.
PatternWidth	Current pattern width, as set at the last EOCR::NewFont or EOCR::Load operation.
RelativeSpacing	Relative spacing value.
RelativeThreshold	Relative threshold used for image segmentation.

RemoveBorder	Flag indicating whether all blobs touching the ROI edges are automatically discarded.
RemoveNarrowOrFlat	Flag indicating whether the characters are discarded when either dimension falls below the minimum value
SegmentationMode	Segmentation mode.
ShiftingMode	Shifting mode to use to compare characters to the template.
ShiftXTolerance	Horizontal translation tolerance around the nominal position when the character positions are explicitly specified.
ShiftYTolerance	Vertical translation tolerance around the nominal position when the character positions are explicitly specified.
TextColor	Text color.
Threshold	Threshold mode used for image segmentation.
TrueThreshold	Absolute threshold level when using a single threshold.

Methods

AddChar	Add a character coordinates to the list.
AddPatternFromImage	Adds a new pattern to the font.
BuildObjects	Segments the source image, i.e. detects and labels the objects.
CharGetDstX	Returns the abscissa of the lower right corner of a recognized character.
CharGetDstY	Returns the ordinate of the lower right corner of a recognized character.
CharGetHeight	Returns the height of a recognized character.
CharGetOrgX	Returns the abscissa of the upper left corner of a recognized character.
CharGetOrgY	Returns the ordinate of the upper left corner of a recognized character.
CharGetTotalDstX	Returns the abscissa of the lower right corner of a recognized character.
CharGetTotalDstY	Returns the ordinate of the lower right corner of a recognized character.
CharGetTotalOrgX	Returns the abscissa of the upper left corner of a recognized character.
CharGetTotalOrgY	Returns the ordinate of the upper left corner of a recognized character.
CharGetWidth	Returns the width of a recognized character.
DrawChar	Draws the bounding box of a given character.
DrawChars	Draws the bounding boxes of all characters in the image.
DrawCharsWithCurrentPen	Draws the bounding boxes of all characters in the image.
DrawCharWithCurrentPen	Draws the bounding box of a given character.
DrawObjects	-

EmptyChars	Empties the list of known characters.
EOCR	Constructs an OCR context.
FindAllChars	Locates the characters by filtering the objects according to their size, and grouping them if the segmentation mode is set to RepasteObjects.
GetConfidenceRatio	Returns the degree of confidence in the recognized character.
GetFirstCharCode	Returns the code of the pattern that matches at best a recognized character.
GetFirstCharDistance	Computes the degree of similarity between the best matching pattern and a recognized character.
GetPatternBitmap	Returns a pointer to an image holding the pattern of the given index. This image should not be modified.
GetPatternClass	Returns the class of a given pattern in the current font.
GetPatternCode	Returns the character code of a given pattern in the current font.
GetSecondCharCode	Returns the code of the pattern that matches at second best a recognized character.
GetSecondCharDistance	Computes the degree of similarity between the second best matching pattern and a recognized character.
HitChar	Returns true if the cursor is placed over the character specified by charIndex.
HitChars	Returns true if the cursor is placed over a character and sets the charIndex accordingly.
LearnPattern	Adds a new pattern to the font.
LearnPatterns	Adds all the patterns from the source image to the font.
Load	Loads the EOCR object configuration.
MatchChar	Reads a single character, i.e. finds the best match between the patterns in the font and the given character.
NewFont	Empties the contents of the font and sets the size of the pattern array to be used from then on.
operator=	Copies all the data from another EOCR object into the current EOCR object
ReadText	Reads one or more rows of characters, i.e. finds the best match between the patterns in the font and the segmented characters.
ReadTextWide	DEPRECATED: Use the EOCR::ReadText method instead as it performs similarly to this method, except it returns UTF-8 instead of wide characters. Reads one or more rows of characters, i.e. finds the best match between the patterns in the font and the segmented characters.
Recognize	Achieves all processing phases (blob analysis, character segmentation and pattern recognition) in a single operation.
RecognizeWide	DEPRECATED: use the EOCR::Recognize method instead as it performs similarly to this method, except it returns UTF-8 instead of wide characters. Achieves all processing phases (blob analysis, character segmentation and pattern recognition) in a single operation.

RemovePattern	Removes a given pattern from the current font.
Save	Saves the EOCR object configuration.
SetPatternClass	Sets the class of a given pattern in the current font.
SetPatternCode	Sets the character code of a given pattern in the current font.

EOCR.AddChar

Add a character coordinates to the list.

Namespace: Euresys.Open_eVision

```
[C#]
void AddChar(
 int originX,
 int originY,
 int endX,
 int endY
 )
```

Parameters

originX

Abscissa of the upper left corner of the bounding box of the character.

originY

Ordinate of the upper left corner of the bounding box of the character.

endX

Abscissa of the bottom right corner of the bounding box of the character.

endY

Ordinate of the bottom right corner of the bounding box of the character.

Remarks

It is to use when you know the exact position of the characters to be recognized, to bypass the segmentation step, for efficiency or reliability purposes. To use this feature, simply specify the character positions by successive calls to AddChar. When this is done, the remainder of the OCR processing steps can take place. To empty the list of known characters, call EOCR::EmptyChars.

EOCR.AddPatternFromImage

Adds a new pattern to the font.

Namespace: Euresys.Open_eVision

```
[C#]
void AddPatternFromImage(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int originX,
 int originY,
 int width,
 int height,
 int code,
 uint classes
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

originX
Abscissa of the upper left corner of the bounding box of the pattern.

originY
Ordinate of the upper left corner of the bounding box of the pattern.

width
Width of the bounding box of the pattern.

height
Height of the bounding box of the pattern.

code
Character code of the pattern.

classes
Class of the pattern, as defined by EOCRClass.

Remarks

The pattern is extracted from an image by specifying a bounding rectangle.

EOCR.BuildObjects

Segments the source image, i.e. detects and labels the objects.

Namespace: Euresys.Open_eVision

```
[C#]
void BuildObjects(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

Remarks

An object is a connected set of pixels above or below Threshold (according to TextColor).

EOCR.CharGetDstX

Returns the abscissa of the lower right corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetDstX(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.CharGetDstY

Returns the ordinate of the lower right corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetDstY(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.CharGetHeight

Returns the height of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetHeight(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.CharGetOrgX

Returns the abscissa of the upper left corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetOrgX(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.CharGetOrgY

Returns the ordinate of the upper left corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetOrgY(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.CharGetTotalDstX

Returns the abscissa of the lower right corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetTotalDstX(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

The coordinates are computed with respect to the parent image rather than the ROI.

EOCR.CharGetTotalDstY

Returns the ordinate of the lower right corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetTotalDstY(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

The coordinates are computed with respect to the parent image rather than the ROI.

EOCR.CharGetTotalOrgX

Returns the abscissa of the upper left corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetTotalOrgX(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

The coordinates are computed with respect to the parent image rather than the ROI.

EOCR.CharGetTotalOrgY

Returns the ordinate of the upper left corner of a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int CharGetTotalOrgY(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

The coordinates are computed with respect to the parent image rather than the ROI.

EOCR.CharGetWidth

Returns the width of a recognized character.

Namespace: Euresys.Open_eVision

[C#]

```
int CharGetWidth(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.CharSpacing

Spacing that separates characters.

Namespace: Euresys.Open_eVision

[C#]

```
int CharSpacing
  { get; set; }
```

Remarks

When two objects are separated by a vertical gap larger or equal than the spacing, they are considered to belong to distinct characters. Note that two objects can still be separated if their merging will be wider than EOCR::MaxCharWidth. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.CompareAspectRatio

Flag indicating whether the character aspect ratio is used to compute the recognition score.

Namespace: Euresys.Open_eVision

[C#]

```
bool CompareAspectRatio
```

```
{ get; set; }
```

Remarks

When true, the character aspect ratio is used to compute the recognition score.

EOCR.CutLargeChars

Flag indicating whether the large chars cutting mode is used.

Namespace: Euresys.Open_eVision

[C#]

```
bool CutLargeChars
  { get; set; }
```

Remarks

If true, candidate characters larger than MaxWidth are split into as many parts as required. If false, large characters are discarded. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.DrawChar

Draws the bounding box of a given character.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawChar(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 uint charIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawChar(
 IntPtr graphicContext,
 uint charIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawChar(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 uint charIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

charIndex

Character index, in range 0..NumChars-1.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR.DrawChars

Draws the bounding boxes of all characters in the image.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawChars(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawChars(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawChars(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all characters (to vary the colors, draw the objects separately using the EOCR::DrawChar method instead). Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR.DrawCharsWithCurrentPen

This method is deprecated.

Draws the bounding boxes of all characters in the image.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawCharsWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used for all characters (to vary the colors, draw the objects separately using the EOCR::DrawChar method instead). Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR.DrawCharWithCurrentPen

This method is deprecated.

Draws the bounding box of a given character.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawCharWithCurrentPen(
 IntPtr graphicContext,
 uint charIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

charIndex

Character index, in range 0..NumChars-1.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Drawing is done in the device context associated to the desired window. The current pen is used. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR.DrawObjects

-

Namespace: Euresys.Open_eVision

[C#]

```
void DrawObjects(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ESelectionFlag eSelection,
 float f32ZoomX,
 float f32ZoomY,
 float f32PanX,
 float f32PanY
 )
```

Parameters

graphicContext

-

eSelection

-

f32ZoomX

-

f32ZoomY

-

f32PanX

-

f32PanY

-

EOCR.EmptyChars

Empties the list of known characters.

Namespace: Euresys.Open_eVision

```
[C#]
void EmptyChars(
 )
```

Remarks

It is to use when you know the exact position of the characters to be recognized. See member EOCR::AddChar.

EOCR.EOCR

Constructs an OCR context.

Namespace: Euresys.Open_eVision

```
[C#]
void EOCR(
 )
void EOCR(
 Euresys.Open_eVision.EOCR other
 )
```

Parameters

other

Another EOCR object to be copied in the new EOCR object.

Remarks

By default, the Threshold property is set to 128.

EOCR.FindAllChars

Locates the characters by filtering the objects according to their size, and grouping them if the segmentation mode is set to RepasteObjects.

Namespace: Euresys.Open_eVision

[C#]

```
void FindAllChars(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
```

Parameters

sourceImage

Pointer to the source image/ROI. This parameter is not used and kept only for compatibility purposes.

Remarks

The characters are sorted from left to right. This operation must be performed after a call to EOCR::BuildObjects and before a call to EOCR::ReadText.

EOCR.GetConfidenceRatio

Returns the degree of confidence in the recognized character.

Namespace: Euresys.Open_eVision

[C#]

```
float GetConfidenceRatio(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

A value of 100 % means there is no difference between the recognized character and the best matching pattern. A value of 0 % means there is no way to distinguish between the best and second best matching pattern. The computation of the confidence ratio is based on the first and second characters distance parameters (see EOCR::GetFirstCharDistance and EOCR::GetSecondCharDistance).

EOCR.GetFirstCharCode

Returns the code of the pattern that matches at best a recognized character.

Namespace: Euresys.Open_eVision

[C#]

```
int GetFirstCharCode(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.GetFirstCharDistance

Computes the degree of similarity between the best matching pattern and a recognized character.

Namespace: Euresys.Open_eVision

[C#]

```
float GetFirstCharDistance(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

Returns 0 for a perfect match and 1 for a total mismatch.

EOCR.GetPatternBitmap

Returns a pointer to an image holding the pattern of the given index. This image should not be modified.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageBW8 GetPatternBitmap(
 int index
 )
```

Parameters

index

Pattern number (in range 0.. NumPatterns -1).

EOCR.GetPatternClass

Returns the class of a given pattern in the current font.

Namespace: Euresys.Open_eVision

```
[C#]
uint GetPatternClass(
 int index
 )
```

Parameters

index

Pattern number (in range 0..NumPatterns-1).

EOCR.GetPatternCode

Returns the character code of a given pattern in the current font.

Namespace: Euresys.Open_eVision

```
[C#]
int GetPatternCode(
 int index
 )
```

Parameters

index

Pattern number (in range 0..NumPatterns-1).

EOCR.GetSecondCharCode

Returns the code of the pattern that matches at second best a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
int GetSecondCharCode(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

EOCR.GetSecondCharDistance

Computes the degree of similarity between the second best matching pattern and a recognized character.

Namespace: Euresys.Open_eVision

```
[C#]
float GetSecondCharDistance(
 int index
 )
```

Parameters

index

Character number (in range 0..NumChars-1).

Remarks

Returns 0 for a perfect match and 1 for a total mismatch.

EOCR.HitChar

Returns true if the cursor is placed over the character specified by charIndex.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitChar(
 int cursorX,
 int cursorY,
 uint charIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

cursorX

Current cursor coordinates.

cursorY

Current cursor coordinates.

charIndex

Index of the character to be hit.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

If zooming and/or panning were used when drawing the ROI, the same values must be used with EOCR::HitChar.

EOCR.HitChars

Returns true if the cursor is placed over a character and sets the charIndex accordingly.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitChars(
 int cursorX,
 int cursorY,
 out uint charIndex,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

cursorX

Current cursor coordinates.

cursorY

Current cursor coordinates.

charIndex

Index of the character hit.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

If zooming and/or panning were used when drawing the ROI, the same values must be used with EOCR::HitChars.

EOCR.LearnPattern

Adds a new pattern to the font.

Namespace: Euresys.Open_eVision

[C#]

```
void LearnPattern(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint charIndex,
 int code,
 uint classes,
 bool autoSegmentation
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

charIndex

Index of the character (ASCII or Unicode) to learn.

code

Character code of the pattern.

classes

Class of the pattern, as defined by EOCRClass.

autoSegmentation

Boolean indicating whether the calculation of the true threshold has to be forced (default true) or bypassed (false).

Remarks

The pattern is selected by its index value, as assigned by the EOCR::FindAllChars process.

EOCR.LearnPatterns

Adds all the patterns from the source image to the font.

Namespace: Euresys.Open_eVision

[C#]

```
void LearnPatterns(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 string text,
 uint singleClass,
 bool autoSegmentation
 )

void LearnPatterns(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 string text,
 uint[] classes,
 bool autoSegmentation
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

text

String containing character codes of the patterns.

singleClass

If specified, all the characters of the string are associated with the same class(es), that is specified by singleClass.

autoSegmentation

Boolean indicating whether the calculation of the true threshold has to be forced (default true) or bypassed (false).

classes

If specified, the i-th character of the string is associated with the class specified by the i-th element of the vector classes.

Remarks

Patterns are ordered by their index value, as assigned by the EOCR::FindAllChars process.

EOCR.LineSpacingMode

Line spacing mode to sort the character boxes into lines. Default mode is ELineSpacingMode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ELineSpacingMode LineSpacingMode
  { get; set; }
```

EOCR.Load

Loads the EOCR object configuration.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
void Load(
 string path
 )
```

Parameters

serializer

The serializer.

path

The path from which to load the configuration.

Remarks

The given ESerializer must have been created for reading.

EOCR.MatchChar

Reads a single character, i.e. finds the best match between the patterns in the font and the given character.

Namespace: Euresys.Open_eVision

```
[C#]
void MatchChar(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint classes,
 int index,
 int shiftX,
 int shiftY
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

classes

Logical mask obtained by combining the values of EOCRClass, to specify to what classes the character may belong.

index

Character number (in range 0..NumChars-1).

shiftX

Horizontal translation applied to the character.

shiftY

Vertical translation applied to the character.

Remarks

A shift can be apply to the character. This operation can only be performed after a call to EOCR::FindAllChars.

EOCR.MatchingMode

Matching mode to use to compare characters to the template.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EMatchingMode MatchingMode
  { get; set; }
```

Remarks

By default, the root-mean-square error method is used. These modes are meant to be used without thresholding, that is when one of the DarkOnLight and LightOnDark colors are used.

EOCR.MaxCharHeight

Maximum character height.

Namespace: Euresys.Open_eVision

[C#]

```
int MaxCharHeight
  { get; set; }
```

Remarks

A character larger than the maximum width or higher than the maximum height is discarded. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.MaxCharWidth

Maximum character width.

Namespace: Euresys.Open_eVision

[C#]

```
int MaxCharWidth
  { get; set; }
```

Remarks

A character larger than the maximum width or higher than the maximum height is discarded. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.MinCharHeight

Minimum character height.

Namespace: Euresys.Open_eVision

[C#]

```
int MinCharHeight
```

```
{ get; set; }
```

Remarks

A character both narrower than the minimum width and lower than the minimum height is discarded by default (see EOCR::RemoveNarrowOrFlat). The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.MinCharWidth

Minimum character width.

Namespace: Euresys.Open_eVision

[C#]

```
int MinCharWidth
  { get; set; }
```

Remarks

A character both narrower than the minimum width and lower than the minimum height is discarded by default (see EOCR::RemoveNarrowOrFlat). The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.NewFont

Empties the contents of the font and sets the size of the pattern array to be used from then on.

Namespace: Euresys.Open_eVision

[C#]

```
void NewFont(
 uint patternWidth,
 uint patternHeight
 )
```

Parameters

patternWidth

Width of the normalized pattern representation, in pixels.

patternHeight

Height of the normalized pattern representation, in pixels.

Remarks

A larger pattern array improves the recognition sensitivity, at the expense of increased processing time.

EOCR.NoiseArea

Noise area.

Namespace: Euresys.Open_eVision

[C#]

```
int NoiseArea
  { get; set; }
```

Remarks

When a blob has an area smaller than this value, it is ignored. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.NumChars

Number of recognized characters.

Namespace: Euresys.Open_eVision

[C#]

```
int NumChars
  { get; }
```

EOCR.NumPatterns

Number of patterns in the current font.

Namespace: Euresys.Open_eVision

[C#]

```
int NumPatterns
  { get; }
```

EOCR.operator=

Copies all the data from another EOCR object into the current EOCR object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR operator=(
 Euresys.Open_eVision.EOCR other
 )
```

Parameters

other

EOCR object to be copied

EOCR.PatternHeight

Current pattern height, as set at the last EOCR::NewFont or EOCR::Load operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint PatternHeight
  { get; }
```

EOCR.PatternWidth

Current pattern width, as set at the last EOCR::NewFont or EOCR::Load operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint PatternWidth
  { get; }
```

EOCR.ReadText

Reads one or more rows of characters, i.e. finds the best match between the patterns in the font and the segmented characters.

Namespace: Euresys.Open_eVision

[C#]

```
string ReadText(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint classes,
 bool autoSegmentation
 )
string ReadText(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint[] classes,
 bool autoSegmentation
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumNumberOfCharacters

Maximum number of characters to be read.

classes

Pointer to an array of logical masks obtained by combining the values of EOCRClass, to specify to what classes the character may belong. Each mask value in the array applies to the corresponding character.

autoSegmentation

Boolean indicating whether the calculation of the true threshold has to be forced (default true) or bypassed (false).

Remarks

This operation can only be performed after a call to EOCR::FindAllChars.

EOCR.ReadTextWide

This method is deprecated.

DEPRECATED: Use the EOCR::ReadText method instead as it performs similarly to this method, except it returns UTF-8 instead of wide characters. Reads one or more rows of characters, i.e. finds the best match between the patterns in the font and the segmented characters.

Namespace: Euresys.Open_eVision

[C#]

```
string ReadTextWide(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint classes,
 bool autoSegmentation
 )
string ReadTextWide(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint[] classes,
 bool autoSegmentation
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumNumberOfCharacters

Maximum number of characters to be read.

classes

Pointer to an array of logical masks obtained by combining the values of EOCRClass, to specify to what classes the character may belong. Each mask value in the array applies to the corresponding character.

autoSegmentation

Boolean indicating whether the calculation of the true threshold has to be forced (default true) or bypassed (false).

Remarks

This operation can only be performed after a call to EOCR::FindAllChars.

EOCR.Recognize

Achieves all processing phases (blob analysis, character segmentation and pattern recognition) in a single operation.

Namespace: Euresys.Open_eVision

[C#]

```
string Recognize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint classes
 )

string Recognize(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint[] classes
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumNumberOfCharacters

Maximum number of characters to be read.

classes

Pointer to an array of logical mask obtained by combining the values of EOCRClass, to specify to what classes the character may belong. Each mask value in the array applies to the corresponding character.

Remarks

This method does the same as a sequence of EOCR::BuildObjects/EOCR::FindAllChars/EOCR::ReadText,

EOCR.RecognizeWide

This method is deprecated.

DEPRECATED: use the EOCR::Recognize method instead as it performs similarly to this method, except it returns UTF-8 instead of wide characters. Achieves all processing phases (blob analysis, character segmentation and pattern recognition) in a single operation.

Namespace: Euresys.Open_eVision

[C#]

```
string RecognizeWide(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint classes
 )

string RecognizeWide(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 int maximumNumberOfCharacters,
 uint[] classes
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

maximumNumberOfCharacters

Maximum number of characters to be read.

classes

Pointer to an array of logical mask obtained by combining the values of EOCRClass, to specify to what classes the character may belong. Each mask value in the array applies to the corresponding character.

Remarks

This method does the same as a sequence of EOCR::BuildObjects/EOCR::FindAllChars/EOCR::ReadText,

EOCR.RelativeSpacing

Relative spacing value.

Namespace: Euresys.Open_eVision

[C#]

```
float RelativeSpacing
  { get; set; }
```

Remarks

This value is the ratio of the width of the spaces between characters and the character width. For example, characters 25 pixels wide separated by 10 pixels gaps correspond to a relative spacing of 10/25 = 0.4. The default value of this parameter is 0, corresponding to no spacing. This parameter is relevant only when the CutLargeChars mode is enabled. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.RelativeThreshold

Relative threshold used for image segmentation.

Namespace: Euresys.Open_eVision

```
[C#]
float RelativeThreshold
  { get; set; }
```

Remarks

The RelativeThreshold is the fraction of the image pixels that will be set below the threshold. Only used when the EOCR::Threshold property is set to EThresholdMode_Relative. The default value is 0.5.

EOCR.RemoveBorder

Flag indicating whether all blobs touching the ROI edges are automatically discarded.

Namespace: Euresys.Open_eVision

```
[C#]
bool RemoveBorder
  { get; set; }
```

Remarks

If true, all blobs touching the ROI edges are automatically discarded. By default, this feature is turned on. The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.RemoveNarrowOrFlat

Flag indicating whether the characters are discarded when either dimension falls below the minimum value

Namespace: Euresys.Open_eVision

```
[C#]
bool RemoveNarrowOrFlat
  { get; set; }
```

Remarks

If true, characters are discarded if either their width or their height is smaller than the minimum value. By default, this feature is disabled (only smaller characters in *both* height and width are discarded: the condition could be written NarrowAndFlat). The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.RemovePattern

Removes a given pattern from the current font.

Namespace: Euresys.Open_eVision

```
[C#]
void RemovePattern(
 uint index
 )
```

Parameters

index

Index of the pattern to be removed from the current font.

EOCR.Save

Saves the EOCR object configuration.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
void Save(
 string path
 )
```

Parameters

serializer

The serializer.

path

The path from which to save the configuration.

Remarks

The given ESerializer must have been created for writing.

EOCR.SegmentationMode

Segmentation mode.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ESegmentationMode SegmentationMode
  { get; set; }
```

Remarks

The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.SetPatternClass

Sets the class of a given pattern in the current font.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPatternClass(
 int index,
 uint classIdx
 )
```

Parameters

index

Pattern number (in range 0..NumPatterns-1).

classIdx

The class.

EOCR.SetPatternCode

Sets the character code of a given pattern in the current font.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPatternCode(
 int index,
 int code
 )
```

Parameters

index

Pattern number (in range 0..NumPatterns-1).

code

The character code.

EOCR.ShiftingMode

Shifting mode to use to compare characters to the template.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EShiftingMode ShiftingMode
  { get; set; }
```

EOCR.ShiftXTolerance

Horizontal translation tolerance around the nominal position when the character positions are explicitly specified.

Namespace: Euresys.Open_eVision

[C#]

```
uint ShiftXTolerance
  { get; set; }
```

Remarks

By default, no shifting is allowed (ShiftX = 0). The tolerance can be used in two ways: either each character is moved individually until the best match is found, or the set of characters is matched as a whole, until the best average error is reached. See EOCR::ShiftingMode.

EOCR.ShiftYTolerance

Vertical translation tolerance around the nominal position when the character positions are explicitly specified.

Namespace: Euresys.Open_eVision

[C#]

```
uint ShiftYTolerance
  { get; set; }
```

Remarks

By default, no shifting is allowed (ShiftY = 0). The tolerance can be used in two ways: either each character is moved individually until the best match is found, or the set of characters is matched as a whole, until the best average error is reached. See EOCR::ShiftingMode.

EOCR.TextColor

Text color.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCRColor TextColor
  { get; set; }
```

Remarks

The segmentation parameters *must* be the same for both learning and recognition process.

EOCR.Threshold

Threshold mode used for image segmentation.

Namespace: Euresys.Open_eVision

[C#]

```
int Threshold
  { get; set; }
```

Remarks

Threshold value as defined by the EThresholdMode enum. By default, the "minimum residue" mode is used to determine the threshold value. In case of an absolute threshold, the threshold value is given instead.

EOCR.TrueThreshold

Absolute threshold level when using a single threshold.

Namespace: Euresys.Open_eVision

[C#]

```
uint TrueThreshold
  { get; }
```

Remarks

This value is valid only when the EOCR::BuildObjects or EOCR::ReadText method has been called beforehand.

4.170. EOCR2 Class

Manages a complete context for the font-dependent printed character reader implemented in EasyOCR2.

Namespace: Euresys.Open_eVision

Properties

AllowedCharacterTypes	Sets which character types are expected when EOCR2::EnabledTopology is false. The set of expected character types is represented by a bitwise combination of different EasyOCR2CharacterFilter.
CharacterDatabase	Sets the EOCR2CharacterDatabase used for recognizing text.
CharsHeight	Sets the expected character height in pixels.

CharsMaxFragmentation	Sets the **CharsMaxFragmentation** parameter for the segmentation algorithm. This will determine the minimum size a blob should be in order to be considered a potential character. A high setting will allow only larger blobs, a low setting will also allow smaller blobs. The minimum blob size to be considered a potential character is defined as: `CharsMaxFragmentation * CharsHeight * CharsWidth`
CharsSpacingBias	Sets the **CharSpacingBias** parameter for the topology fitting algorithm, which optimizes the spacing of the bounding boxes to optimally fit the detected blobs. This will determine whether the method is biased toward finding narrow spacing, wide spacing or is neutral.
CharsWidthBias	Sets the **CharsWidthBias** parameter for the topology fitting algorithm, which optimizes the width of the bounding boxes to optimally fit the detected blobs. This will determine whether the method is biased toward finding narrow boxes, wide boxes or is neutral.
CharsWidthRange	Sets the range of expected character widths in pixels.
Classifier	Sets the **EOCR2Classifier** parameter for the recognition algorithm. This will determine which classifier will be used for the recognition.
DetectionDelta	Sets the **DetectionDelta** parameter for the segmentation algorithm. This will determine the range of grayscale-values used to determine the stability of a blob. A low setting will make the algorithm more sensitive to noise, a high setting will make the algorithm insensitive to blobs with low contrast to the background.
DetectionMethod	Sets the **EOCR2DetectionMethod** parameter for the topology fitting algorithm, which will place textboxes on the segmentation results, matching the given topology.
EnableCutLargeCharacter	Sets whether EOCR2 detection should split or not segmented blobs into multiple characters if they are wider than the given character width range parameter. The default setting for this parameter is false and it is only applicable when the topology is not required or when the detectionMethod is set to Proportional.
EnabledTopology	Sets whether the topology is required or not. If it is, EOCR2 will try to detect the topology accordingly with the EOCR2DetectionMethod parameter. The default setting for this parameter is true and topology has to be given with EOCR2.
EnableGPU	Sets/Gets whether EOCR2 uses a GPU to accelerate its processing.
EnableOffSizeCharacter	Sets whether EOCR2 allows or not the detection of characters whose size (width and height) is out of the size parameters if they are in the vicinity of characters in valid size range. The default setting for this parameter is true and it is only applicable when the topology is not required.
EnableSecondPassGlobalSegmentation	Sets whether EOCR2 segmentation should do or not do an extra pass to determine the best threshold using the Global segmentation method. The default setting for this parameter is false and it is only applicable when the segmentation method is set to Global.

GlobalSegmentationRelativeThreshold	Sets/Gets the fraction of the image pixels that will be set below the threshold used when the segmentation method is set to Global. It is only used when the GlobalSegmentationThresholdMode value is Relative .
GlobalSegmentationThresholdMode	Sets/Gets the EThresholdMode used when the segmentation method is set to Global. From the EThresholdMode, a threshold will be computed during the segmentation. While using WhiteOnBlack, pixels above or equal to the threshold will be segmented. While using BlackOnWhite, pixels under the threshold will be segmented.
GPUIndexes	Sets/gets the GPUs to use when computing.
MaxVariation	Sets the **maxVariation** parameter for the segmentation algorithm. This parameter determines how stable a blob in the image should be in order to be considered a potential character, a region with clearly defined edges is generally considered stable while a blurry region is not. A high setting allows more unstable blobs, a low setting allows only very stable blobs.
NumDetectionPasses	Sets the **NumDetectionPasses** parameter for the topology fitting algorithm, which will place textboxes on the segmentation results (blobs), matching the given topology. The first pass will consider all blobs, subsequent passes will only consider those blobs that are inside the textboxes from the previous pass, sometimes resulting in a more optimal fit.
ReadText	Outputs an EOCR2Text structure containing the detailed detection and recognition results.
RelativeSpacesWidthRange	Sets the range of expected spaces between words as a fraction of the character width.
RepasteObjects	Sets whether EOCR2 groups or does not group the blobs believed to belong to the same character. The default setting for this parameter is true and it is only applicable when the topology is not required.
SegmentationMethod	Sets the **EOCR2SegmentationMethod** parameter for the segmentation algorithm, which will detect blobs in the image.
TextAngleRange	Sets the **TextAngleRange** parameter for the topology fitting algorithm, which will attempt to find the angle of the text in the image with respect to the horizontal. This will determine the center of the range of angles that will be tested, defined as: `TextAngleRange.min() <= angle <= TextAngleRange.max()`
TextPolarity	Sets the **TextPolarity** parameter for the segmentation algorithm. This will determine whether the algorithm searches for light blobs in a dark background or for dark blobs in a light background.
TimeOut	Time-out for the EOCR2::Read, EOCR2::Detect and EOCR2::Recognize methods.

Topology	Sets the topology of the text that should be found in the image. A modified version of Regex expressions are used, where: **.**(dot) represents any character (not including a space). **L** represents a letter. **Lu** represents an uppercase letter. **Ll** represents a lowercase letter. **N** represents a digit. **P** represents a punctuation character !"#&'()*,-./:;<>?[\]_{|}~ **S** represents the symbols $+-<=>|~ **\n** represents a line break. ' ' (space) represents a space between two words. Combinations can be made, for example: `[LN]` represents an alpha-numeric character. To specify multiple characters, simply add `{n}` at the end for n characters. If the amount of characters is uncertain, specify `{n,m}` for a minimum of n characters and a maximum of m characters. The topology `"[LuN]{3,5}PN{4} \n .{5} LL"` represents a text comprised of 2 lines: The first line has 1 word composed of 3 to 5 uppercase alpha-numeric characters, followed by a punctuation character and 4 numbers. The second line has 2 words. The first word comprises of 5 wildcard characters, the second word has 2 alphabetic characters (upper- or lowercase).

Methods

AddCharactersToDatabase	Reads reference characters from disk and adds them to the database used for text recognition. The characters can be read from a trueType (.ttf/.ttc) file or from an EasyOCR2 database file.
AddClassifierForSymbol	Adds the **EOCR2Classifier** for the given specific symbol combination during the recognition instead of the one set by EOCR2.
ClearCharacterDatabase	Clears the reference character database from this EOCR2 instance.
ClearResult	Clear the current detected text if it exists.
Detect	Finds the text in an image as follows: (1) Detects potential characters in the image following the given text polarity. (2) Fits bounding boxes to the detected characters, following the given topology and character width/height. (3) Extracts the detected characters from the image. The detected characters are output as an EOCR2Text structure.
DrawDetection	Draws the bounding boxes found by the topology detection algorithm.
DrawDetectionWithCurrentPen	Draws the bounding boxes found by the topology detection algorithm with the current pen.
DrawRecognition	Draws the recognized text next to the character bounding box in the image.
DrawRecognitionWithCurrentPen	Draws the recognized text next to the character bounding box in the image with the current pen.

DrawSegmentation	Draws the blobs found by the segmentation algorithm.
DrawSegmentationWithCurrentPen	Draws the blobs found by the segmentation algorithm with the current pen.
EOCR2	Constructs an EOCR2 context.
GetClassifierForSymbol	Gets the **EOCR2Classifier** for the given specific symbol combination during the recognition instead of the one set by EOCR2.
HitTestChar	Tests the cursor position for the presence of a character. If one is present under the cursor, it returns true and fills the EOCR2Char object passed as parameter.
HitTestLine	Tests the cursor position for the presence of a line. If one is present under the cursor, it returns true and fills the EOCR2Line object passed as parameter.
HitTestText	Tests the cursor position for the presence of a text. If one is present under the cursor, it returns true and fills the EOCR2Text object passed as parameter.
HitTestWord	Tests the cursor position for the presence of a word. If one is present under the cursor, it returns true and fills the EOCR2Word object passed as parameter.
Learn	Learns reference characters from a given EOCR2Text/EOCR2Line/EOCR2Word/EOCR2Char instance, containing user-specified character codes.
Load	Loads a model, containing parameter settings used for all operations in EOCR2, from disk.
operator=	Assignment operator, copies another EOCR2 instance to this one.
Read	Performs all steps required for reading text from an image: (1) Detects potential characters in the image following the given text polarity and character width/height. (2) Fits bounding boxes to the detected characters, following the given topology and character width/height. (3) Recognizes the detected characters using the given reference character database. The read text is output as a string.
Recognize	Recognizes the characters in a given EOCR2Text instance, based on a given reference font.
RemoveClassifierForSymbol	Removes the **EOCR2Classifier** for the given specific symbol combination during the recognition so the one set by EOCR2 will be used.
Save	Saves the model to disk, containing the current parameter setting used for all operations in EOCR2.
SaveCharacterDatabase	Saves the current reference character database to disk.

EOCR2.AddCharactersToDatabase

Reads reference characters from disk and adds them to the database used for text recognition. The characters can be read from a trueType (.ttf/.ttc) file or from an EasyOCR2 database file.

Namespace: Euresys.Open_eVision

[C#]

```
void AddCharactersToDatabase(
 string file
 )
void AddCharactersToDatabase(
 string file,
 Euresys.Open_eVision.EasyOCR2CharacterFilter filter
 )
```

Parameters

file

A string containing the path of the file.

filter

Optional parameter; an EasyOCR2CharacterFilter that tells the method which subset of the character-set should be loaded.

EOCR2.AddClassifierForSymbol

Adds the **EOCR2Classifier** for the given specific symbol combination during the recognition instead of the one set by EOCR2.

Namespace: Euresys.Open_eVision

[C#]

```
void AddClassifierForSymbol(
 string symbol,
 Euresys.Open_eVision.EOCR2Classifier classifier
 )
```

Parameters

symbol

-

classifier

-

Remarks

The only accepted EOCR2Classifier is currently DatabaseClassifier. Symbol combinations are the same as used in the topology, ex : Lu, P or [LlNS]. See EOCR2 for more details.

EOCR2.AllowedCharacterTypes

Sets which character types are expected when EOCR2::EnabledTopology is false. The set of expected character types is represented by a bitwise combination of different EasyOCR2CharacterFilter.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EasyOCR2CharacterFilter AllowedCharacterTypes
    { get; set; }
```

Remarks

For example, digits and uppercase letters can be expressed by UpperCaseLetters | Digits. The default setting for this parameter is ASCII.

EOCR2.CharacterDatabase

Sets the EOCR2CharacterDatabase used for recognizing text.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2CharacterDatabase CharacterDatabase
    { get; set; }
```

Remarks

Setting a new characterDatabase will overwrite the current one.

EOCR2.CharsHeight

Sets the expected character height in pixels.

Namespace: Euresys.Open_eVision

[C#]

```
int CharsHeight
    { get; set; }
```

EOCR2.CharsMaxFragmentation

Sets the **CharsMaxFragmentation** parameter for the segmentation algorithm. This will determine the minimum size a blob should be in order to be considered a potential character. A high setting will allow only larger blobs, a low setting will also allow smaller blobs.
The minimum blob size to be considered a potential character is defined as:
`CharsMaxFragmentation * CharsHeight * CharsWidth`

Namespace: Euresys.Open_eVision

```
[C#]
float CharsMaxFragmentation
  { get; set; }
```

Remarks

This parameter should be set between 0.0 and 1.0, the default setting is 0.1.

EOCR2.CharsSpacingBias

Sets the **CharSpacingBias** parameter for the topology fitting algorithm, which optimizes the spacing of the bounding boxes to optimally fit the detected blobs. This will determine whether the method is biased toward finding narrow spacing, wide spacing or is neutral.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EasyOCR2CharSpacingBias CharsSpacingBias
  { get; set; }
```

Remarks

The default setting for this parameter is Neutral

EOCR2.CharsWidthBias

Sets the **CharsWidthBias** parameter for the topology fitting algorithm, which optimizes the width of the bounding boxes to optimally fit the detected blobs. This will determine whether the method is biased toward finding narrow boxes, wide boxes or is neutral.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EasyOCR2CharWidthBias CharsWidthBias
  { get; set; }
```

Remarks

The default setting for this parameter is Neutral

EOCR2.CharsWidthRange

Sets the range of expected character widths in pixels.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EIntegerRange CharsWidthRange
  { get; set; }
```

Remarks

The CharsWidthRange is returned by reference, changing it will affect the internal state of the EOCR2 object.

EOCR2.Classifier

Sets the **EOCR2Classifier** parameter for the recognition algorithm. This will determine which classifier will be used for the recognition.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2Classifier Classifier
  { get; set; }
```

Remarks

The default setting for this parameter is DatabaseClassifier.

EOCR2.ClearCharacterDatabase

Clears the reference character database from this EOCR2 instance.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearCharacterDatabase(
 )
```

EOCR2.ClearResult

Clear the current detected text if it exists.

Namespace: Euresys.Open_eVision

[C#]

```
void ClearResult(
 )
```

EOCR2.Detect

Finds the text in an image as follows:
(1) Detects potential characters in the image following the given text polarity.
(2) Fits bounding boxes to the detected characters, following the given topology and character width/height.
(3) Extracts the detected characters from the image.
The detected characters are output as an EOCR2Text structure.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Text Detect(
 Euresys.Open_eVision.EROIBW8 srcRoi
 )

Euresys.Open_eVision.EOCR2Text Detect(
 Euresys.Open_eVision.EROIBW8 srcRoi,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

srcRoi

The source image/ROI.

region

The region of interest where the detection is performed

Remarks

The variables Topology, CharHeight, CharWidth should be set before performing this operation. If the srcRoi is smaller than 3X3, an exception will be thrown.

EOCR2.DetectionDelta

Sets the **DetectionDelta** parameter for the segmentation algorithm. This will determine the range of grayscale-values used to determine the stability of a blob. A low setting will make the algorithm more sensitive to noise, a high setting will make the algorithm insensitive to blobs with low contrast to the background.

Namespace: Euresys.Open_eVision

[C#]

```
int DetectionDelta
  { get; set; }
```

Remarks

This parameter should be set between 0 and 127, the default setting is 12.

EOCR2.DetectionMethod

Sets the **EOCR2DetectionMethod** parameter for the topology fitting algorithm, which will place textboxes on the segmentation results, matching the given topology.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2DetectionMethod DetectionMethod
  { get; set; }
```

Remarks

The default setting for this parameter is EOCR2DetectionMethod. This parameter is ignored when the topology is not required.

EOCR2.DrawDetection

Draws the bounding boxes found by the topology detection algorithm.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawDetection(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.EasyOCR2DrawDetectionStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawDetection(
 IntPtr hdc,
 Euresys.Open_eVision.EasyOCR2DrawDetectionStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawDetection(
 IntPtr hdc,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EasyOCR2DrawDetectionStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

style

The style in which each detection box should be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

hdc

Handle of the device context on which to draw.

color

The color in which to draw the detection.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR2.DrawDetectionWithCurrentPen

This method is deprecated.

Draws the bounding boxes found by the topology detection algorithm with the current pen.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawDetectionWithCurrentPen(
 IntPtr hdc,
 Euresys.Open_eVision.EasyOCR2DrawDetectionStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hdc

Handle of the device context on which to draw.

style

The style in which each detection box should be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR2.DrawRecognition

Draws the recognized text next to the character bounding box in the image.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawRecognition(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.EasyOCR2DrawRecognitionStyle style,
 uint cHeight,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawRecognition(
 IntPtr hdc,
 Euresys.Open_eVision.EasyOCR2DrawRecognitionStyle style,
 uint cHeight,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawRecognition(
 IntPtr hdc,
 Euresys.Open_eVision.ERGBColor textColor,
 Euresys.Open_eVision.ERGBColor backgroundColor,
 Euresys.Open_eVision.EasyOCR2DrawRecognitionStyle style,
 uint cHeight,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

style

The style in which each recognition result should be drawn.

cHeight

The character-height with which the recognized text should be displayed.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

hdc

Handle of the device context on which to draw.

textColor

The color in which to draw the recognized text.

backgroundColor

The color of the box in which the text is displayed.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR2.DrawRecognitionWithCurrentPen

This method is deprecated.

Draws the recognized text next to the character bounding box in the image with the current pen.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawRecognitionWithCurrentPen(
 IntPtr hdc,
 Euresys.Open_eVision.EasyOCR2DrawRecognitionStyle style,
 uint cHeight,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hdc

Handle of the device context on which to draw.

style

The style in which each recognition result should be drawn.

cHeight

The character-height with which the recognized text should be displayed.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR2.DrawSegmentation

Draws the blobs found by the segmentation algorithm.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawSegmentation(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.EasyOCR2DrawSegmentationStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawSegmentation(
 IntPtr hdc,
 Euresys.Open_eVision.EasyOCR2DrawSegmentationStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawSegmentation(
 IntPtr hdc,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EasyOCR2DrawSegmentationStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

style

The style in which each blob should be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

hdc

Handle of the device context on which to draw.

color

The color in which to draw the segmentation.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR2.DrawSegmentationWithCurrentPen

This method is deprecated.

Draws the blobs found by the segmentation algorithm with the current pen.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawSegmentationWithCurrentPen(
 IntPtr hdc,
 Euresys.Open_eVision.EasyOCR2DrawSegmentationStyle style,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hdc

Handle of the device context on which to draw.

style

The style in which each blob should be drawn.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EOCR2.EnableCutLargeCharacter

Sets whether EOCR2 detection should split or not segmented blobs into multiple characters if they are wider than the given character width range parameter. The default setting for this parameter is false and it is only applicable when the topology is not required or when the detectionMethod is set to Proportional.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableCutLargeCharacter
    { get; set; }
```

EOCR2.EnabledTopology

Sets whether the topology is required or not. If it is, EOCR2 will try to detect the topology accordingly with the EOCR2DetectionMethod parameter. The default setting for this parameter is true and topology has to be given with EOCR2.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnabledTopology
    { get; set; }
```

EOCR2.EnableGPU

Sets/Gets whether EOCR2 uses a GPU to accelerate its processing.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableGPU
    { get; set; }
```

Remarks

Currently only the recognition with a deep-learning classifier can be accelerated with GPU.

EOCR2.EnableOffSizeCharacter

Sets whether EOCR2 allows or not the detection of characters whose size (width and height) is out of the size parameters if they are in the vicinity of characters in valid size range. The default setting for this parameter is true and it is only applicable when the topology is not required.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableOffSizeCharacter
    { get; set; }
```

EOCR2.EnableSecondPassGlobalSegmentation

Sets whether EOCR2 segmentation should do or not do an extra pass to determine the best threshold using the Global segmentation method. The default setting for this parameter is false and it is only applicable when the segmentation method is set to Global.

Namespace: Euresys.Open_eVision

```
[C#]
bool EnableSecondPassGlobalSegmentation
  { get; set; }
```

Remarks

The extra pass adds computation.

EOCR2.EOCR2

Constructs an EOCR2 context.

Namespace: Euresys.Open_eVision

```
[C#]
void EOCR2(
 )
void EOCR2(
 Euresys.Open_eVision.EOCR2 other
 )
```

Parameters

other

-

EOCR2.GetClassifierForSymbol

Gets the **EOCR2Classifier** for the given specific symbol combination during the recognition instead of the one set by EOCR2.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2Classifier GetClassifierForSymbol(
 string symbol
 )
```

Parameters

symbol

-

Remarks

Symbol combinations are the same as used in the topology, ex : Lu, P or [LINS]. See EOCR2 for more details.

EOCR2.GlobalSegmentationRelativeThreshold

Sets/Gets the fraction of the image pixels that will be set below the threshold used when the segmentation method is set to Global. It is only used when the GlobalSegmentationThresholdMode value is Relative .

Namespace: Euresys.Open_eVision

[C#]

```
float GlobalSegmentationRelativeThreshold
  { get; set; }
```

EOCR2.GlobalSegmentationThresholdMode

Sets/Gets the EThresholdMode used when the segmentation method is set to Global. From the EThresholdMode, a threshold will be computed during the segmentation. While using WhiteOnBlack, pixels above or equal to the threshold will be segmented. While using BlackOnWhite, pixels under the threshold will be segmented.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EThresholdMode GlobalSegmentationThresholdMode
  { get; set; }
```

Remarks

The default setting for this parameter is EThresholdMode.

EOCR2.GPUIndexes

Sets/gets the GPUs to use when computing.

Namespace: Euresys.Open_eVision

[C#]

```
uint[] GPUIndexes
  { get; set; }
```

EOCR2.HitTestChar

Tests the cursor position for the presence of a character. If one is present under the cursor, it returns true and fills the EOCR2Char object passed as parameter.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTestChar(
 Euresys.Open_eVision.EOCR2Char character,
 ref int lineN,
 ref int wordN,
 ref int charN,
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

character
Returns the character if one was detected under the cursor.

lineN
Returns the line-number of the character if one was detected under the cursor.

wordN
Returns the word-number of the character if one was detected under the cursor.

charN
Returns the character-number of the character if one was detected under the cursor.

x
Horizontal position of the cursor.

y
Vertical position of the cursor.

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY
Vertical panning value expressed in pixels. By default, no panning occurs.

EOCR2.HitTestLine

Tests the cursor position for the presence of a line. If one is present under the cursor, it returns true and fills the EOCR2Line object passed as parameter.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTestLine(
 Euresys.Open_eVision.EOCR2Line line,
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

line
Object to fill if a line was detected under the cursor.

x
Horizontal position of the cursor.

y
Vertical position of the cursor.

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY
Vertical panning value expressed in pixels. By default, no panning occurs.

EOCR2.HitTestText

Tests the cursor position for the presence of a text. If one is present under the cursor, it returns true and fills the EOCR2Text object passed as parameter.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTestText(
 Euresys.Open_eVision.EOCR2Text text,
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

text

Object to fill if a text was detected under the cursor.

x

Horizontal position of the cursor.

y

Vertical position of the cursor.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

EOCR2.HitTestWord

Tests the cursor position for the presence of a word. If one is present under the cursor, it returns true and fills the EOCR2Word object passed as parameter.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTestWord(
 Euresys.Open_eVision.EOCR2Word word,
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

word
Object to fill if a word was detected under the cursor.

x
Horizontal position of the cursor.

y
Vertical position of the cursor.

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY
Vertical panning value expressed in pixels. By default, no panning occurs.

EOCR2.Learn

Learns reference characters from a given EOCR2Text/EOCR2Line/EOCR2Word/EOCR2Char instance, containing user-specified character codes.

Namespace: Euresys.Open_eVision

[C#]

```
void Learn(
 Euresys.Open_eVision.EOCR2Char character
 )

void Learn(
 Euresys.Open_eVision.EOCR2Word word
 )

void Learn(
 Euresys.Open_eVision.EOCR2Line line
 )

void Learn(
 Euresys.Open_eVision.EOCR2Text text
 )
```

Parameters

character

A single EOCR2Char character, containing the detected character from the reference image as well as the corresponding character code.

word

A single EOCR2Word word, containing the detected characters in a single word from the reference image as well as the corresponding character codes.

line

A single EOCR2Line line, containing the detected characters in a single line from the reference image as well as the corresponding character codes.

text

A complete EOCR2Text text, containing all detected characters from the reference image as well as the corresponding character codes.

Remarks

The EOCR2Text/EOCR2Line/EOCR2Word/EOCR2Char instance should contain detected characters from a reference image as well as their corresponding character codes.

EOCR2.Load

Loads a model, containing parameter settings used for all operations in EOCR2, from disk.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string modelPath
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

modelPath

A string containing the full path to the model file.

serializer

The serializer.

EOCR2.MaxVariation

Sets the **maxVariation** parameter for the segmentation algorithm. This parameter determines how stable a blob in the image should be in order to be considered a potential character, a region with clearly defined edges is generally considered stable while a blurry region is not. A high setting allows more unstable blobs, a low setting allows only very stable blobs.

Namespace: Euresys.Open_eVision

[C#]

```
float MaxVariation
  { get; set; }
```

Remarks

This parameter should be set between 0.0 and 1.0, the default setting is 0.25.

EOCR2.NumDetectionPasses

Sets the **NumDetectionPasses** parameter for the topology fitting algorithm, which will place textboxes on the segmentation results (blobs), matching the given topology. The first pass will consider all blobs, subsequent passes will only consider those blobs that are inside the textboxes from the previous pass, sometimes resulting in a more optimal fit.

Namespace: Euresys.Open_eVision

[C#]

```
int NumDetectionPasses
  { get; set; }
```

Remarks

The default setting for this parameter is 1, the setting can be either 1 or 2.

EOCR2.operator=

Assignment operator, copies another EOCR2 instance to this one.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2 operator=(
 Euresys.Open_eVision.EOCR2 other
 )
```

Parameters

other

The EOCR2 instance to copy from.

EOCR2.Read

Performs all steps required for reading text from an image:
(1) Detects potential characters in the image following the given text polarity and character width/height.
(2) Fits bounding boxes to the detected characters, following the given topology and character width/height.
(3) Recognizes the detected characters using the given reference character database.
The read text is output as a string.

Namespace: Euresys.Open_eVision

[C#]

```
string Read(
 Euresys.Open_eVision.EROIBW8 srcRoi
 )

string Read(
 Euresys.Open_eVision.EROIBW8 srcRoi,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

srcRoi

The source image/ROI.

region

The region of interest where the reading is performed

Remarks

The variables TextPolarity, Topology, CharHeight, CharWidth should be set and a reference character database should be set before performing this operation. If the srcRoi is smaller than 3X3, an exception will be thrown.

EOCR2.ReadText

Outputs an EOCR2Text structure containing the detailed detection and recognition results.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Text ReadText
  { get; }
```

EOCR2.Recognize

Recognizes the characters in a given EOCR2Text instance, based on a given reference font.

Namespace: Euresys.Open_eVision

[C#]

```
string Recognize(
 Euresys.Open_eVision.EOCR2Text text
 )
string Recognize(
 Euresys.Open_eVision.EOCR2Text text,
 Euresys.Open_eVision.EROIBW8 srcRoi
 )
```

Parameters

text

EOCR2Text structure containing the detected characters from the image.

srcRoi

The source image/ROI.

Remarks

A reference character database should be provided before performing this operation. The overloaded function that uses an ROI is not yet implemented.

EOCR2.RelativeSpacesWidthRange

Sets the range of expected spaces between words as a fraction of the character width.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFloatRange RelativeSpacesWidthRange
  { get; set; }
```

Remarks

This parameter only affects the detection when the detectionMethod is set to FixedWidth or when the topology is not required. The RelativeSpacesWidthRange is returned by reference, changing it will affect the internal state of the EOCR2 object.

EOCR2.RemoveClassifierForSymbol

Removes the **EOCR2Classifier** for the given specific symbol combination during the recognition so the one set by EOCR2 will be used.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveClassifierForSymbol(
 string symbol
 )
```

Parameters

symbol

-

Remarks

Symbol combinations are the same as used in the topology, ex : Lu, P or [LINS]. See EOCR2 for more details.

EOCR2.RepasteObjects

Sets whether EOCR2 groups or does not group the blobs believed to belong to the same character. The default setting for this parameter is true and it is only applicable when the topology is not required.

Namespace: Euresys.Open_eVision

[C#]

```
bool RepasteObjects
  { get; set; }
```

EOCR2.Save

Saves the model to disk, containing the current parameter setting used for all operations in EOCR2.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string modelPath
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

modelPath

A string containing the full path to the model file.

serializer

The serializer.

Remarks

It is advised to use a file extension that is non-standard (for instance *.ocr2)

EOCR2.SaveCharacterDatabase

Saves the current reference character database to disk.

Namespace: Euresys.Open_eVision

```
[C#]
void SaveCharacterDatabase(
 string file
 )
```

Parameters

file

A string containing the path of the file.

EOCR2.SegmentationMethod

Sets the **EOCR2SegmentationMethod** parameter for the segmentation algorithm, which will detect blobs in the image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2SegmentationMethod SegmentationMethod
  { get; set; }
```

Remarks

The default setting for this parameter is Local.

EOCR2.TextAngleRange

Sets the **TextAngleRange** parameter for the topology fitting algorithm, which will attempt to find the angle of the text in the image with respect to the horizontal. This will determine the center of the range of angles that will be tested, defined as:
`TextAngleRange.min() <= angle <= TextAngleRange.max()`

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFloatRange TextAngleRange
  { get; set; }
```

Remarks

The textAngleRange is returned by reference, changing it will affect the internal state of the EOCR2 object. The default setting for this parameter is -20 degrees to +20 degrees.

EOCR2.TextPolarity

Sets the **TextPolarity** parameter for the segmentation algorithm. This will determine whether the algorithm searches for light blobs in a dark background or for dark blobs in a light background.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EasyOCR2TextPolarity TextPolarity
  { get; set; }
```

Remarks

Default setting is WhiteOnBlack.

EOCR2.TimeOut

Time-out for the EOCR2::Read, EOCR2::Detect and EOCR2::Recognize methods.

Namespace: Euresys.Open_eVision

[C#]

```
System.UInt64 TimeOut
  { get; set; }
```

Remarks

If the processing time of one of these functions becomes longer than the set time-out, the processing is stopped and an exception is thrown. In that case, the error code of the exception is TimeoutReached. The time-out is set in microseconds. This time-out is not a real time-out. The processing is stopped as soon as possible after the time-out has been reached. This means that the time elapsed effectively in the method can be greater than the time-out in itself.

EOCR2.Topology

Sets the topology of the text that should be found in the image. A modified version of Regex expressions are used, where:
.(dot) represents any character (not including a space).
L represents a letter.
Lu represents an uppercase letter.
Ll represents a lowercase letter.
N represents a digit.
P represents a punctuation character !"#&'()*,-./:;<>?[\]_{|}~
S represents the symbols $+-<=>|~
\n represents a line break.
' ' (space) represents a space between two words.
Combinations can be made, for example: `[LN]` represents an alpha-numeric character.
To specify multiple characters, simply add `{n}` at the end for n characters. If the amount of characters is uncertain, specify `{n,m}` for a minimum of n characters and a maximum of m characters.
The topology `"[LuN]{3,5}PN{4} \n .{5} LL"` represents a text comprised of 2 lines:
The first line has 1 word composed of 3 to 5 uppercase alpha-numeric characters, followed by a punctuation character and 4 numbers.
The second line has 2 words. The first word comprises of 5 wildcard characters, the second word has 2 alphabetic characters (upper- or lowercase).

Namespace: Euresys.Open_eVision

```
[C#]
string Topology
  { get; set; }
```

4.171. EOCR2Char Class

Holds all information related to a single detected character.

Namespace: Euresys.Open_eVision

Properties

Bitmap	The bitmap associated to this character.
BoundingBox	The bounding box associated to this character.
Candidates	The list of recognition results for all reference-characters with their respective scores. The list is sorted from the best score to the worst one.
Text	The true value of the character, this is used during the learning phase.
TextCode	The true value of the character, this is used during the learning phase.

Methods

EOCR2Char	Constructs an EOCR2Char context.
operator=	Copies all the data from another EOCR2Char object into the current EOCR2Char object

EOCR2Char.Bitmap

The bitmap associated to this character.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW8 Bitmap
  { get; }
```

EOCR2Char.BoundingBox

The bounding box associated to this character.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangle BoundingBox
  { get; }
```

EOCR2Char.Candidates

The list of recognition results for all reference-characters with their respective scores. The list is sorted from the best score to the worst one.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2CharacterCandidate[] Candidates
  { get; }
```

EOCR2Char.EOCR2Char

Constructs an EOCR2Char context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2Char(
 )
void EOCR2Char(
 Euresys.Open_eVision.EOCR2Char other
 )
```

Parameters

other

EOCR2Char object to be copied.

EOCR2Char.operator=

Copies all the data from another EOCR2Char object into the current EOCR2Char object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Char operator=(
 Euresys.Open_eVision.EOCR2Char other
 )
```

Parameters

other

EOCR2Char object to be copied

EOCR2Char.Text

The true value of the character, this is used during the learning phase.

Namespace: Euresys.Open_eVision

[C#]

```
string Text
  { get; set; }
```

Remarks

It is also possible to set the character value using a uint16_t code, this is done with EOCR2Char::TextCode.

EOCR2Char.TextCode

The true value of the character, this is used during the learning phase.

Namespace: Euresys.Open_eVision

[C#]

```
ushort TextCode
  { get; set; }
```

Remarks

It is also possible to set the character value using a std::string, this is done with EOCR2Char::Text.

4.172. EOCR2CharacterCluster Class

Holds all information related to character cluster.

Namespace: Euresys.Open_eVision

Properties

CharacterCount	Returns the number of characters in this cluster.
Characters	Returns all characters from this cluster.
Code	The ASCII code of the cluster.

Methods

AddCharacter	Adds a character to the cluster.
Clear	Clears the cluster.
EOCR2CharacterCluster	Constructs an EOCR2CharacterCluster context.
GetCharacter	Returns a single character from the cluster.
operator=	Copies all the data from another EOCR2CharacterCluster object into the current EOCR2CharacterCluster object
RemoveCharacter	Removes a character from the cluster.

EOCR2CharacterCluster.AddCharacter

Adds a character to the cluster.

Namespace: Euresys.Open_eVision

[C#]

```
void AddCharacter(
 Euresys.Open_eVision.EOCR2DatabaseCharacter character
 )
```

Parameters

character

The EOCR2DatabaseCharacter to be added to the database.

EOCR2CharacterCluster.CharacterCount

Returns the number of characters in this cluster.

Namespace: Euresys.Open_eVision

[C#]

```
int CharacterCount
  { get; }
```

EOCR2CharacterCluster.Characters

Returns all characters from this cluster.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2DatabaseCharacter[] Characters
  { get; }
```

EOCR2CharacterCluster.Clear

Clears the cluster.

Namespace: Euresys.Open_eVision

[C#]

```
void Clear(
 )
```

EOCR2CharacterCluster.Code

The ASCII code of the cluster.

Namespace: Euresys.Open_eVision

[C#]

```
ref ushort Code
  { get; set; }
```

EOCR2CharacterCluster.EOCR2CharacterCluster

Constructs an EOCR2CharacterCluster context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2CharacterCluster(
 )
void EOCR2CharacterCluster(
 Euresys.Open_eVision.EOCR2CharacterCluster other
 )
```

Parameters

other

EOCR2CharacterCluster object to be copied.

EOCR2CharacterCluster.GetCharacter

Returns a single character from the cluster.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2DatabaseCharacter GetCharacter(
 int index
 )
```

Parameters

index

The index of this character.

EOCR2CharacterCluster.operator=

Copies all the data from another EOCR2CharacterCluster object into the current EOCR2CharacterCluster object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2CharacterCluster operator=(
 Euresys.Open_eVision.EOCR2CharacterCluster other
 )
```

Parameters

other

EOCR2CharacterCluster object to be copied

EOCR2CharacterCluster.RemoveCharacter

Removes a character from the cluster.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveCharacter(
 int index
 )
```

Parameters

index

The index of the character to be removed.

4.173. EOCR2CharacterDatabase Class

Holds all information related to a character database.

Namespace: Euresys.Open_eVision

Properties

Characters	Returns all character from the database.

Methods

AddCharacter	Adds a single character to the database.
AddCharacters	Add characters to the database.
AddCluster	Adds the characters from an EOCR2CharacterCluster to the database
AddClusters	Adds the characters from a vector of EOCR2CharacterCluster objects to the database
ClearDatabase	Clears the database.
ClusterDatabase	Performs a clustering on the database.
EOCR2CharacterDatabase	Constructs an EOCR2CharacterDatabase context.
GetCharacter	Returns a character from the database.
operator=	Copies all the data from another EOCR2CharacterDatabase object into the current EOCR2CharacterDatabase object

RemoveCharacter	Removes a character from the database.
Save	Saves the character database to disk.

EOCR2CharacterDatabase.AddCharacter

Adds a single character to the database.

Namespace: Euresys.Open_eVision

[C#]

```
void AddCharacter(
 Euresys.Open_eVision.EOCR2DatabaseCharacter character
 )

void AddCharacter(
 Euresys.Open_eVision.EOCR2Char character
 )
```

Parameters

character

The EOCR2DatabaseCharacter or EOCR2Char to be added to the database.

EOCR2CharacterDatabase.AddCharacters

Add characters to the database.

Namespace: Euresys.Open_eVision

[C#]

```
void AddCharacters(
 Euresys.Open_eVision.EOCR2DatabaseCharacter[] characters
 )

void AddCharacters(
 string path
 )

void AddCharacters(
 string path,
 Euresys.Open_eVision.EasyOCR2CharacterFilter filter
 )

void AddCharacters(
 Euresys.Open_eVision.EOCR2Word word
 )

void AddCharacters(
 Euresys.Open_eVision.EOCR2Line line
 )
```

```
void AddCharacters(
 Euresys.Open_eVision.EOCR2Text text
 )
```

Parameters

characters

A vector of EOCR2DatabaseCharacter objects to be added to this database.

path

The path on disk of the character database to be added to this database.

filter

An EasyOCR2CharacterFilter that tells the method which subset of the character-set should be loaded.

word

An EOCR2Word object to be added to this database.

line

An EOCR2Line object to be added to this database.

text

An EOCR2Text object to be added to this database.

EOCR2CharacterDatabase.AddCluster

Adds the characters from an EOCR2CharacterCluster to the database

Namespace: Euresys.Open_eVision

[C#]

```
void AddCluster(
 Euresys.Open_eVision.EOCR2CharacterCluster cluster
 )
```

Parameters

cluster

The EOCR2CharacterCluster to be added to the database.

EOCR2CharacterDatabase.AddClusters

Adds the characters from a vector of EOCR2CharacterCluster objects to the database

Namespace: Euresys.Open_eVision

[C#]

```
void AddClusters(
 Euresys.Open_eVision.EOCR2CharacterCluster[] clusters
 )
```

Parameters

clusters

The vector of EOCR2CharacterCluster objects to be added to the database.

EOCR2CharacterDatabase.Characters

Returns all character from the database.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2DatabaseCharacter[] Characters
  { get; }
```

EOCR2CharacterDatabase.ClearDatabase

Clears the database.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearDatabase(
 )
```

EOCR2CharacterDatabase.ClusterDatabase

Performs a clustering on the database.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2CharacterCluster[] ClusterDatabase(
 int nClusters
 )
```

Parameters

nClusters

The amount of clusters to be generated.

EOCR2CharacterDatabase.EOCR2CharacterDatabase

Constructs an EOCR2CharacterDatabase context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2CharacterDatabase(
 )
void EOCR2CharacterDatabase(
 Euresys.Open_eVision.EOCR2CharacterDatabase other
 )
```

Parameters

other

EOCR2CharacterDatabase object to be copied.

EOCR2CharacterDatabase.GetCharacter

Returns a character from the database.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2DatabaseCharacter GetCharacter(
 int index
 )
```

Parameters

index

The index of the character to be returned.

EOCR2CharacterDatabase.operator=

Copies all the data from another EOCR2CharacterDatabase object into the current EOCR2CharacterDatabase object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2CharacterDatabase operator=(
 Euresys.Open_eVision.EOCR2CharacterDatabase other
 )
```

Parameters

other

EOCR2CharacterDatabase object to be copied

EOCR2CharacterDatabase.RemoveCharacter

Removes a character from the database.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveCharacter(
 int index
 )
```

Parameters

index

The index of the character to be removed.

EOCR2CharacterDatabase.Save

Saves the character database to disk.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path of the file.

serializer

The serializer.

4.174. EOCR2DatabaseCharacter Class

Holds all information related to a database character.

Namespace: Euresys.Open_eVision

Properties

Bitmap	The bitmap associated to this character.
CharacterCode	The ascii code associated to this character.

Methods

EOCR2DatabaseCharacter	Constructs an EOCR2DatabaseCharacter context.
operator=	Copies all the data from another EOCR2DatabaseCharacter object into the current EOCR2DatabaseCharacter object

EOCR2DatabaseCharacter.Bitmap

The bitmap associated to this character.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageBW8 Bitmap
  { get; }
```

EOCR2DatabaseCharacter.CharacterCode

The ascii code associated to this character.

Namespace: Euresys.Open_eVision

[C#]

```
ushort CharacterCode
  { get; set; }
```

EOCR2DatabaseCharacter.EOCR2DatabaseCharacter

Constructs an EOCR2DatabaseCharacter context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2DatabaseCharacter(
 )

void EOCR2DatabaseCharacter(
 Euresys.Open_eVision.EOCR2DatabaseCharacter other
 )
```

Parameters

other

EOCR2DatabaseCharacter object to be copied.

EOCR2DatabaseCharacter.operator=

Copies all the data from another EOCR2DatabaseCharacter object into the current EOCR2DatabaseCharacter object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2DatabaseCharacter operator=(
 Euresys.Open_eVision.EOCR2DatabaseCharacter other
 )
```

Parameters

other

EOCR2DatabaseCharacter object to be copied

4.175. EOCR2Line Class

Holds a vector of EOCR2Word objects representing a line.

Namespace: Euresys.Open_eVision

Properties

BoundingBox	The bounding box encapsulating all characters in the line.
Text	The true value of all characters in the line.
Words	The vector of EOCR2Word objects representing the line.

Methods

EOCR2Line	Constructs an EOCR2Line context.
operator=	Copies all the data from another EOCR2Line object into the current EOCR2Line object

EOCR2Line.BoundingBox

The bounding box encapsulating all characters in the line.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERectangle BoundingBox
  { get; }
```

EOCR2Line.EOCR2Line

Constructs an EOCR2Line context.

Namespace: Euresys.Open_eVision

```
[C#]
void EOCR2Line(
 )
void EOCR2Line(
 Euresys.Open_eVision.EOCR2Line other
 )
```

Parameters

other

EOCR2Line object to be copied.

EOCR2Line.operator=

Copies all the data from another EOCR2Line object into the current EOCR2Line object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2Line operator=(
 Euresys.Open_eVision.EOCR2Line other
 )
```

Parameters

other

EOCR2Line object to be copied

EOCR2Line.Text

The true value of all characters in the line.

Namespace: Euresys.Open_eVision

```
[C#]
string Text
  { get; set; }
```

Remarks

Use a space to separate two words.

EOCR2Line.Words

The vector of EOCR2Word objects representing the line.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EOCR2Word[] Words
  { get; set; }
```

4.176. EOCR2Text Class

Holds a vector of EOCR2Line objects representing a text.

Namespace: Euresys.Open_eVision

Properties

BoundingBox	The bounding box encapsulating all characters in the text.
Lines	The vector of EOCR2Line objects representing the text.
Text	The true value of all characters in the text.

Methods

EOCR2Text	Constructs an EOCR2Text context.
operator=	Copies all the data from another EOCR2Text object into the current EOCR2Text object

EOCR2Text.BoundingBox

The bounding box encapsulating all characters in the text.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERectangle BoundingBox
  { get; }
```

EOCR2Text.EOCR2Text

Constructs an EOCR2Text context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2Text(
 )
void EOCR2Text(
 Euresys.Open_eVision.EOCR2Text other
 )
```

Parameters

other

EOCR2Text object to be copied.

Remarks

Default and copy constructors.

EOCR2Text.Lines

The vector of EOCR2Line objects representing the text.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Line[] Lines
  { get; set; }
```

EOCR2Text.operator=

Copies all the data from another EOCR2Text object into the current EOCR2Text object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Text operator=(
 Euresys.Open_eVision.EOCR2Text other
 )
```

Parameters

other

EOCR2Text object to be copied

EOCR2Text.Text

The true value of all characters in the text.

Namespace: Euresys.Open_eVision

[C#]

```
string Text
  { get; set; }
```

Remarks

Use a space (" ") to separate two words and a linebreak ("\n") to separate two lines.

4.177. EOCR2Word Class

Holds a vector of EOCR2Char objects representing a word.

Namespace: Euresys.Open_eVision

Properties

BoundingBox	The bounding box of the word, encapsulating all characters in the word.
Characters	The vector of EOCR2Char objects representing the word.
Text	The true value of all characters in the word.

Methods

EOCR2Word	Constructs an EOCR2Word context.
operator=	Copies all the data from another EOCR2Word object into the current EOCR2Word object

EOCR2Word.BoundingBox

The bounding box of the word, encapsulating all characters in the word.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangle BoundingBox
  { get; }
```

EOCR2Word.Characters

The vector of EOCR2Char objects representing the word.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Char[] Characters
  { get; set; }
```

EOCR2Word.EOCR2Word

Constructs an EOCR2Word context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2Word(
 )
void EOCR2Word(
 Euresys.Open_eVision.EOCR2Word other
 )
```

Parameters

other

EOCR2Word object to be copied.

EOCR2Word.operator=

Copies all the data from another EOCR2Word object into the current EOCR2Word object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EOCR2Word operator=(
 Euresys.Open_eVision.EOCR2Word other
 )
```

Parameters

other

EOCR2Word object to be copied

EOCR2Word.Text

The true value of all characters in the word.

Namespace: Euresys.Open_eVision

[C#]

```
string Text
```

```
{ get; set; }
```

4.178. EPathVector Class

Vector objects are used to store 1-dimensional data.

Remarks

Using vectors is very similar to using 1-dimensional arrays, except that the size can vary at runtime. Memory allocation is handled internally. * To create a vector, use its constructor. * To fill a vector with values, first empty it, using the EPathVector member, and then add elements one at time at the tail by calling the EPathVector::AddElement member. * To access a vector element, either for reading or writing, use the [] operator. * To inquire for the current number of elements, use member EPathVector.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

Closed	Flag indicating whether the shape built with EasyImage::Contour must be closed or not.
RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
Draw	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
DrawClosedContour	Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.
DrawWithCurrentPen	Draws the path. By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).
EPathVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.

operator=	Copies all the data from another EPathVector object into the current EPathVector object
SetElement	Modifies the vector element at the given index by the given value.

EPathVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 Euresys.Open_eVision.EPath element
 )
```

Parameters

element

The element to be added.

EPathVector.Closed

Flag indicating whether the shape built with EasyImage::Contour must be closed or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool Closed
  { get; set; }
```

EPathVector.Draw

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPathVectorDrawOption drawOption,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

drawOption

Option for how to draw the path vector

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPathVector.DrawClosedContour

Draws the path vector as the closed contour of an object or a blob. The contour mode used to compute the path must be passed as argument to draw the contour correctly. This method only supports the closed contour modes ClockwiseAlwaysClosed and AnticlockwiseAlwaysClosed.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawClosedContour(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EContourMode contourMode,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

contourMode

Contour mode used to get this path vector used to draw the external boundary of the contour.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

EPathVector.DrawWithCurrentPen

This method is deprecated.

Draws the path.
By default, the path is drawn by connecting the centers of all the pixels in the path. Using the drawOption argument, you can also connect all the top left corners of the pixels (EPathVectorDrawOption_TopLeft) in the path or fill all the pixels in the path (EPathVectorDrawOption_Fill).

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Zooming factor along the X axis (1.0f means no zoom).

zoomY

Zooming factor along the Y axis (1.0f means no zoom).

originX

Abscissa of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

originY

Ordinate of the upper left corner of the plot's bounding rectangle, in pixels. By default, the upper left corner of the window is used.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPathVector.EPathVector

Constructs a vector.

Namespace: Euresys.Open_eVision

```
[C#]
void EPathVector(
 )

void EPathVector(
 uint maxNumberOfElements
 )
```

```
void EPathVector(
 Euresys.Open_eVision.EPathVector other
 )
```

Parameters

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

other

EPathVector object to be copied

EPathVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPath GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EPathVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EPathVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EPath operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EPathVector (excluded) of the element to be accessed.

EPathVector.operator=

Copies all the data from another EPathVector object into the current EPathVector object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPathVector operator=(
 Euresys.Open_eVision.EPathVector other
 )
```

Parameters

other

EPathVector object to be copied

EPathVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

```
[C#]
IntPtr RawDataPtr
  { get; }
```

EPathVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

```
[C#]
void SetElement(
 int index,
 Euresys.Open_eVision.EPath value
 )
```

Parameters

index

Index, between 0 and EPathVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.179. EPatternFinder Class

Manages a complete finding context in EasyFind.

Namespace: Euresys.Open_eVision

Properties

AngleBias	Angle bias, expressed in the current angle unit.
AngleSearchExtent	The angular extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.
AngleTolerance	Angle tolerance, expressed in the current angle unit.
ContrastMode	Contrast of the instance, as defined in EFindContrastMode.
FeaturePoints	The features points used by the model
FindExtension	Extension value, that is the pattern margin size (in pixels) that is allowed to go out of the search field.
Interpolate	Whether interpolation is performed when searching for a pattern occurrence.
LearningDone	Indicates whether a pattern has already been learned.
LightBalance	Light balance, between [-1.0, 1.0].
LocalSearchMode	Sets the local search mode.
MaxFeaturePoints	Maximum number of feature points at the fine stage.
MaxInitialCandidates	Maximum number of initial candidates.
MaxInstances	Maximum number of instances to be found.
MaxOverlap	Overlapping tolerance
MinFeaturePoints	Minimum number of feature points at the coarse stage.
MinScore	Minimum score of found instances, between [-1.0, 1.0].
PatternType	Pattern type, as defined in EPatternType.
Pivot	Reference point in the model.
PointShape	Get the point shape associated with the EPatternFinder.
ReductionMode	The reduction mode that is to be used when learning the model (automatic or manual), as defined in EReductionMode.
ReductionStrength	The reduction strength that is to be used when learning the model, between 0 and 1.
ScaleBias	Scale bias, expressed in units (not in percent).

ScaleSearchExtent	The scaling extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.
ScaleTolerance	Scale tolerance, expressed in units (not in percent).
ThinStructureMode	Mode for ThinStructure, as defined in EThinStructureMode.
XSearchExtent	The X-axis extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.
YSearchExtent	The Y-axis extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.

Methods

CopyLearntPattern	Copies the learned pattern in the supplied image. If no pattern has been learned, an exception with code NoPatternLearnt will be thrown.
DrawModel	Draws the model features with an overlay in image coordinates.
DrawModelWithCurrentPen	Draws the model features with an overlay in image coordinates.
EPatternFinder	Constructs a EPatternFinder context.
Find	Locates a set of possible occurrences of the learned pattern in the supplied search field.
Learn	Learns a given pattern and stores it in the EPatternFinder object.
Load	Loads an EPatternFinder.The given EPatternFinder must have been created for reading.
operator=	-
Save	Loads an EPatternFinder.The given EPatternFinder must have been created for writing.

EPatternFinder.AngleBias

Angle bias, expressed in the current angle unit.

Namespace: Euresys.Open_eVision

```
[C#]
float AngleBias
  { get; set; }
```

Remarks

The AngleBias defines the angle offset between the model and the instances. Finding the pattern is performed in range AngleBias +/- EPatternFinder::AngleTolerance. This range should not exceed a full turn. Default: 0.0.

EPatternFinder.AngleSearchExtent

The angular extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.

Namespace: Euresys.Open_eVision

[C#]

```
int AngleSearchExtent
  { get; set; }
```

EPatternFinder.AngleTolerance

Angle tolerance, expressed in the current angle unit.

Namespace: Euresys.Open_eVision

[C#]

```
float AngleTolerance
  { get; set; }
```

Remarks

The AngleTolerance defines the angle allowance of the instances around the EPatternFinder::AngleBias. Finding the pattern is performed in range EPatternFinder::AngleBias +/- AngleTolerance. This range should not exceed a full turn. A NULL tolerance can be set, in which case the angle bias value is assumed. Default: 0.0.

EPatternFinder.ContrastMode

Contrast of the instance, as defined in EFindContrastMode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFindContrastMode ContrastMode
  { get; set; }
```

Remarks

This is a ConsistentEdges pattern type property. It defines the contrast of regions. Contrast can be normal (as in the model), inverse (inverse contrast of the model), or any (same or inverse contrast of the model). Default: Normal.

EPatternFinder.CopyLearntPattern

Copies the learned pattern in the supplied image. If no pattern has been learned, an exception with code NoPatternLearnt will be thrown.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyLearntPattern(
 Euresys.Open_eVision.EImageBW8 image
 )
```

Parameters

image

Pointer to the image in which the learned pattern will be returned.

EPatternFinder.DrawModel

Draws the model features with an overlay in image coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawModel(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawModel(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawModel(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination windows.

zoomX

Horizontal zooming factor.

zoomY

Vertical zooming factor. If set to 0, the horizontal zooming factor will be used for isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPatternFinder.DrawModelWithCurrentPen

This method is deprecated.

Draws the model features with an overlay in image coordinates.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawModelWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination windows.

zoomX

Horizontal zooming factor.

zoomY

Vertical zooming factor. If set to 0, the horizontal zooming factor will be used for isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPatternFinder.EPatternFinder

Constructs a EPatternFinder context.

Namespace: Euresys.Open_eVision

[C#]

```
void EPatternFinder(
 )

void EPatternFinder(
 Euresys.Open_eVision.EPatternFinder other
 )
```

Parameters

other

Another EPatternFinder object to be copied in the new EPatternFinder object.

Remarks

All properties are initialized to their respective default values.

EPatternFinder.FeaturePoints

The features points used by the model

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFindFeaturePoint[] FeaturePoints
  { get; }
```

EPatternFinder.Find

Locates a set of possible occurrences of the learned pattern in the supplied search field.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFoundPattern[] Find(
 Euresys.Open_eVision.EROIBW8 source
 )
Euresys.Open_eVision.EFoundPattern[] Find(
 Euresys.Open_eVision.EROIBW8 source,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

source

Image or part of an image in which the learned model has to be searched for.

region

Region into the ROI where the search is performed.

Remarks

This method will fail if no pattern has been learned previously. The result is a vector of EFoundPattern objects.

EPatternFinder.FindExtension

Extension value, that is the pattern margin size (in pixels) that is allowed to go out of the search field.

Namespace: Euresys.Open_eVision

[C#]

```
int FindExtension
  { get; set; }
```

Remarks

When a non-NULL value is attributed to the extension, the detection of instances partially out of the ROI is allowed. The extension value defines how much the ROI is extended. Default: 0.

EPatternFinder.Interpolate

Whether interpolation is performed when searching for a pattern occurrence.

Namespace: Euresys.Open_eVision

[C#]

```
bool Interpolate
  { get; set; }
```

Remarks

By default, matching is done with a one-pixel precision for all degrees of freedom (translation, rotation and scaling). You can use an additional interpolation process to achieve sub-pixel accuracy. This generally leads to an improvement of the sub-pixel accuracy by a factor larger than 10. This is possible only when the found instances match closely the model. A score higher than 0.99 indicates that the instances are a close match of the model. In other words, the instance is considered to be more accurate when the score is higher. The added computational cost is low. Default: true.

EPatternFinder.Learn

Learns a given pattern and stores it in the EPatternFinder object.

Namespace: Euresys.Open_eVision

```
[C#]
void Learn(
 Euresys.Open_eVision.EROIBW8 pattern,
 Euresys.Open_eVision.EROIBW8 dontCare
 )
void Learn(
 Euresys.Open_eVision.EROIBW8 pattern,
 Euresys.Open_eVision.ERegion region
 )
void Learn(
 Euresys.Open_eVision.EVectorModel model
 )
```

Parameters

pattern

Model to be learned (ROI).

dontCare

"Don't care" area mask (ROI).

region

Region into the ROI where the learning is performed

model

-

Remarks

Learning another pattern erases the information stored for the first one. A "don't care area" can be set as argument, allowing to mask and not take into account certain parts of the pattern while learning. The "don't care area" mask should have the same size as the pattern or as its eventual parent image. The mask should be a bi-level image with pixel - values of '0' for ignored areas and '255' otherwise.

EPatternFinder.LearningDone

Indicates whether a pattern has already been learned.

Namespace: Euresys.Open_eVision

```
[C#]
bool LearningDone
  { get; }
```

EPatternFinder.LightBalance

Light balance, between [-1.0, 1.0].

Namespace: Euresys.Open_eVision

```
[C#]
float LightBalance
  { get; set; }
```

Remarks

In the ConsistentEdges and ThinStructure modes, the LightBalance property governs the selection of the feature points while learning the model. It drives which edge points are eligible as feature points in the model, by defining a criterion for ignoring those edge points that are not sharp enough. As a consequence, this property will influence the spatial distribution of the feature points. In the aforementioned operating modes, the feature points are the places in the image that exhibit a strong variation in the gray level signal. Mathematically, these places are those at which the magnitude of the gradient is significant. The LightBalance property defines the way the latter threshold on the magnitude of the gradient is computed, through a careful analysis of the dynamics of gradient. The more the LightBalance tends to -1, the more tolerant will be the threshold, and the more edge points will be considered as candidates for becoming feature points. Conversely, as the LightBalance property becomes close to 1, only the points with a high gradient magnitude are taken into consideration. In other words, a small LightBalance defines a loose criterion for defining what an edge point is, whereas a great value implies a conservative criterion. By default, this property is fixed to 0.0. This is an appropriate value for most images which are encountered in industrial machine vision. The LightBalance is automatically set to 0.0 after a learning process. Once the LightBalance is changed, a new learning process has to be done to take the new value into account. An efficient way to see the effect of changing this property is to use the EPatternFinder::DrawModel method.

EPatternFinder.Load

Loads an EPatternFinder.The given EPatternFinder must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path,
 bool daughters
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer,
 bool daughters
 )
```

Parameters

path

The file path.

daughters

Indicates if the load must be done on the whole hierarchy or just this object.

serializer

Pointer to the ESerializer created for reading.

EPatternFinder.LocalSearchMode

Sets the local search mode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ELocalSearchMode LocalSearchMode
  { get; set; }
```

Remarks

In the multi-stage approach of EasyFind, pattern occurrence candidates are at first found at the coarsest stage. Then, at each of the following stages, their position and score are refined until the last and finest one. This refining is achieved by searching for better candidates in the neighborhood of each of the ones found in the previous stage. The local search mode allows the user to set the extent of this neighborhood. By default, the local search mode is set to Basic.

EPatternFinder.MaxFeaturePoints

Maximum number of feature points at the fine stage.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxFeaturePoints
  { get; set; }
```

Remarks

Default: 1024. Reserved use.

EPatternFinder.MaxInitialCandidates

Maximum number of initial candidates.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxInitialCandidates
  { get; set; }
```

Remarks

During the search for matching patterns, EasyFind considers a set of candidates that it progressively refines. The maximum number of initial candidates must be greater or equal than the number of instances to be found (see EPatternFinder::MaxInstances). A large number of initial candidates can help finding difficult or partial match but at the cost of increasing processing time. A small number can help speeding up the find process. By default, the value for maximum number of initial candidates is 0, indicating that the value is chosen internally.

EPatternFinder.MaxInstances

Maximum number of instances to be found.

Namespace: Euresys.Open_eVision

[C#]

```
uint MaxInstances
  { get; set; }
```

Remarks

Default: 1.

EPatternFinder.MaxOverlap

Overlapping tolerance

Namespace: Euresys.Open_eVision

[C#]

```
float MaxOverlap
  { get; set; }
```

Remarks

0.0 means all found patterns must be disconnected, 1.0 means they can fully overlap. Default: 1.0.

EPatternFinder.MinFeaturePoints

Minimum number of feature points at the coarse stage.

Namespace: Euresys.Open_eVision

```
[C#]
uint MinFeaturePoints
  { get; set; }
```

Remarks

Default: 8. Reserved use.

EPatternFinder.MinScore

Minimum score of found instances, between [-1.0, 1.0].

Namespace: Euresys.Open_eVision

```
[C#]
float MinScore
  { get; set; }
```

Remarks

Instances with a score under the MinScore will not be returned.

EPatternFinder.operator=

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPatternFinder operator=(
 Euresys.Open_eVision.EPatternFinder other
 )
```

Parameters

other

-

EPatternFinder.PatternType

Pattern type, as defined in EPatternType.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPatternType PatternType
  { get; set; }
```

Remarks

This property informs the EPatternFinder of the general nature of the model to be learned. Default: ConsistentEdges.

EPatternFinder.Pivot

Reference point in the model.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Pivot
  { get; set; }
```

Remarks

The coordinates of the reference point are relative to the upper left corner of the model. The location of an instance (Coordinates (X,Y)) is the location of its reference point defined in the model. By default, the pivot is a EPoint set to the pattern center. EPoint is a structure that contains two x and y float values.

EPatternFinder.PointShape

Get the point shape associated with the EPatternFinder.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPointShape PointShape
  { get; }
```

EPatternFinder.ReductionMode

The reduction mode that is to be used when learning the model (automatic or manual), as defined in EReductionMode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EReductionMode ReductionMode
  { get; set; }
```

Remarks

Specifies whether the best-guess method should be used to assert the level of reduction that will be used when learning the model. If this property is set to Manual, it is up to the user to provide a suitable reduction strength. This value is only used when learning the model. Default: Auto, which means that the best-guess algorithm is used by default.

EPatternFinder.ReductionStrength

The reduction strength that is to be used when learning the model, between 0 and 1.

Namespace: Euresys.Open_eVision

[C#]

```
float ReductionStrength
  { get; set; }
```

Remarks

Specifies the reduction strength for learning the model (encoded as a percentage). Its precise semantics depends on the reduction mode (see the EPatternFinder::ReductionMode property): * In the automatic reduction mode, its value is undefined until a model is learned. When a model is learned (i.e. after a call to EPatternFinder::Learn), the value of this property can be read, in which case it reflects the reduction strength that has been automatically chosen by the best-guess algorithm. * In the manual reduction mode, this property must be set by the user and is kept constant throughout the entire lifetime of the object. The new value of the property is only used at the following call to EPatternFinder::Learn. This value only has an effect when learning the model. Default: The default value depends on the value of the EPatternFinder::ReductionMode property. Allowed values: Floating-point number in the interval [0..1].

EPatternFinder.Save

Loads an EPatternFinder.The given EPatternFinder must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path,
 bool daughters
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer,
 bool daughters
 )
```

Parameters

path

The file path.

daughters

Indicates if the save must be done on the whole hierarchy or just this object.

serializer

Pointer to the ESerializer created for writing.

EPatternFinder.ScaleBias

Scale bias, expressed in units (not in percent).

Namespace: Euresys.Open_eVision

[C#]

```
float ScaleBias
  { get; set; }
```

Remarks

The ScaleBias defines the scale factor between the model and the instances. Finding the pattern is performed in range ScaleBias +/- ScaleTolerance. This range should not exceed [0.5..2.5] (50 % to 250 % scaling). Default: 1.0 (100 %).

EPatternFinder.ScaleSearchExtent

The scaling extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.

Namespace: Euresys.Open_eVision

[C#]

```
int ScaleSearchExtent
  { get; set; }
```

EPatternFinder.ScaleTolerance

Scale tolerance, expressed in units (not in percent).

Namespace: Euresys.Open_eVision

[C#]

```
float ScaleTolerance
  { get; set; }
```

Remarks

The ScaleTolerance defines the scale allowance of the instances around the EPatternFinder::ScaleBias. Finding the pattern is performed in range EPatternFinder::ScaleBias +/- ScaleTolerance. This range should not exceed [0.5..2] (50 % to 200 % scaling). A NULL tolerance can be set, in which case the scale bias value is assumed. Default: 0.0.

EPatternFinder.ThinStructureMode

Mode for ThinStructure, as defined in EThinStructureMode.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EThinStructureMode ThinStructureMode
  { get; set; }
```

Remarks

EThinStructureMode informs EasyFind if thin elements in the model are darker or brighter than regions. Default: Auto, which detects the best mode between dark or bright.

EPatternFinder.XSearchExtent

The X-axis extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.

Namespace: Euresys.Open_eVision

[C#]

```
int XSearchExtent
  { get; set; }
```

EPatternFinder.YSearchExtent

The Y-axis extension of the search neighborhood. Only odd values are allowed for this parameter. See the EPatternFinder::LocalSearchMode property description for further details.

Namespace: Euresys.Open_eVision

[C#]

```
int YSearchExtent
```

```
{ get; set; }
```

4.180. EPeakVector Class

Represents a vector of profile peaks.

Base Class:EVector

Namespace: Euresys.Open_eVision

Properties

RawDataPtr	Pointer to the vector data.

Methods

AddElement	Appends (adds at the tail) an element to the vector.
EPeakVector	Constructs a vector.
GetElement	Returns the vector element at the given index.
operator[]	Gives access to the vector element at the given index.
operator=	Copies all the data from another EPeakVector object into the current EPeakVector object
SetElement	Modifies the vector element at the given index by the given value.

EPeakVector.AddElement

Appends (adds at the tail) an element to the vector.

Namespace: Euresys.Open_eVision

```
[C#]
void AddElement(
 Euresys.Open_eVision.EPeak element
 )
```

Parameters

element

The element to be added.

EPeakVector.EPeakVector

Constructs a vector.

Namespace: Euresys.Open_eVision

[C#]

```
void EPeakVector(
 )
void EPeakVector(
 Euresys.Open_eVision.EPeakVector other
 )
void EPeakVector(
 uint maxNumberOfElements
 )
```

Parameters

other

EPeakVector object to be copied

maxNumberOfElements

Optionally, memory can be pre-allocated to accommodate a given number of elements.

EPeakVector.GetElement

Returns the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPeak GetElement(
 int index
 )
```

Parameters

index

Index, between 0 and EPeakVector (excluded) of the element to be accessed.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

EPeakVector.operator[]

Gives access to the vector element at the given index.

Namespace: Euresys.Open_eVision

[C#]

```
ref Euresys.Open_eVision.EPeak operator[](
 uint index
 )
```

Parameters

index

Index, between 0 and EPeakVector (excluded) of the element to be accessed.

EPeakVector.operator=

Copies all the data from another EPeakVector object into the current EPeakVector object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPeakVector operator=(
 Euresys.Open_eVision.EPeakVector other
 )
```

Parameters

other

EPeakVector object to be copied

EPeakVector.RawDataPtr

Pointer to the vector data.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr RawDataPtr
  { get; }
```

EPeakVector.SetElement

Modifies the vector element at the given index by the given value.

Namespace: Euresys.Open_eVision

[C#]

```
void SetElement(
 int index,
 Euresys.Open_eVision.EPeak value
 )
```

Parameters

index

Index, between 0 and EPeakVector (excluded), of the element to be modified.

value

The new value for the element.

Remarks

If the given index is outside the bounds of the vector, the error code Parameter1OutOfRange is set.

4.181. EPhotometricStereoImager Class

Manages photometric stereo reconstruction. This class can build normals, albedos, gradients, mean curvatures and gaussian curvatures images from at least 3 input images by using photometric stereo The algorithm used assumes objects are Lambertian and light sources emit parallel rays

Namespace: Euresys.Open_eVision.Easy3D

Properties

CalibrationAzimuthAngles	Gets the calibration azimuth angles.
CalibrationElevationAngles	Gets the calibration elevation angles.
EnableNonUniformLightingCorrection	Gets/Sets whether the correction of the non uniformity of the lighting is corrected or not (disabled by default, enabled by calling EPhotometricStereoImager::ConfigureNonUniformLightingCorrection). Disabling it increases speed.
GradientsX	Gets the gradients on the X axis as an EImageBW8.
GradientsY	Gets the gradients on the Y axis as an EImageBW8.
Normals	Gets the normals as an EImageC24.

Methods

CalibrateFromSphere	Calibrates the light directions on several images (at least 3) of a sphere (or half sphere) and returns a score indicating the reliability of the calibration.
Compute	Compute the different photometric stereo images of an object. To retrieve them, see EPhotometricStereoImager::Normals, EPhotometricStereoImager::GetAlbedos, EPhotometricStereoImager::GradientsX, EPhotometricStereoImager::GradientsY, EPhotometricStereoImager::ComputeGaussianCurvatures and EPhotometricStereoImager::ComputeMeanCurvatures.

ComputeGaussianCurvatures	Computes the gaussian curvatures as an EImageBW8. Gaussian curvatures are inherently floating point images so a conversion must be specified. In all cases, a floating point value of 0 translates to an EBW8 value of 128. See EPhotometricStereoContrast for the different conversions.
ComputeHeightMap	Computes the height at each pixel as an EZMap8 by integrating the surface gradients.
ComputeMeanCurvatures	Computes the mean curvatures as an EImageBW8. Mean curvatures are inherently floating point images so a conversion must be specified. In all cases, a floating point value of 0 translates to an EBW8 value of 128. See EPhotometricStereoContrast for the different conversions.
ConfigureNonUniformLightingCorrection	Configure the non uniform lighting correction of the scene by using flat images. Photometric stereo assumes the lights of each image to be of same direction and intensity. This is however rarely the case in practice, a way to attenuate the problem is to use flat images to correct non-uniform lighting before performing photometric stereo.
EPhotometricStereoImager	Creates an EPhotometricStereoImager object.
GetAlbedos	Gets the albedos as an EImageBW8. Albedos are inherently floating point images so a conversion must be specified. In all cases, a floating point value of 0 translates to an EBW8 value of 0.
GetCalibrationAngles	Gets the calibration angles.
Load	Loads the EPhotometricStereoImager. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the EPhotometricStereoImager. The given ESerializer must have been created for writing.
SetCalibrationAngles	Sets the calibration angles

EPhotometricStereoImager.CalibrateFromSphere

Calibrates the light directions on several images (at least 3) of a sphere (or half sphere) and returns a score indicating the reliability of the calibration.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float CalibrateFromSphere(
 Euresys.Open_eVision.ERoiBW8[] sphereImages
 )

float CalibrateFromSphere(
 Euresys.Open_eVision.ERoiBW8[] sphereImages,
 Euresys.Open_eVision.ERoiBW8 darkImage
 )
```

```
float CalibrateFromSphere(
 Euresys.Open_eVision.EROIBW8[] sphereImages,
 Euresys.Open_eVision.ECircle circle
 )

float CalibrateFromSphere(
 Euresys.Open_eVision.EROIBW8[] sphereImages,
 Euresys.Open_eVision.EROIBW8 darkImage,
 Euresys.Open_eVision.ECircle circle
 )

float CalibrateFromSphere(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4
 )

float CalibrateFromSphere(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4,
 Euresys.Open_eVision.EROIBW8 darkImage
 )

float CalibrateFromSphere(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4,
 Euresys.Open_eVision.ECircle circle
 )

float CalibrateFromSphere(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4,
 Euresys.Open_eVision.EROIBW8 darkImage,
 Euresys.Open_eVision.ECircle circle
 )
```

Parameters

sphereImages

A vector of EROIBW8 of a sphere.

darkImage

An image of the object when there is no specific illumination. This argument can help to improve the calibration especially if the image is not dark when there is no illumination. Otherwise, it is not useful.

circle

An ECircle that represents the position of the sphere. Default: automatically computed.

image1

The first EROIBW8 of a sphere in a 4-image configuration.

image2

The second EROIBW8 of a sphere in a 4-image configuration.

image3

The third EROIBW8 of a sphere in a 4-image configuration.

image4

The fourth EROIBW8 of a sphere in a 4-image configuration.

EPhotometricStereoImager.CalibrationAzimuthAngles

Gets the calibration azimuth angles.

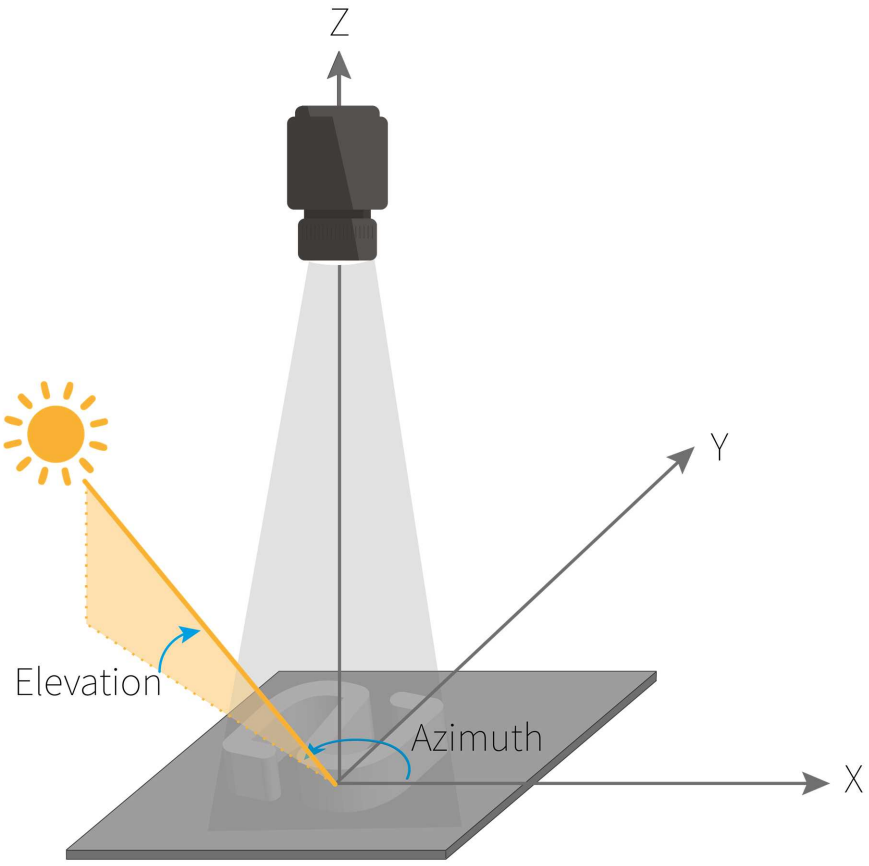
Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float[] CalibrationAzimuthAngles
  { get; }
```

Remarks

When facing the image, the axis x points right, y points top and z points towards the camera. Azimuth angles are oriented trigonometrically around the z axis. A light source on the right of the image would have an azimuth of 0 degrees. One on top would have an azimuth of 90 degrees.



EPhotometricStereoImager.CalibrationElevationAngles

Gets the calibration elevation angles.

Namespace: Euresys.Open_eVision.Easy3D

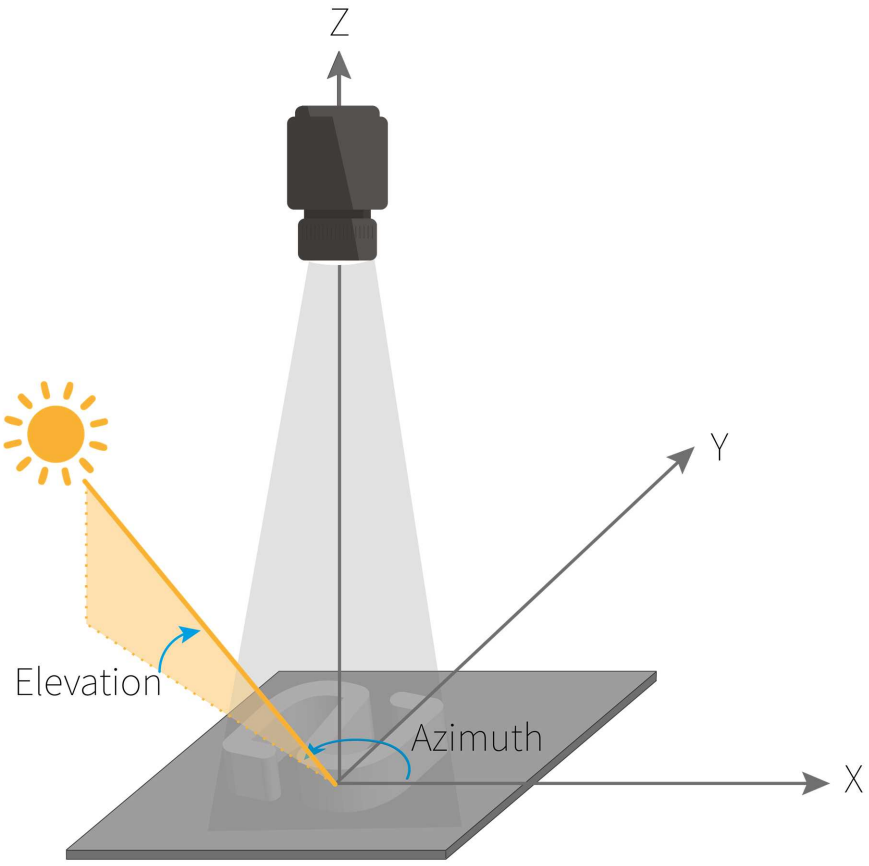
[C#]

```
float[] CalibrationElevationAngles
```

```
{ get; }
```

Remarks

When facing the image, the axis x points right, y points top and z points towards the camera. Elevation is the angle formed by the base plane and the light source. A light source on the horizon would have an elevation of 0 degrees. One on the camera would have an elevation of 90 degrees.



EPhotometricStereoImager.Compute

Compute the different photometric stereo images of an object. To retrieve them, see EPhotometricStereoImager::Normals, EPhotometricStereoImager::GetAlbedos, EPhotometricStereoImager::GradientsX, EPhotometricStereoImager::GradientsY, EPhotometricStereoImager::ComputeGaussianCurvatures and EPhotometricStereoImager::ComputeMeanCurvatures.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Compute(
 Euresys.Open_eVision.EROIBW8[] objectImages
 )
void Compute(
 Euresys.Open_eVision.EROIBW8[] objectImages,
 Euresys.Open_eVision.ERegion region
 )
void Compute(
 Euresys.Open_eVision.EROIBW8[] objectImages,
 Euresys.Open_eVision.EROIBW8 darkImage
 )
void Compute(
 Euresys.Open_eVision.EROIBW8[] objectImages,
 Euresys.Open_eVision.EROIBW8 darkImage,
 Euresys.Open_eVision.ERegion region
 )
void Compute(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4
 )
void Compute(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4,
 Euresys.Open_eVision.ERegion region
 )
void Compute(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4,
 Euresys.Open_eVision.EROIBW8 darkImage
 )
void Compute(
 Euresys.Open_eVision.EROIBW8 image1,
 Euresys.Open_eVision.EROIBW8 image2,
 Euresys.Open_eVision.EROIBW8 image3,
 Euresys.Open_eVision.EROIBW8 image4,
 Euresys.Open_eVision.EROIBW8 darkImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

objectImages

A vector of EROIBW8 of the object to reconstruct. The images must be in the same order as the calibration images/angles with respect to the light direction. If flat images are used, flat and object images must have the same size

region

ERegion within which the computation will be done.

darkImage

An image of the object when there is no specific illumination. This argument can help to improve the results especially if the image is not dark when there is no illumination. Otherwise, it is not useful.

image1

The first EROIBW8 of the object in a 4-image configuration.

image2

The second EROIBW8 of the object in a 4-image configuration.

image3

The third EROIBW8 of the object in a 4-image configuration.

image4

The fourth EROIBW8 of the object in a 4-image configuration.

EPhotometricStereoImager.ComputeGaussianCurvatures

Computes the gaussian curvatures as an EImageBW8. Gaussian curvatures are inherently floating point images so a conversion must be specified. In all cases, a floating point value of 0 translates to an EBW8 value of 128. See EPhotometricStereoContrast for the different conversions.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW8 ComputeGaussianCurvatures(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoContrast contrast
 )

Euresys.Open_eVision.EImageBW8 ComputeGaussianCurvatures(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoContrast contrast,
 float maxAbsoluteValue
 )
```

Parameters

contrast

an EPhotometricStereoContrast

maxAbsoluteValue

when contrast is EPhotometricStereoContrast_FixedRange, this parameter can be used to specify the maximal floating point value for the gaussian curvatures, otherwise it is ignored. All values outside of [-maxAbsoluteValue, +maxAbsoluteValue] are clipped. maxAbsoluteValue must be positive and defaults to 2.

Remarks

Both gaussian and mean curvatures are computed in this method and are cached to avoid unnecessary computations.

EPhotometricStereoImager.ComputeHeightMap

Computes the height at each pixel as an EZMap8 by integrating the surface gradients.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EZMap8 ComputeHeightMap(
 )
```

EPhotometricStereoImager.ComputeMeanCurvatures

Computes the mean curvatures as an EImageBW8. Mean curvatures are inherently floating point images so a conversion must be specified. In all cases, a floating point value of 0 translates to an EBW8 value of 128. See EPhotometricStereoContrast for the different conversions.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW8 ComputeMeanCurvatures(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoContrast contrast
 )

Euresys.Open_eVision.EImageBW8 ComputeMeanCurvatures(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoContrast contrast,
 float maxAbsoluteValue
 )
```

Parameters

contrast

an EPhotometricStereoContrast

maxAbsoluteValue

when contrast is EPhotometricStereoContrast_FixedRange, this parameter can be used to specify the maximal floating point value for the mean curvatures, otherwise it is ignored. All values outside of [-maxAbsoluteValue, +maxAbsoluteValue] are clipped. maxAbsoluteValue must be positive and defaults to 3.

Remarks

Both mean and gaussian curvatures are computed in this method and are cached to avoid unnecessary computations.

EPhotometricStereoImager.ConfigureNonUniformLightingCorrection

Configure the non uniform lighting correction of the scene by using flat images. Photometric stereo assumes the lights of each image to be of same direction and intensity. This is however rarely the case in practice, a way to attenuate the problem is to use flat images to correct non-uniform lighting before performing photometric stereo.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ConfigureNonUniformLightingCorrection(
 Euresys.Open_eVision.EROIBW8[] flatImages
 )

void ConfigureNonUniformLightingCorrection(
 Euresys.Open_eVision.EROIBW8[] flatImages,
 Euresys.Open_eVision.EROIBW8 darkImage
 )
```

Parameters

flatImages

A vector of EROIBW8 of the flat images. The images must be in the same order as the calibration images/angles with respect to the light direction.

darkImage

An image of the object when there is no specific illumination. This argument can help to improve the results especially if the image is not dark when there is no illumination. Otherwise, it is not useful.

EPhotometricStereoImager.EnableNonUniformLightingCorrection

Gets/Sets whether the correction of the non uniformity of the lighting is corrected or not (disabled by default, enabled by calling EPhotometricStereoImager::ConfigureNonUniformLightingCorrection). Disabling it increases speed.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableNonUniformLightingCorrection
  { get; set; }
```

Remarks

It must be configured (EPhotometricStereoImager::ConfigureNonUniformLightingCorrection) before being enabled.

EPhotometricStereoImager.EPhotometricStereoImager

Creates an EPhotometricStereoImager object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EPhotometricStereoImager(
 )
void EPhotometricStereoImager(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoImager other
 )
```

Parameters

other

Another EPhotometricStereoImager.

EPhotometricStereoImager.GetAlbedos

Gets the albedos as an EImageBW8. Albedos are inherently floating point images so a conversion must be specified. In all cases, a floating point value of 0 translates to an EBW8 value of 0.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW8 GetAlbedos(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoContrast contrast
 )
Euresys.Open_eVision.EImageBW8 GetAlbedos(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoContrast contrast,
 float maxValue
 )
```

Parameters

contrast

an EPhotometricStereoContrast

maxValue

when contrast is EPhotometricStereoContrast_FixedRange, this parameter can be used to specify the maximal floating point value for the albedos, otherwise it is ignored. All values bigger than the parameter are clipped. maxValue must be positive and defaults to 200.

Remarks

Albedos are computed in EPhotometricStereoImager::Compute.

EPhotometricStereoImager.GetCalibrationAngles

Gets the calibration angles.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetCalibrationAngles(
 out float[] azimuths,
 out float[] elevations
 )
```

Parameters

azimuths

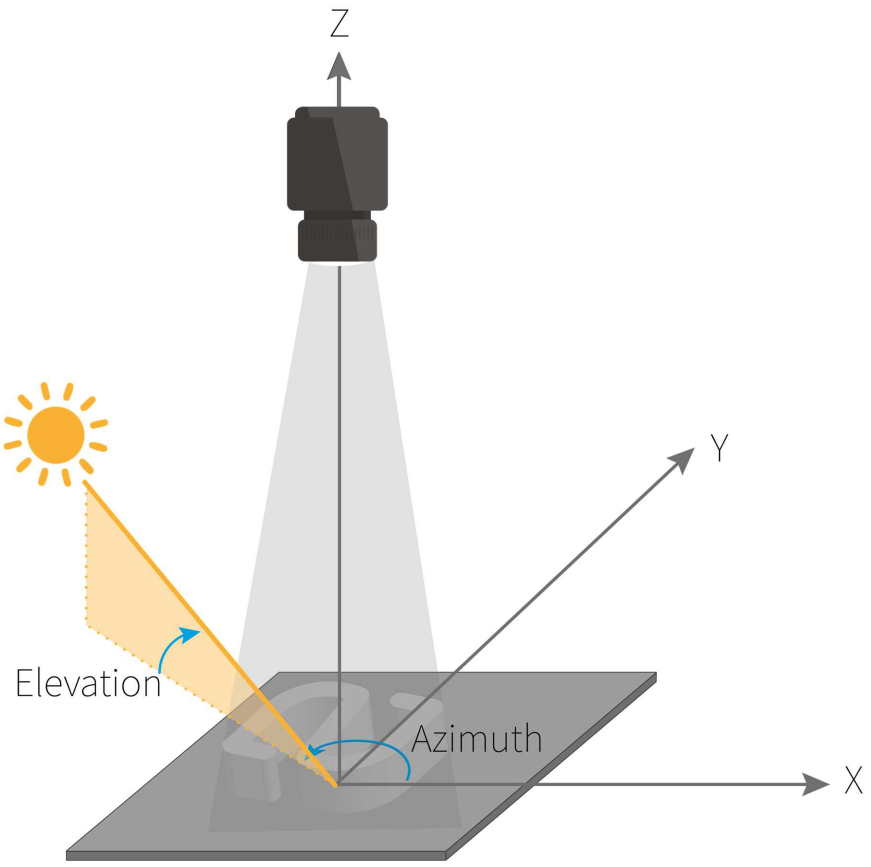
The vector of azimuth angles to retrieve

elevations

The vector of elevation angles to retrieve

Remarks

When facing the image, the axis x points right, y points top and z points towards the camera. Azimuth angles are oriented trigonometrically around the z axis. A light source on the right of the image would have an azimuth of 0 degrees. One on top would have an azimuth of 90 degrees. Elevation is the angle formed by the base plane and the light source. A light source on the horizon would have an elevation of 0 degrees. One on the camera would have an elevation of 90 degrees.



EPhotometricStereoImager.GradientsX

Gets the gradients on the X axis as an EImageBW8.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW8 GradientsX
  { get; }
```

Remarks

Gradients on the X axis are computed in EPhotometricStereoImager::Compute.

EPhotometricStereoImager.GradientsY

Gets the gradients on the Y axis as an EImageBW8.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW8 GradientsY
  { get; }
```

Remarks

Gradients on the Y axis are computed in EPhotometricStereoImager::Compute.

EPhotometricStereoImager.Load

Loads the EPhotometricStereoImager. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

Remarks

Neither photometric stereo results nor intermediary computations are serialized. Thus, results of a call to EPhotometricStereoImager::Compute performed before serialization cannot be retrieved after serialization. On the other hand, the results of the calibration and the NonUniformLightingCorrection are serialized and can be used again.

EPhotometricStereoImager.Normals

Gets the normals as an EImageC24.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EImageC24 Normals
  { get; }
```

Remarks

Normals are computed in EPhotometricStereoImager::Compute.

EPhotometricStereoImager.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPhotometricStereoImager operator=(
 Euresys.Open_eVision.Easy3D.EPhotometricStereoImager other
 )
```

Parameters

other

Another EPhotometricStereoImager.

EPhotometricStereoImager.Save

Saves the EPhotometricStereoImager. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

Remarks

Neither photometric stereo results nor intermediary computations are serialized. Thus, results of a call to EPhotometricStereoImager::Compute performed before serialization cannot be retrieved after serialization. On the other hand, the results of the calibration and the NonUniformLightingCorrection are serialized and can be used again.

EPhotometricStereoImager.SetCalibrationAngles

Sets the calibration angles

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetCalibrationAngles(
 float[] azimuths,
 float[] elevations
 )
```

Parameters

azimuths

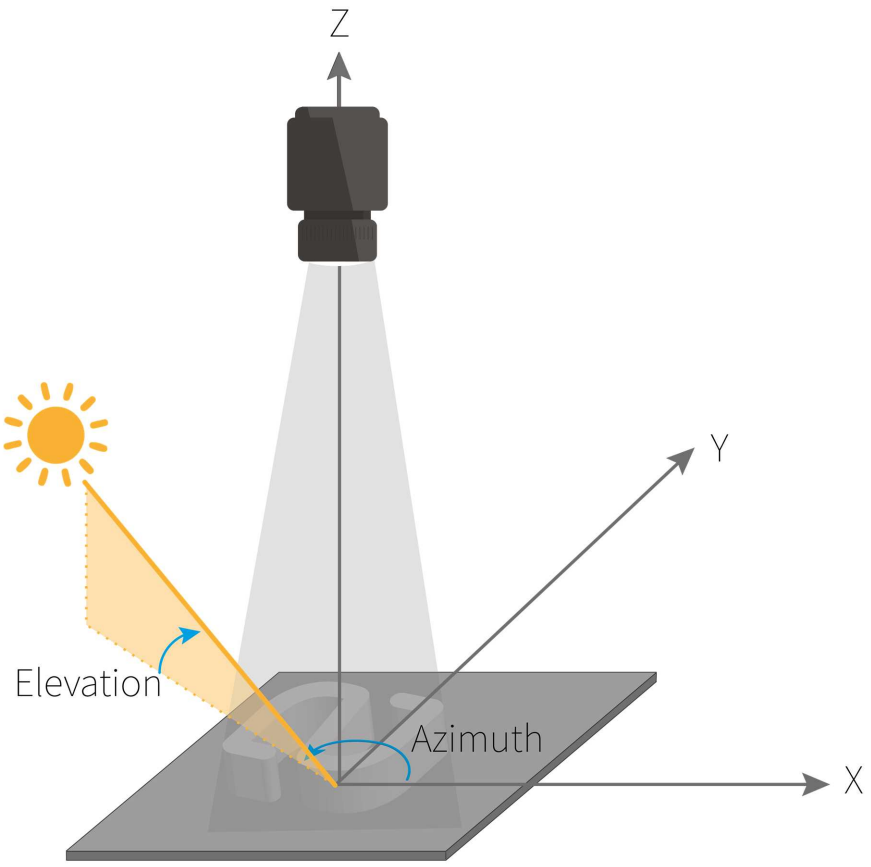
The vector of azimuth angles to set

elevations

The vector of elevation angles to set

Remarks

When facing the image, the axis x points right, y points top and z points towards the camera. Azimuth angles are oriented trigonometrically around the z axis. A light source on the right of the image would have an azimuth of 0 degrees. One on top would have an azimuth of 90 degrees. Elevation is the angle formed by the base plane and the light source. A light source on the horizon would have an elevation of 0 degrees. One on the camera would have an elevation of 90 degrees.



4.182. EPlaneCropper Class

A EPlaneCropper object is used to crop some points of a EPointCloud object.
The points to keep are selected according to their positions with respect to a reference plane.
A EPlaneCropper object is characterized by its reference plane and is used to produce an output EPointCloud object from an input EPointCloud object.
The produced point cloud contains a subset of the input point cloud.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Plane	Sets/gets the new reference E3DPlane of the EPlaneCropper object.

Methods

Crop	Crops an EPointCloud. An output point cloud is produced from an input point cloud by only keeping the points that satisfy the specified condition. The condition tests the (signed) distance of the points with respect to the reference plane of the cropper.
EPlaneCropper	Creates an EPlaneCropper object using a horizontal plane as a default reference.
Load	Loads the EPlaneCropper configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the EPlaneCropper configuration. The given ESerializer must have been created for writing.

EPlaneCropper.Crop

Crops an EPointCloud. An output point cloud is produced from an input point cloud by only keeping the points that satisfy the specified condition.
The condition tests the (signed) distance of the points with respect to the reference plane of the cropper.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Crop(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut,
 Euresys.Open_eVision.Easy3D.EPlaneCropperType type,
 float maxDistance
 )
```

Parameters

cloudIn

The input point cloud.

cloudOut

The output point cloud.

type

An enum of type EPlaneCropperType that specifies which points of the input point cloud will be copied to the output point cloud.

maxDistance

Specifies the distance from the plane for the types "EPlaneCropperType_KeepClose" and "EPlaneCropperType_KeepFar".
It should be 0 for the types "EPlaneCropperType_KeepAbove" and "EPlaneCropperType_KeepBelow.

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

EPlaneCropper.EPlaneCropper

Creates an EPlaneCropper object using a horizontal plane as a default reference.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EPlaneCropper(
 )
void EPlaneCropper(
 Euresys.Open_eVision.Easy3D.E3DPlane plane
 )
void EPlaneCropper(
 Euresys.Open_eVision.Easy3D.EPlaneCropper other
 )
```

Parameters

plane

Reference E3DPlane used for the initialization.

other

Reference EPlaneCropper used for the initialization.

EPlaneCropper.Load

Loads the EPlaneCropper configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPlaneCropper.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPlaneCropper operator=(
 Euresys.Open_eVision.Easy3D.EPlaneCropper other
 )
```

Parameters

other

An other EPlaneCropper.

EPlaneCropper.Plane

Sets/gets the new reference E3DPlane of the EPlaneCropper object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPlane Plane
  { get; set; }
```

EPlaneCropper.Save

Saves the EPlaneCropper configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.183. EPlaneFinder Class

A EPlaneFinder object is used to search an E3DPlane in an EPointCloud.
The algorithm searches **the largest plane** in terms of number of "inliers". A point is an "inlier" when its distance to the plane is smaller than a specified threshold (parameter "maximum distance").
Another parameter specifies the expected ratio of inliers over the total number of points in the point cloud (by default, this is set to 0.3).
For more control, you can also set the expected ratio of inliers as a range, when a single number is given the behavior is equivalent to a range (number/2, number).
The method Find throws an error if it cannot achieve a proportion of inliers better than the min of the range. It stops as soon as the max of the range is achieved.
Reducing the size of the range increases speed.
A decimation is applied by default to accelerate the search.
Furthermore, the expected normal to the plane and/or up to two points contained in the plane may be specified.
The method EPlaneFinder::Find processes an EPointCloud object and returns an E3DPlane object when a sufficiently good plane is found in the input point cloud.
The returned plane is the result of fitting an EPlaneFitter on the inliers.

Namespace: Euresys.Open_eVision.Easy3D

Properties

ExpectedCloudInliersRatio	Sets/gets the expected ratio of inliers in the EPointCloud.
ExpectedCloudInliersRatioRange	Sets/gets the expected ratio of inliers in the EPointCloud.
MaxDeviation	Sets/gets the maximum distance of an inlier to the plane.
NormalTolerance	Returns the angle tolerance around the expected normal (that has been set by EPlaneFinder::SetNormal)

NumberOfPointsAfterDecimation	Sets/gets the number of points surviving the decimation. Using the setter enables the decimation if it wasn't already. if numberOfPointsAfterDecimation is bigger than the point cloud size, no decimation occurs.
NumberOfPointsSet	Returns the number of points set (this will be either 0, 1 or 2).
OnePoint	Sets one point that the plane will be constrained to contain.
Seed	Set seed to a custom value, by default, the random seed used is randomly determined.

Methods

DisableDecimator	Disables the default decimation. The decimation should be disabled when the input point cloud is already decimated.
EnableDecimator	Enables the default decimation which reduces the input point cloud by drawing points randomly. This decimation is enabled by default. The decimation accelerates the search.
EPlaneFinder	Creates an EPlaneFinder object.
Find	Searches the biggest plane in the supplied EPointCloud. If a sufficiently good plane is found, a E3DPlane object is returned. Otherwise an exception is thrown.
GetNormal	Returns the expected normal direction (that has been set by EPlaneFinder::SetNormal)
GetPoint	Returns an E3DPoint the plane is constrained to contain (that has been set by EPlaneFinder or EPlaneFinder::SetTwoPoints)
IsDecimatorEnabled	Returns true if the default decimator is enabled (enabled by default).
IsNormalSet	Returns true if the expected normal direction has been set (not set by default).
IsSeedSet	Returns true if the seed was set to a custom value.
Load	Loads the plane finder configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the plane finder configuration. The given ESerializer must have been created for writing.
SetNormal	Sets the expected normal direction and the tolerance around it. These values are used to limit the scope of the plane search. If the angular tolerance is not specified, a default value of 5 degrees is assumed. If the tolerance is specified, the value should be strictly positive and correspond to less than 90 degrees.
SetTwoPoints	Sets two points that the plane will be constrained to contain.
UnsetNormal	Unsets the normal vector definition.
UnsetPoints	Unsets the 1 or 2 points that the plane is constrained to contain.

UnsetSeed	Reset seed to its default state of being randomly initialized.

EPlaneFinder.DisableDecimator

Disables the default decimation.
The decimation should be disabled when the input point cloud is already decimated.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DisableDecimator(
 )
```

EPlaneFinder.EnableDecimator

Enables the default decimation which reduces the input point cloud by drawing points randomly.
This decimation is enabled by default. The decimation accelerates the search.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EnableDecimator(
 )
```

EPlaneFinder.EPlaneFinder

Creates an EPlaneFinder object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EPlaneFinder(
 float maxDeviation,
 float pcExpectedInCloud
 )

void EPlaneFinder(
 float maxDeviation,
 Euresys.Open_eVision.EFloatRange pcExpectedInCloudRange
 )

void EPlaneFinder(
 Euresys.Open_eVision.Easy3D.EPlaneFinder other
 )
```

Parameters

maxDeviation

Maximum distance of an inlier to the plane. This value has to be strictly positive.

pcExpectedInCloud

This is an estimation of the ratio of inliers in the point cloud.
This optional parameter has a default value of 0.3.
The algorithm stops as soon as a pointCloud with at least pcExpectedInCloud inliers is found.
It throws an error if the best plane has less than pcExpectedInCloud/2 inliers.

pcExpectedInCloudRange

This is an estimation of the ratio of inliers in the point cloud as a range within]0, 1[.
The algorithm throws an error if the best plane has less than inliersProportion.min inliers.
The algorithm stops as soon as a model with inliersProportion.max is found.
Increasing inliersProportion.min can increase speed but at the risk of missing the plane.
Decreasing the max of the range can increase speed but at the risk of finding a bad plane.

other

The EPlaneFinder object that should be copied.

EPlaneFinder.ExpectedCloudInliersRatio

Sets/gets the expected ratio of inliers in the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float ExpectedCloudInliersRatio
  { get; set; }
```

Remarks

This setter/getter is used to access the max of the range, its behavior is the same as SetExpectedCloudInliersRatioRange(EFloatRange(pcExpectedInCloud/2, pcExpectedInCloud)) and GetExpectedCloudInliersRatioRange().GetUpperBound()

EPlaneFinder.ExpectedCloudInliersRatioRange

Sets/gets the expected ratio of inliers in the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange ExpectedCloudInliersRatioRange
  { get; set; }
```

Remarks

This is an estimation of the ratio of inliers in the point cloud as a range within]0, 1[.
If pcExpectedInCloudRange.min is too small, we risk missing the plane.
The algorithm throws an error if the best plane has less than pcExpectedInCloudRange.min inliers. The algorithm stops as soon as a model with pcExpectedInCloudRange.max is found.
Increasing pcExpectedInCloudRange.min can increase speed.
Decreasing pcExpectedInCloudRange.max can increase speed.

EPlaneFinder.Find

Searches the biggest plane in the supplied EPointCloud. If a sufficiently good plane is found, a E3DPlane object is returned.
Otherwise an exception is thrown.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPlane Find(
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud
 )

Euresys.Open_eVision.Easy3D.E3DPlane Find(
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 out float effectiveInliersRatio
 )

Euresys.Open_eVision.Easy3D.E3DPlane Find(
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 out float effectiveInliersRatio,
 Euresys.Open_eVision.Easy3D.EPointCloud inliers
 )

Euresys.Open_eVision.Easy3D.E3DPlane Find(
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 out float effectiveInliersRatio,
 Euresys.Open_eVision.Easy3D.EPointCloud inliers,
 Euresys.Open_eVision.Easy3D.EPointCloud outliers
 )
```

Parameters

pointCloud

The input point cloud in which the plane should be searched (need at least 3 points)

effectiveInliersRatio

This passed by reference float will contain the effective ratio of inliers

inliers

A pointcloud that will contain the inliers of the plane

outliers

A pointcloud that will contain the outliers of the plane

EPlaneFinder.GetNormal

Returns the expected normal direction (that has been set by EPlaneFinder::SetNormal)

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetNormal(
 )
```

EPlaneFinder.GetPoint

Returns an E3DPoint the plane is constrained to contain (that has been set by EPlaneFinder or EPlaneFinder::SetTwoPoints)

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetPoint(
 bool first
 )
```

Parameters

first

True if you want to get the first point and false if you want the second instead.

EPlaneFinder.IsDecimatorEnabled

Returns true if the default decimator is enabled (enabled by default).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsDecimatorEnabled(
 )
```

EPlaneFinder.IsNormalSet

Returns true if the expected normal direction has been set (not set by default).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsNormalSet(
 )
```

EPlaneFinder.IsSeedSet

Returns true if the seed was set to a custom value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsSeedSet(
 )
```

EPlaneFinder.Load

Loads the plane finder configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
: The file path.

serializer
: The serializer.

EPlaneFinder.MaxDeviation

Sets/gets the maximum distance of an inlier to the plane.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MaxDeviation
```

```
{ get; set; }
```

EPlaneFinder.NormalTolerance

Returns the angle tolerance around the expected normal (that has been set by EPlaneFinder::SetNormal)

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float NormalTolerance
  { get; }
```

EPlaneFinder.NumberOfPointsAfterDecimation

Sets/gets the number of points surviving the decimation. Using the setter enables the decimation if it wasn't already. if numberOfPointsAfterDecimation is bigger than the point cloud size, no decimation occurs.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumberOfPointsAfterDecimation
  { get; set; }
```

EPlaneFinder.NumberOfPointsSet

Returns the number of points set (this will be either 0, 1 or 2).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumberOfPointsSet
  { get; }
```

EPlaneFinder.OnePoint

Sets one point that the plane will be constrained to contain.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint OnePoint
```

```
{ get; set; }
```

Remarks

To set 2 points, use the function SetTwoPoints.
If two points were previously set, the second one will be removed by this function.

EPlaneFinder.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPlaneFinder operator=(
 Euresys.Open_eVision.Easy3D.EPlaneFinder other
 )
```

Parameters

other
The EPlaneFinder object that should be copied.

EPlaneFinder.Save

Saves the plane finder configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.
serializer
The ESerializer object that is written to.

EPlaneFinder.Seed

Set seed to a custom value, by default, the random seed used is randomly determined.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
uint Seed
  { get; set; }
```

EPlaneFinder.SetNormal

Sets the expected normal direction and the tolerance around it. These values are used to limit the scope of the plane search.
If the angular tolerance is not specified, a default value of 5 degrees is assumed.
If the tolerance is specified, the value should be strictly positive and correspond to less than 90 degrees.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetNormal(
 Euresys.Open_eVision.Easy3D.E3DPoint normal
 )

void SetNormal(
 Euresys.Open_eVision.Easy3D.E3DPoint normal,
 float angleTolerance
 )

void SetNormal(
 float nx,
 float ny,
 float nz
 )

void SetNormal(
 float nx,
 float ny,
 float nz,
 float angleTolerance
 )

void SetNormal(
 Euresys.Open_eVision.Easy3D.E3DPlane referencePlane
 )

void SetNormal(
 Euresys.Open_eVision.Easy3D.E3DPlane referencePlane,
 float angleTolerance
 )
```

Parameters

normal

The normal vector specifies the expected perpendicular direction of the plane.

angleTolerance

The angle tolerance is the maximum angular deviation around the expected normal (strictly positive and smaller than 90 degrees). It's set to 5 degrees by default.

nx

The x component of the normal vector.

ny

The y component of the normal vector.

nz

The z component of the normal vector.

referencePlane

The reference plane specifies the expected perpendicular direction.

EPlaneFinder.SetTwoPoints

Sets two points that the plane will be constrained to contain.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetTwoPoints(
 Euresys.Open_eVision.Easy3D.E3DPoint point1,
 Euresys.Open_eVision.Easy3D.E3DPoint point2
 )
```

Parameters

point1

The first point.

point2

The second point.

Remarks

To set 1 point, use the function SetOnePoint

EPlaneFinder.UnsetNormal

Unsets the normal vector definition.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetNormal(
 )
```

EPlaneFinder.UnsetPoints

Unsets the 1 or 2 points that the plane is constrained to contain.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetPoints(
 )
```

EPlaneFinder.UnsetSeed

Reset seed to its default state of being randomly initialized.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetSeed(
 )
```

4.184. EPlaneFitter Class

A EPlaneFitter object is used to fit an E3DPlane on an EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

Properties

MinSampleCount	Sets/Gets the minimum number of samples required for fitting on each side of the shape. By default, a value of 3 is assumed.

Methods

EPlaneFitter	Constructor of an EPlaneFitter object.
Fit	Fits an E3DPlane on a given EPointCloud.
Load	Loads the EPlaneFitter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the EPlaneFitter configuration. The given ESerializer must have been created for writing.

EPlaneFitter.EPlaneFitter

Constructor of an EPlaneFitter object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EPlaneFitter(
 )
void EPlaneFitter(
 Euresys.Open_eVision.Easy3D.EPlaneFitter other
 )
```

Parameters

other

Reference to the EPlaneFitter used for the initialization.

EPlaneFitter.Fit

Fits an E3DPlane on a given EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane Fit(
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
Euresys.Open_eVision.Easy3D.E3DPlane Fit(
 Euresys.Open_eVision.Easy3D.EPointCloud pc,
 out float averageDistance
 )
```

Parameters

pc

The reference to the point cloud.

averageDistance

The reference to a float which will store the average distance from this plane to the points that were used for the fit.

EPlaneFitter.Load

Loads the EPlaneFitter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPlaneFitter.MinSampleCount

Sets/Gets the minimum number of samples required for fitting on each side of the shape.
By default, a value of 3 is assumed.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int MinSampleCount
  { get; set; }
```

EPlaneFitter.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPlaneFitter operator=(
 Euresys.Open_eVision.Easy3D.EPlaneFitter other
 )
```

Parameters

other

The EPlaneFitter object that should be copied.

EPlaneFitter.Save

Saves the EPlaneFitter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.185. EPoint Class

An exact (floating-point) location in the 2D space.

Derived Class(es):EFrame

Namespace: Euresys.Open_eVision

Properties

Center	Center coordinates of a EPoint object.
X	Abscissa (X coordinate) of the EPoint object
Y	Ordinate (Y coordinate) of the EPoint object

Methods

Area	Compute the oriented area of the parallelogram built on two EPoint.
Argument	Compute the polar argument of a EPoint object.
CopyTo	Copies all the data of the current EPoint object into another EPoint object and returns it.
Cross	Compute the cross product of two EPoint object.
Distance	Returns the distance between the addressed point and an EPoint object.
Dot	Compute the dot product of two EPoint object.
EPoint	Constructs a EPoint object.
Load	Load the EPoint configuration. The given ESerializer must have been created for reading.
MidPoint	Returns the middle coordinate between this EPoint object and another EPoint object.

Modulus	Compute the euclidean modulus of a EPoint.
operator-	Subtracts from the current EPoint center coordinates the center coordinates of another EPoint object.
operator!=	Compares the current EPoint center coordinates with the center coordinates of another EPoint object.
operator*	Multiplies the current EPoint center coordinates by a given multiplier.
operator/	Divides the current EPoint center coordinates by a given divisor.
operator+	Adds to the current EPoint center coordinates the center coordinates of another EPoint object.
operator=	Copies all the data from another EPoint object into the current EPoint object.
operator==	Compares the current EPoint center coordinates with the center coordinates of another EPoint object.
Project	Compute the orthogonal projection of a EPoint on another shape.
Rotate	Returns another EPoint object containing the coordinated of the rotated point.
Save	Save the EPoint configuration. The given ESerializer must have been created for writing.
SetCenterXY	Sets the center coordinates of a EPoint object.
Square	Compute the sum of the squared coordinates of a EPoint.
SquaredDistance	Compute the squared distance between two EPoint.

EPoint.Area

Compute the oriented area of the parallelogram built on two EPoint.

Namespace: Euresys.Open_eVision

[C#]

```
float Area(
 Euresys.Open_eVision.EPoint Point
 )
```

Parameters

Point

Second edge of the parallelogram.

Remarks

Compute the oriented area of the parallelogram built on two EPoint. The area is counted as positive if the oriented vector pair ('first edge', 'second edge') is in the same sense that the axis frame. This oriented area can also be viewed as the z-coordinate of a vector product of two 3D vectors obtained in supplementing each edges with a third z-coordinate (set to zero).

EPoint.Argument

Compute the polar argument of a EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
float Argument(
 )
```

Remarks

Compute the angle (in radians) between the oriented X-axis and the vector going from the axis origin and the EPoint. If the axis frame is orthogonal, this number is also the polar argument of the EPoint.

EPoint.Center

Center coordinates of a EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
virtual Euresys.Open_eVision.EPoint Center
   { get; set; }
```

EPoint.CopyTo

Copies all the data of the current EPoint object into another EPoint object and returns it.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.EPoint other
 )

Euresys.Open_eVision.EPoint CopyTo(
 Euresys.Open_eVision.EPoint other
 )
```

Parameters

other

Pointer to the EPoint object in which the current EPoint object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EPoint object will be created and returned.

EPoint.Cross

Compute the cross product of two EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
float Cross(
 Euresys.Open_eVision.EPoint Point
 )
```

Parameters

Point

Second factor of the cross product.

EPoint.Distance

Returns the distance between the addressed point and an EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
float Distance(
 Euresys.Open_eVision.EPoint point
 )
float Distance(
 Euresys.Open_eVision.ELine line,
 bool segmentOnly
 )
float Distance(
 Euresys.Open_eVision.ECircle circle,
 bool arcOnly
 )
```

Parameters

point

EPoint object with which to calculate the distance.

line

ELine object with which to calculate the distance.

segmentOnly

By default (false), the line is not restricted to a segment.

circle

ECircle object with which to calculate the distance.

arcOnly

By default (false), the circle is not restricted to an arc.

Remarks

Many EasyGauge members provide measurement result as a EPoint object (see EPointGauge::Center, EPointGauge::GetMeasuredPoint,...). The EPoint class has its own members to retrieve all the information pertaining to a point. Among them, the Distance method returns the distance between a point pair or between a point and a line segment, a circle arc or a rectangle.

EPoint.Dot

Compute the dot product of two EPoint object.

Namespace: Euresys.Open_eVision

[C#]

```
float Dot(
 Euresys.Open_eVision.EPoint Point
 )
```

Parameters

Point

Second factor of the dot product.

EPoint.EPoint

Constructs a EPoint object.

Namespace: Euresys.Open_eVision

[C#]

```
void EPoint(
 )

void EPoint(
 float centerX,
 float centerY
 )

void EPoint(
 Euresys.Open_eVision.EPoint other
 )
```

Parameters

centerX

Center coordinates of the EPoint object.

centerY

Center coordinates of the EPoint object.

other

Another EPoint object to be copied in the new EPoint object.

EPoint.Load

Load the EPoint configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EPoint.MidPoint

Returns the middle coordinate between this EPoint object and another EPoint object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint MidPoint(
 Euresys.Open_eVision.EPoint Point
 )
```

Parameters

Point
The other EPoint object.

EPoint.Modulus

Compute the euclidean modulus of a EPoint.

Namespace: Euresys.Open_eVision

[C#]

```
float Modulus(
 )
```

Remarks

Compute the squared root of the sum of the squared coordinates of an EPoint. If the axis frame is orthogonal, this number is also the euclidean norm of the EPoint.

EPoint.operator-

Subtracts from the current EPoint center coordinates the center coordinates of another EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint operator-(
 Euresys.Open_eVision.EPoint point
 )
```

Parameters

point

The other EPoint object.

EPoint.operator!=

Compares the current EPoint center coordinates with the center coordinates of another EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EPoint point
 )
```

Parameters

point

The other EPoint object.

Remarks

Returns true if EPoint::X or EPoint::Y are respectively different.

EPoint.operator*

Multiplies the current EPoint center coordinates by a given multiplier.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint operator*(
 float scalar
 )
```

Parameters

scalar

The multiplier.

EPoint.operator/

Divides the current EPoint center coordinates by a given divisor.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint operator/(
 float scalar
 )
```

Parameters

scalar

The divisor.

EPoint.operator+

Adds to the current EPoint center coordinates the center coordinates of another EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint operator+(
 Euresys.Open_eVision.EPoint point
 )
```

Parameters

point

The other EPoint object.

EPoint.operator=

Copies all the data from another EPoint object into the current EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint operator=(
 Euresys.Open_eVision.EPoint other
 )
```

Parameters

other

EPoint object to be copied.

EPoint.operator==

Compares the current EPoint center coordinates with the center coordinates of another EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EPoint point
 )
```

Parameters

point

The other EPoint object.

Remarks

Returns true if both EPoint::X and EPoint::Y are respectively the same.

EPoint.Project

Compute the orthogonal projection of a EPoint on another shape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Project(
 Euresys.Open_eVision.ELine shape
 )

Euresys.Open_eVision.EPoint Project(
 Euresys.Open_eVision.ECircle shape
 )
```

Parameters

shape

Shape object to which point is projected

Remarks

Compute the orthogonal projection of a EPoint on another shape. This computation is only valid when the axis frame is orthogonal.

EPoint.Rotate

Returns another EPoint object containing the coordinated of the rotated point.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Rotate(
 float angle
 )
```

Parameters

angle

Rotation angle (in radians)

Remarks

Rotates a EPoint around the origin (0, 0) by an angle of angle radians. By definition, the smallest (in absolute value) rotation of the oriented X-Axis toward the oriented Y-Axis is chosen as the positive sense of rotation. In a direct frame, this is also the trigonometric sense (counter clockwise).

EPoint.Save

Save the EPoint configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPoint.SetCenterXY

Sets the center coordinates of a EPoint object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the EPoint object.

centerY

Center coordinates of the EPoint object.

EPoint.Square

Compute the sum of the squared coordinates of a EPoint.

Namespace: Euresys.Open_eVision

```
[C#]
float Square(
 )
```

Remarks

Compute the sum of the squared coordinates of a EPoint. If the axis frame is orthogonal, this sum of squares is also the squared euclidean norm of the EPoint object.

EPoint.SquaredDistance

Compute the squared distance between two EPoint.

Namespace: Euresys.Open_eVision

```
[C#]
float SquaredDistance(
 Euresys.Open_eVision.EPoint Point
 )
```

Parameters

Point

Second EPoint.

Remarks

Compute the sum of squared coordinates differences of two EPoint. If the axis frame is orthogonal, this number is also the squared euclidean distance between two EPoint.

EPoint.X

Abscissa (X coordinate) of the EPoint object

Namespace: Euresys.Open_eVision

[C#]

```
float X
  { get; }
```

EPoint.Y

Ordinate (Y coordinate) of the EPoint object

Namespace: Euresys.Open_eVision

[C#]

```
float Y
  { get; }
```

4.186. EPointCloud Class

Represents a 3D point cloud.

Namespace: Euresys.Open_eVision.Easy3D

Properties

EnableSpacePartition	Sets/Gets the status of space partitioning when computing distance to Segments and Lines. Space partitioning is a way to speed up the geometric queries on EPointCloud. The affected methods are EPointCloud::DistanceToSegment, EPointCloud::DistanceToLine. By default, space partition is disabled for these two methods.
NumPoints	Number of points in the EPointCloud.
PointsBuffer	Retrieves a pointer to the internal points buffer.

Methods

AddCustomAttributeBuffer	Allocates and copies the data to the new custom attribute buffer.
AddPoint	Adds a point to the EPointCloud.
AddPointAndAttributesTo	Adds a point and its attributes to another EPointCloud.
AddPointCloud	Adds the points of another point cloud to EPointCloud.
AddPoints	Adds a vector of points to the EPointCloud.
AllocateAttributeBuffer	Allocates an attribute buffer and fills it with defaultValue if the cloud is not empty.
AllocateCustomAttributeBuffer	Allocates the data to the new custom attribute buffer and fills it with default values.
Clear	Empties the EPointCloud.
ClearAttributeBuffer	Empties the attribute buffer.
ComputeNormalsAndCurvatures	Compute the normals of the cloud's points by fitting a plane on the 10 neighbors points. This method does not allow to compute the sign of the normals (we can't determine if a normal is x,y,z or -x,-y,-z). The curvatures of the points will be computed when the computeCurvatures argument is set to true.
ComputePlaneBehind	Returns the E3DPlane with given normal on which the EPointCloud lays. This is useful when projecting an EPointCloud on an EZMap.
CopyAllAttributesTo	Copies all attributes at a given index from one EPointCloud to another one.
DistanceToLine	Returns the shortest distance between an E3DPoint of the EPointCloud and a line represented by 2 E3DPoint.
DistanceToSegment	Returns the shortest distance between an E3DPoint of the EPointCloud and a segment represented by 2 E3DPoint.
EPointCloud	Creates an EPointCloud object.
FillAttributeBuffer	Allocates and copies the data to the attribute buffer.
FillPointsBuffer	Copies an external points buffer into the internal points buffer.
GetAttribute	Retrieve the value of an attribute.
GetAttributeBuffer	Retrieves a pointer to the internal attribute buffer.
GetAttributeBufferType	Returns the EAttributeType corresponding to the E3DAttribute.
GetInitializedAttributes	Fills the vector with the ids (in growing order) of all the attributes that have been initialized.
GetPoint	Retrieves a point from the EPointCloud.
HasAttributeBuffer	Returns true if a buffer of the given E3DAttribute exists in the point cloud

Load	Loads the EPointCloud. Supported formats are Open eVision proprietary, CSV, OBJ, PCD, PLY and XYZ. The given ESerializer must have been created for reading.
LoadCSV	Loads an EPointCloud stored in the CSV (Comma-Separated Values) file format.
LoadOBJ	Loads an EPointCloud stored in the OBJ file format.
LoadPCD	Loads an EPointCloud stored in the PCD (Point Cloud Library) file format. ASCII and binary formats are compatible.
LoadPLY	Loads an EPointCloud stored in the PLY file format.
LoadXYZ	Loads an EPointCloud stored in the XYZ file format.
operator=	Assignment operator.
PrepareSpacePartition	Enables the build of the space partition (like EPointCloud) and builds it now instead of when it is first needed. The computation time of the space partition depends on the number of points in the point cloud.
RemovePoint	Removes a point and its corresponding attributes from the EPointCloud.
Save	Saves the EPointCloud. Supported formats are Open eVision proprietary, CSV, OBJ, PCD, PLY and XYZ. The given ESerializer must have been created for writing.
SaveCSV	Saves the EPointCloud in the CSV (Comma-Separated Values) file format.
SaveOBJ	Saves the EPointCloud in the OBJ file format.
SavePCD	Saves the EPointCloud in the PCD (Point Cloud Library) file format. ASCII and binary formats are available.
SavePLY	Saves the EPointCloud in the PLY file format.
SaveXYZ	Saves the EPointCloud in the XYZ file format.
SetAttribute	Sets the corresponding attribute at the given index.

EPointCloud.AddCustomAttributeBuffer

Allocates and copies the data to the new custom attribute buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int AddCustomAttributeBuffer(
 byte[] data
 )

int AddCustomAttributeBuffer(
 byte[] data,
 byte defaultValue
 )
```

```
int AddCustomAttributeBuffer(
 ushort[] data
 )

int AddCustomAttributeBuffer(
 ushort[] data,
 ushort defaultValue
 )

int AddCustomAttributeBuffer(
 uint[] data
 )

int AddCustomAttributeBuffer(
 uint[] data,
 uint defaultValue
 )

int AddCustomAttributeBuffer(
 int[] data
 )

int AddCustomAttributeBuffer(
 int[] data,
 int defaultValue
 )

int AddCustomAttributeBuffer(
 float[] data
 )

int AddCustomAttributeBuffer(
 float[] data,
 float defaultValue
 )

int AddCustomAttributeBuffer(
 double[] data
 )

int AddCustomAttributeBuffer(
 double[] data,
 double defaultValue
 )

int AddCustomAttributeBuffer(
 Euresys.Open_eVision.EC24A[] data
 )

int AddCustomAttributeBuffer(
 Euresys.Open_eVision.EC24A[] data,
 Euresys.Open_eVision.EC24A defaultValue
 )

int AddCustomAttributeBuffer(
 Euresys.Open_eVision.Easy3D.E3DPoint[] data
 )
```

```
int AddCustomAttributeBuffer(
 Euresys.Open_eVision.Easy3D.E3DPoint[] data,
 Euresys.Open_eVision.Easy3D.E3DPoint defaultValue
 )
```

Parameters

data

The address of the external attribute buffer. The buffer should be of the same length as the EPointCloud (see EPointCloud::NumPoints).

defaultValue

The value used to set the attribute when the EPointCloud grows (see EPointCloud::AddPoint, EPointCloud::AddPoints and EPointCloud::AddPointCloud).

Remarks

An exception is also thrown if data is nullptr, if you don't want to specify the data, use EPointCloud::AllocateCustomAttributeBuffer.

EPointCloud.AddPoint

Adds a point to the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AddPoint(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The E3DPoint to add to the point cloud.

EPointCloud.AddPointAndAttributesTo

Adds a point and its attributes to another EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AddPointAndAttributesTo(
 Euresys.Open_eVision.Easy3D.EPointCloud dstCloud,
 uint srcIndex,
 bool addAttributeIfNotPresent
 )
```

Parameters

dstCloud

The EPointCloud where the attributes are copied.

srcIndex

The index of the element to copy from the source EPointCloud.

addAttributeIfNotPresent

Whether to initialize a buffer if it is present in EPointCloud but not in dstCloud. this could result in the creation of an attribute filled with default values.

EPointCloud.AddPointCloud

Adds the points of another point cloud to EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddPointCloud(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 bool addAttributeIfNotPresent
 )
```

Parameters

cloud

Point cloud whose points will be added to the point cloud.

addAttributeIfNotPresent

Whether to initialize a buffer if it is present cloud but not in EPointCloud. this could result in the creation of an attribute filled with default values.

EPointCloud.AddPoints

Adds a vector of points to the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddPoints(
 Euresys.Open_eVision.Easy3D.E3DPoint[] points
 )
```

Parameters

points

Vector of E3DPoint to add to the point cloud.

EPointCloud.AllocateAttributeBuffer

Allocates an attribute buffer and fills it with defaultValue if the cloud is not empty.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AllocateAttributeBuffer(
 int attribute,
 byte defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 ushort defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 uint defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 int defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 float defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 double defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 Euresys.Open_eVision.EC24A defaultValue
 )

void AllocateAttributeBuffer(
 int attribute,
 Euresys.Open_eVision.Easy3D.E3DPoint defaultValue
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

defaultValue

The value used to set the attribute when the EPointCloud grows (see EPointCloud::AddPoint, EPointCloud::AddPoints and EPointCloud::AddPointCloud).

Remarks

If the data type is not correct depending on the E3DAttribute, it throws an EException with an EError.

EPointCloud.AllocateCustomAttributeBuffer

Allocates the data to the new custom attribute buffer and fills it with default values.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int AllocateCustomAttributeBuffer(
 byte defaultValue
 )

int AllocateCustomAttributeBuffer(
 ushort defaultValue
 )

int AllocateCustomAttributeBuffer(
 uint defaultValue
 )

int AllocateCustomAttributeBuffer(
 int defaultValue
 )

int AllocateCustomAttributeBuffer(
 float defaultValue
 )

int AllocateCustomAttributeBuffer(
 double defaultValue
 )

int AllocateCustomAttributeBuffer(
 Euresys.Open_eVision.EC24A defaultValue
 )

int AllocateCustomAttributeBuffer(
 Euresys.Open_eVision.Easy3D.E3DPoint defaultValue
 )
```

Parameters

defaultValue

The value used to set the attribute initially and when the EPointCloud grows (see EPointCloud::AddPoint, EPointCloud::AddPoints and EPointCloud::AddPointCloud).

EPointCloud.Clear

Empties the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Clear(
 )
```

EPointCloud.ClearAttributeBuffer

Empties the attribute buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ClearAttributeBuffer(
 int attribute
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

Remarks

If the attribute buffer was a custom attribute, the id is not valid after the call to the method as the buffer will have been deallocated.

EPointCloud.ComputeNormalsAndCurvatures

Compute the normals of the cloud's points by fitting a plane on the 10 neighbors points. This method does not allow to compute the sign of the normals (we can't determine if a normal is x,y,z or -x,-y,-z).
The curvatures of the points will be computed when the computeCurvatures argument is set to true.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ComputeNormalsAndCurvatures(
 bool computeCurvatures,
 uint nbAdditionalNeighborsForCurvatures
 )
```

Parameters

computeCurvatures

Set to true to compute the local curvatures (numbers between 0 for a plane and 1/3 for random noise) of each point as well.

nbAdditionalNeighborsForCurvatures

Each curvature is computed using 10 + nbAdditionalNeighborsForCurvatures points.

Remarks

The normals are stored in the Normal attribute buffer and the curvatures in the Curvature attribute buffer (if requested).

EPointCloud.ComputePlaneBehind

Returns the E3DPlane with given normal on which the EPointCloud lays. This is useful when projecting an EPointCloud on an EZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPlane ComputePlaneBehind(
 Euresys.Open_eVision.Easy3D.E3DPoint normal,
 float margin
 )
```

Parameters

normal

The normal of the plane.

margin

Let P be the plane, A point of the EPointCloud closest to P and B the of the EPointCloud furthest to B. margin = dist(P, A) / dist(P, B). Must be positive. Default: 0.02.

EPointCloud.CopyAllAttributesTo

Copies all attributes at a given index from one EPointCloud to another one.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void CopyAllAttributesTo(
 Euresys.Open_eVision.Easy3D.EPointCloud dstCloud,
 uint dstIndex,
 uint srcIndex
 )
```

Parameters

dstCloud

The EPointCloud where the attributes are copied.

dstIndex

The index of the destination EPointCloud.

srcIndex

The index of the source EPointCloud.

Remarks

An attribute is copied only if both attribute buffers are initialized. If both attribute types are not the same, then a conversion is done (if possible). This function does not perform an allocation. To add a new point with all its attributes to another EPointCloud, use function EPointCloud::AddPointAndAttributesTo.

EPointCloud.DistanceToLine

Returns the shortest distance between an E3DPoint of the EPointCloud and a line represented by 2 E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float DistanceToLine(
 Euresys.Open_eVision.Easy3D.E3DPoint origin,
 Euresys.Open_eVision.Easy3D.E3DPoint end
 )

float DistanceToLine(
 Euresys.Open_eVision.Easy3D.E3DPoint origin,
 Euresys.Open_eVision.Easy3D.E3DPoint end,
 out Euresys.Open_eVision.Easy3D.E3DPoint closest,
 out int closestIndex
 )
```

Parameters

origin
One point of the line.

end
The other point of the line.

closest
Where the closest point will be stored.

closestIndex
Where the index of the closest point will be stored.

EPointCloud.DistanceToSegment

Returns the shortest distance between an E3DPoint of the EPointCloud and a segment represented by 2 E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float DistanceToSegment(
 Euresys.Open_eVision.Easy3D.E3DPoint origin,
 Euresys.Open_eVision.Easy3D.E3DPoint end
 )
float DistanceToSegment(
 Euresys.Open_eVision.Easy3D.E3DPoint origin,
 Euresys.Open_eVision.Easy3D.E3DPoint end,
 out Euresys.Open_eVision.Easy3D.E3DPoint closest,
 out int closestIndex
 )
```

Parameters

origin
One endpoint of the segment.

end
The other endpoint of the segment.

closest
Where the closest point will be stored.

closestIndex
Where the index of the closest point will be stored.

EPointCloud.EnableSpacePartition

Sets/Gets the status of space partitioning when computing distance to Segments and Lines. Space partitioning is a way to speed up the geometric queries on EPointCloud. The affected methods are EPointCloud::DistanceToSegment, EPointCloud::DistanceToLine. By default, space partition is disabled for these two methods.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableSpacePartition
  { get; set; }
```

Remarks

See also EPointCloud::PrepareSpacePartition. For EPointCloud, the same space partition is used but it cannot be disabled as using it is always faster.

EPointCloud.EPointCloud

Creates an EPointCloud object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EPointCloud(
 )
void EPointCloud(
 Euresys.Open_eVision.Easy3D.EPointCloud other
 )
```

Parameters

other

Reference to the EPointCloud used for the initialization.

EPointCloud.FillAttributeBuffer

Allocates and copies the data to the attribute buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillAttributeBuffer(
 int attribute,
 byte[] data
 )
void FillAttributeBuffer(
 int attribute,
 byte[] data,
 byte defaultValue
 )
void FillAttributeBuffer(
 int attribute,
 ushort[] data
 )
```

```
void FillAttributeBuffer(
 int attribute,
 ushort[] data,
 ushort defaultValue
 )

void FillAttributeBuffer(
 int attribute,
 uint[] data
 )

void FillAttributeBuffer(
 int attribute,
 uint[] data,
 uint defaultValue
 )

void FillAttributeBuffer(
 int attribute,
 int[] data
 )

void FillAttributeBuffer(
 int attribute,
 int[] data,
 int defaultValue
 )

void FillAttributeBuffer(
 int attribute,
 float[] data
 )

void FillAttributeBuffer(
 int attribute,
 float[] data,
 float defaultValue
 )

void FillAttributeBuffer(
 int attribute,
 double[] data
 )

void FillAttributeBuffer(
 int attribute,
 double[] data,
 double defaultValue
 )

void FillAttributeBuffer(
 int attribute,
 Euresys.Open_eVision.EC24A[] data
 )
```

```
void FillAttributeBuffer(
 int attribute,
 Euresys.Open_eVision.EC24A[] data,
 Euresys.Open_eVision.EC24A defaultValue
 )
void FillAttributeBuffer(
 int attribute,
 Euresys.Open_eVision.Easy3D.E3DPoint[] data
 )
void FillAttributeBuffer(
 int attribute,
 Euresys.Open_eVision.Easy3D.E3DPoint[] data,
 Euresys.Open_eVision.Easy3D.E3DPoint defaultValue
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

data

The address of the external attribute buffer. The buffer should be of the same length as the EPointCloud (see EPointCloud::NumPoints).

defaultValue

The value used to set the attribute when the EPointCloud grows (see EPointCloud::AddPoint, EPointCloud::AddPoints and EPointCloud::AddPointCloud).

Remarks

If the data type is not correct depending on the E3DAttribute, it throws an EException with an EError. An exception is also thrown if data is nullptr, if you don't want to specify the data, use EPointCloud::AllocateAttributeBuffer.

EPointCloud.FillPointsBuffer

Copies an external points buffer into the internal points buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillPointsBuffer(
 IntPtr pointsBuffer,
 int numPoints
 )
```

Parameters

pointsBuffer

Address of the external points buffer.

numPoints

Number of points in the external points buffer.

Remarks

The buffer must contain points in the form of triplets of 32bits floats stored in the (X,Y,Z) order.

EPointCloud.GetAttribute

Retrieve the value of an attribute.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetAttribute(
 int attribute,
 uint index,
 out byte value
 )

void GetAttribute(
 int attribute,
 uint index,
 out ushort value
 )

void GetAttribute(
 int attribute,
 uint index,
 out uint value
 )

void GetAttribute(
 int attribute,
 uint index,
 out int value
 )

void GetAttribute(
 int attribute,
 uint index,
 out float value
 )

void GetAttribute(
 int attribute,
 uint index,
 out double value
 )
```

```
void GetAttribute(
 int attribute,
 uint index,
 out Euresys.Open_eVision.EC24A value
 )
void GetAttribute(
 int attribute,
 uint index,
 out Euresys.Open_eVision.Easy3D.E3DPoint value
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

index

The index of the element.

value

Where the attribute value will be stored.

Remarks

If the attribute has not been initialized or if the index is out of bound, it throws an EException.

EPointCloud.GetAttributeBuffer

Retrieves a pointer to the internal attribute buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetAttributeBuffer(
 int attribute
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

Remarks

If the attribute has not been initialized, it throws an EException.

EPointCloud.GetAttributeBufferType

Returns the EAttributeType corresponding to the E3DAttribute.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EAttributeType GetAttributeBufferType(
 int attribute
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

EPointCloud.GetInitializedAttributes

Fills the vector with the ids (in growing order) of all the attributes that have been initialized.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetInitializedAttributes(
 ref int[] attributes
 )
```

Parameters

attributes

The vector that will contain the initialized attributes id.

EPointCloud.GetPoint

Retrieves a point from the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint GetPoint(
 uint index
 )
```

Parameters

index

Index of the point to be retrieved.

EPointCloud.HasAttributeBuffer

Returns true if a buffer of the given E3DAttribute exists in the point cloud

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool HasAttributeBuffer(
 int attribute
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

EPointCloud.Load

Loads the EPointCloud. Supported formats are Open eVision proprietary, CSV, OBJ, PCD, PLY and XYZ. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is read from.

EPointCloud.LoadCSV

Loads an EPointCloud stored in the CSV (Comma-Separated Values) file format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void LoadCSV(
 string path
 )

void LoadCSV(
 string path,
 Euresys.Open_eVision.EFloatRange undefinedZValues
 )
```

Parameters

path

The full path of the input file.

undefinedZValues

Optional parameter, discard the points with Z value in the given range.

Remarks

Only the x,y,z coordinates of the points of the pointcloud are loaded. Use pcd or ply if you need more.
There is no standard for pointcloud in CSV file format. To be correctly read, the file needs to have at least the components (x, y, z) and each value must be separated by a comma.
An acceptable file could be:
x, y, z
x1, y1, z1
x2, y2, z2
x3, y3, z3
Other components can be in the file and the order of the elements may differs from the example as long as it is defined in the header. Note that files containing series of profile frames (i.e. only containing z-values) are not supported.
Use EPointCloud::SaveCSV to save to CSV file.

EPointCloud.LoadOBJ

Loads an EPointCloud stored in the OBJ file format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadOBJ(
 string path
 )
void LoadOBJ(
 string path,
 Euresys.Open_eVision.EFloatRange undefinedZValues
 )
```

Parameters

path

The full path of the input file.

undefinedZValues

Optional parameter, discard the points with Z value in the given range.

Remarks

The OBJ file format is documented here:
https://www.fileformat.info/format/wavefrontobj/egff.htm.
The only attribute loaded in the obj file format is the normals. Use pcd or ply if you need more.
Use EPointCloud::SaveOBJ to save to OBJ file.

EPointCloud.LoadPCD

Loads an EPointCloud stored in the PCD (Point Cloud Library) file format.
ASCII and binary formats are compatible.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void LoadPCD(
 string path
 )

void LoadPCD(
 string path,
 Euresys.Open_eVision.EFloatRange undefinedZValues
 )
```

Parameters

path

The full path of the input file.

undefinedZValues

Optional parameter, discard the points with Z value in the given range.

Remarks

The PCD file format is documented here:
http://pointclouds.org/documentation/tutorials/pcd_file_format.html.
When loading PCD files:
- columns where the field COUNT is not set to 1 are ignored
- in ascii files, all numbers are assumed to be written in base 10
- file is assumed to contain at least the floating point fields x, y and z. They mustn't be the first but have to be consecutive. If one of these points is nan, inf or too big to be represented on a float, the line is ignored. These points can be double but are stored internally as float.
- the other columns are loaded as user-custom attributes unless they match the specifications of our particular attributes
- a column representing a color must have as suffix "_C" and be of type uint32 or float, they are bitwise encoded as a combination of uint8 in the form argb (uint32) or _rgb (float). Otherwise it is loaded as an uint32/float column.
- columns representing an E3DPoint must have as suffixes "_x", "_y", "_z", be consecutive and of float/double type. They are stored as float in both cases. Otherwise they are loaded as 3 float/double columns.
- we do not have internal int16 or int8 types so those are converted to int32 types.
The particular attributes we define and the conditions to be parsed as one are:
- E3DAttribute_Color: name must be rgb (in which case alpha is not read and set to 255) or rgba, encoding must correspond to a color.
- E3DAttribute_Normal: names must be (normal_x, normal_y and normal_z) or (nx, ny and nz), encoding must correspond to a point.
- E3DAttribute_Intensity: name must be intensity, intensity must be a numeric type.
- E3DAttribute_Texture: name must be texture (with corresponding suffixes if type is color or point).
- E3DAttribute_Index: name must be index and type uint32 or int32.
- E3DAttribute_Confidence: name must be confidence and type should be float or double (but is converted internally to float).
- E3DAttribute_Distance: name must be distance and type should be float or double (but is converted internally to float).
Use EPointCloud::SavePCD to save to PCD file.

EPointCloud.LoadPLY

Loads an EPointCloud stored in the PLY file format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void LoadPLY(
 string path
 )
```

```
void LoadPLY(
 string path,
 Euresys.Open_eVision.EFloatRange undefinedZValues
 )
```

Parameters

path

The full path of the input file.

undefinedZValues

Optional parameter, discard the points with Z value in the given range.

Remarks

The PLY file format is documented here: http://paulbourke.net/dataformats/ply/.
When loading PLY files:
- in ascii files, all numbers are assumed to be written in base 10
- file is assumed to contain at least the floating point fields x, y and z. They mustn't be the first but have to be consecutive. If one of these points is nan, inf or too big to be represented on a float, the line is ignored. These points can be double but are stored internally as float.
- the other columns are loaded as user-custom attributes unless they match the specifications of our particular attributes
- the 3(4) columns representing a color must be of type uchar and end with _red, _green, _blue (, _alpha). They must be consecutive and in the red, green, blue (alpha) order.
- columns representing an E3DPoint must have as suffixes "_x", "_y", "_z", be consecutive and of float type. They are stored as float in both cases. Otherwise they are loaded as 3 float columns.
- we do not have internal int16 or int8 types so those are converted to int32 types.
The particular attributes we define and the conditions to be parsed as one are:
- E3DAttribute_Color: names must be red, green, blue (alpha), encoding must correspond to a color.
- E3DAttribute_Normal: names must be (nx, ny and nz) or (normal_x, normal_y and normal_z), encoding must correspond to a point.
- E3DAttribute_Intensity: name must be intensity, intensity must be a numeric type.
- E3DAttribute_Texture: name must be texture (with corresponding suffixes if type is color or point).
- E3DAttribute_Index: name must be index and type uint32 or int32.
- E3DAttribute_Confidence: name must be confidence and type should be float or double (but is converted internally to float).
- E3DAttribute_Distance: name must be distance and type should be float or double (but is converted internally to float).
Use EPointCloud::SavePLY to save to PLY file.

EPointCloud.LoadXYZ

Loads an EPointCloud stored in the XYZ file format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void LoadXYZ(
 string path
 )
void LoadXYZ(
 string path,
 Euresys.Open_eVision.EFloatRange undefinedZValues
 )
```

Parameters

path

The full path of the input file.

undefinedZValues

Optional parameter, discard the points with Z value in the given range.

Remarks

Only the x,y,z coordinates of the points of the pointcloud are loaded. Use pcd or ply if you need more. Use EPointCloud::SaveXYZ to save to XYZ file.

EPointCloud.NumPoints

Number of points in the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumPoints
  { get; }
```

EPointCloud.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloud operator=(
 Euresys.Open_eVision.Easy3D.EPointCloud other
 )
```

Parameters

other

The EPointCloud object that should be copied.

EPointCloud.PointsBuffer

Retrieves a pointer to the internal points buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr PointsBuffer
  { get; }
```

EPointCloud.PrepareSpacePartition

Enables the build of the space partition (like EPointCloud) and builds it now instead of when it is first needed. The computation time of the space partition depends on the number of points in the point cloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void PrepareSpacePartition(
 )
```

Remarks

See also EPointCloud::EnableSpacePartition.

EPointCloud.RemovePoint

Removes a point and its corresponding attributes from the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void RemovePoint(
 uint index
 )
```

Parameters

index

The index of the point to remove.

EPointCloud.Save

Saves the EPointCloud. Supported formats are Open eVision proprietary, CSV, OBJ, PCD, PLY and XYZ. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EPointCloud.SaveCSV

Saves the EPointCloud in the CSV (Comma-Separated Values) file format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveCSV(
 string path
 )
```

Parameters

path

The full path of the destination file.

Remarks

Only the x,y,z coordinates of the points of the pointcloud are saved. Use pcd or ply if you need more. Use EPointCloud::LoadCSV to load from CSV file.

EPointCloud.SaveOBJ

Saves the EPointCloud in the OBJ file format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveOBJ(
 string path
 )
```

Parameters

path

The full path of the destination file.

Remarks

The OBJ file format is documented here:
https://www.fileformat.info/format/wavefrontobj/egff.htm.
The only attribute saved in the obj file format is the normals. Use pcd or ply if you need more.
Use EPointCloud::LoadOBJ to load from OBJ file.

EPointCloud.SavePCD

Saves the EPointCloud in the PCD (Point Cloud Library) file format.
ASCII and binary formats are available.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SavePCD(
 string path,
 bool binary
 )
```

Parameters

path

The full path of the destination file.

binary

Whether to store the file in binary instead of ascii, defaults to true.

Remarks

The PCD file format is documented here:
http://pointclouds.org/documentation/tutorials/pcd_file_format.html.
Custom user fields are named custom0, custom1,...
Colors are saved as an uint32_t (alpha, red, green, blue) and custom attributes' names are suffixed with _C. Points are saved as 3 consecutive floats and custom attributes' names are suffixed with _x, _y, _z.
Use EPointCloud::LoadPCD to load from PCD file.

EPointCloud.SavePLY

Saves the EPointCloud in the PLY file format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SavePLY(
 string path,
 bool binary
 )
```

Parameters

path

The full path of the destination file.

binary

Whether to store the file in binary instead of ascii, defaults to true.

Remarks

The PLY file format is documented here: http://paulbourke.net/dataformats/ply/.
Custom user fields are named custom0, custom1,...
Colors are saved as 4 uchar fields suffixed with (_red, _green, _blue, _alpha) for custom attributes or named (red, green, blue, alpha) for the pointcloud's color attribute.
Points are saved as 3 consecutive floats whose names are suffixed with _x, _y, _z.
Use EPointCloud::LoadPLY to load from PLY file.

EPointCloud.SaveXYZ

Saves the EPointCloud in the XYZ file format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveXYZ(
 string path
 )
```

Parameters

path

The full path of the destination file.

Remarks

Only the x,y,z coordinates of the points of the pointcloud are saved. Use pcd or ply if you need more. Use EPointCloud::LoadXYZ to load from XYZ file.

EPointCloud.SetAttribute

Sets the corresponding attribute at the given index.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetAttribute(
 int attribute,
 uint index,
 byte value
 )

void SetAttribute(
 int attribute,
 uint index,
 ushort value
 )

void SetAttribute(
 int attribute,
 uint index,
 uint value
 )

void SetAttribute(
 int attribute,
 uint index,
 int value
 )

void SetAttribute(
 int attribute,
 uint index,
 float value
 )

void SetAttribute(
 int attribute,
 uint index,
 double value
 )

void SetAttribute(
 int attribute,
 uint index,
 Euresys.Open_eVision.EC24A value
 )

void SetAttribute(
 int attribute,
 uint index,
 Euresys.Open_eVision.Easy3D.E3DPoint value
 )
```

Parameters

attribute

The attribute buffer id. Either an E3DAttribute or an id returned by EPointCloud::AddCustomAttributeBuffer.

index

The index of the element.

value

The new value of the element.

Remarks

This function does not perform an allocation. To add a new point with some attributes in the EPointCloud, use functions EPointCloud::AddPoint or EPointCloud::AddPoints which will add default value(s) to the attribute buffers that are initialized. Then, they can be set with this function. If the attribute has not been initialized or if the index is out of bound, it throws an EException.

4.187. EPointCloudFactory Class

Manages a context for creating point clouds of specific shapes.

Namespace: Euresys.Open_eVision.Easy3D

Methods

CreateCubicPointCloud	Creates a point cloud in the shape of a cube.
CreateRectangularPointCloud	Creates a point cloud in the shape of a rectangular parallelepiped.
CreateSphericPointCloud	Creates a point cloud in the shape of a sphere.

EPointCloudFactory.CreateCubicPointCloud

Creates a point cloud in the shape of a cube.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPointCloud CreateCubicPointCloud(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float size,
 float roll,
 float pitch,
 float yaw,
 uint numSamples
 )
```

Parameters

center
Center of the cube.
size
Edge size of the cube.
roll
Roll (rotation along the X axis) of the cube.
pitch
Pitch (rotation along the Y axis) of the cube.
yaw
Yaw (rotation along the Z axis) of the cube.
numSamples
Number of points along each edge of the cube.

EPointCloudFactory.CreateRectangularPointCloud

Creates a point cloud in the shape of a rectangular parallelepiped.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloud CreateRectangularPointCloud(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float width,
 float height,
 float depth,
 float roll,
 float pitch,
 float yaw,
 uint numSamples
 )
```

Parameters

center
Center of the rectangular parallelepiped.
width
Width (size along the X axis before rotation) of the rectangular parallelepiped.
height
Height (size along the Y axis before rotation) of the rectangular parallelepiped.
depth
Depth (size along the Z axis before rotation) of the rectangular parallelepiped.
roll
Roll (rotation along the X axis) of the rectangular parallelepiped.
pitch
Pitch (rotation along the Y axis) of the rectangular parallelepiped.

yaw
Yaw (rotation along the Z axis) of the rectangular parallelepiped.
numSamples
Number of points along each edge of the rectangular parallelepiped.

EPointCloudFactory.CreateSphericPointCloud

Creates a point cloud in the shape of a sphere.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPointCloud CreateSphericPointCloud(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float radius,
 int numCircles,
 int numSamples
 )
```

Parameters

center
Center of the sphere.
radius
Radius of the sphere.
numCircles
Number of parallels and meridians to be rendered.
numSamples
Number of points along each meridian and parallel.

4.188. EPointCloudFilter Class

An EPointCloudFilter is used to filter some points out of an EPointCloud.
The points to filter out are selected according to a criteria (see EPointCloudFilteringMethod) based on their neighborhood.

Namespace: Euresys.Open_eVision.Easy3D

Properties

FilteringMethod	Sets/Gets the filtering method.
NumberOfNeighbors	Sets/Gets the number of neighbors.
ReplaceByAverage	Sets/Gets whether to replace filtered points by their average.
ThresholdMultiplier	Sets/Gets the filtering threshold multiplier.

Methods

EPointCloudFilter	Creates an EPointCloudFilter object to filter out some points in an EPointCloud.
Filter	Filters the input point cloud and puts the result of the operation in the output point cloud.
Load	Loads the EPointCloudFilter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the EPointCloudFilter configuration. The given ESerializer must have been created for writing.

EPointCloudFilter.EPointCloudFilter

Creates an EPointCloudFilter object to filter out some points in an EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EPointCloudFilter(
 float thresholdMultiplier,
 uint numberOfNeighbors,
 Euresys.Open_eVision.Easy3D.EPointCloudFilteringMethod method,
 bool replaceByAverage
 )
void EPointCloudFilter(
 Euresys.Open_eVision.Easy3D.EPointCloudFilter other
 )
```

Parameters

thresholdMultiplier

Points whose criterion is greater than mean + thresholdMultiplier * stddev are removed, mean and stddev being the mean and standard derivation of the criterion across all points of the cloud. Default: 1.

numberOfNeighbors

Number of neighbors in the neighborhood used to determine if a point is filtered or not. Default: 10

method

EPointCloudFilteringMethod used to select the points to filter. Default: HighStandardDerivation.

replaceByAverage

Set to true to replace points to filter out by the mean of their neighborhood instead of removing them. Default: false

other

The point cloud filterer we copy from.

EPointCloudFilter.Filter

Filters the input point cloud and puts the result of the operation in the output point cloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Filter(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut
 )
```

Parameters

cloudIn

Input point cloud that will be filtered

cloudOut

Output point cloud that has been filtered

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

EPointCloudFilter.FilteringMethod

Sets/Gets the filtering method.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EPointCloudFilteringMethod FilteringMethod
  { get; set; }
```

EPointCloudFilter.Load

Loads the EPointCloudFilter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is read from

EPointCloudFilter.NumberOfNeighbors

Sets/Gets the number of neighbors.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
uint NumberOfNeighbors
  { get; set; }
```

EPointCloudFilter.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloudFilter operator=(
 Euresys.Open_eVision.Easy3D.EPointCloudFilter other
 )
```

Parameters

other
An other EPointCloudFilter.

EPointCloudFilter.ReplaceByAverage

Sets/Gets whether to replace filtered points by their average.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ReplaceByAverage
  { get; set; }
```

EPointCloudFilter.Save

Saves the EPointCloudFilter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to

EPointCloudFilter.ThresholdMultiplier

Sets/Gets the filtering threshold multiplier.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float ThresholdMultiplier
  { get; set; }
```

4.189. EPointCloudMerger Class

Merges several EPointCloud of the same scene from different sensors after having performed a calibration.

Namespace: Euresys.Open_eVision.Easy3D

Properties

EnableDecimation	Sets/Gets whether the filtering of the merged cloud is enabled. If set to true, an EGridDecimator is used to perform a grid decimation so that a point present in several clouds is not duplicated.
MergedCloudResolution	Sets/Gets the resolution of the merged point clouds.

Transformations	Sets/Gets the transformations to apply to all of the clouds to merge.

Methods

Calibrate	Calibrates the transformations to apply to the point clouds from clouds of the calibration object.
EPointCloudMerger	Constructs an EPointCloudMerger.
Load	Loads the EPointCloudMerger. The given ESerializer must have been created for reading.
Merge	Merges the given clouds by applying the transformation matrices and optionally filter the result to remove duplicate points.
operator=	Assignment operator.
Save	Saves the EPointCloudMerger. The given ESerializer must have been created for writing.

EPointCloudMerger.Calibrate

Calibrates the transformations to apply to the point clouds from clouds of the calibration object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Calibrate(
 Euresys.Open_eVision.Easy3D.EPointCloud[] calibrationClouds,
 float calibrationObjectSize,
 bool computeMergedCloudResolution
 )
```

Parameters

calibrationClouds

A vector of EPointCloud representing different points of view of the calibration object.

calibrationObjectSize

The size of an edge of the calibration cube in the point clouds.

computeMergedCloudResolution

Whether to compute the resolution of the merged cloud from the given clouds or not. If set to true, the resolution will be set to half the average distance between a point on the calibration object of the first cloud and its nearest neighbor.

Remarks

The transformations to apply and possibly the mergedCloudResolution can also be set by EPointCloudMerger::Transformations and EPointCloudMerger::MergedCloudResolution respectively.
The biggest face of the calibration cube should at least contain 2% of the points in each calibration cloud for the object to be detected.

EPointCloudMerger.EnableDecimation

Sets/Gets whether the filtering of the merged cloud is enabled. If set to true, an EGridDecimator is used to perform a grid decimation so that a point present in several clouds is not duplicated.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool EnableDecimation
  { get; set; }
```

EPointCloudMerger.EPointCloudMerger

Constructs an EPointCloudMerger.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EPointCloudMerger(
 )
void EPointCloudMerger(
 Euresys.Open_eVision.Easy3D.EPointCloudMerger other
 )
void EPointCloudMerger(
 bool enableDecimation,
 float mergedCloudResolution,
 Euresys.Open_eVision.Easy3D.E3DTransformMatrix[] transforms
 )
```

Parameters

other

Another EPointCloudMerger object to be copied in the new EPointCloudMerger object.

enableDecimation

Whether we want to filter the merged cloud to remove point duplicates coming from different clouds by using an EGridDecimator or not. Set to true by default.

mergedCloudResolution

The size of a cubic cell of EGridDecimator applied to the merged EPointCloud. Set to 1 by default.

transforms

A vector of E3DTransformMatrix that will be applied to each EPointCloud before merging them together.

EPointCloudMerger.Load

Loads the EPointCloudMerger. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPointCloudMerger.Merge

Merges the given clouds by applying the transformation matrices and optionally filter the result to remove duplicate points.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Merge(
 Euresys.Open_eVision.Easy3D.EPointCloud[] clouds,
 Euresys.Open_eVision.Easy3D.EPointCloud mergedCloud
 )
```

Parameters

clouds

-

mergedCloud

An empty cloud that will be filled with the merging of the calibrationClouds. Useful to manually assess the results.

Remarks

The EPointCloudMerger must have been calibrated or the transformations to apply set, see EPointCloudMerger::Calibrate, EPointCloudMerger or constructor.

EPointCloudMerger.MergedCloudResolution

Sets/Gets the resolution of the merged point clouds.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MergedCloudResolution
  { get; set; }
```

EPointCloudMerger.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloudMerger operator=(
 Euresys.Open_eVision.Easy3D.EPointCloudMerger other
 )
```

Parameters

other

The EPointCloudMerger object that should be assigned.

EPointCloudMerger.Save

Saves the EPointCloudMerger. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EPointCloudMerger.Transformations

Sets/Gets the transformations to apply to all of the clouds to merge.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DTransformMatrix[] Transformations
  { get; set; }
```

Remarks

The transformations to apply can also be produced by EPointCloudMerger::Calibrate.

4.190. EPointCloudStatistics Class

Manages a context for retrieving statistics on an EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

Methods

GetPointCloudBounds	Retrieves the bounds of an EPointCloud.
GetPointCloudCentroid	Retrieves the centroid (arithmetic mean position of all the points, also known as center of gravity or barycenter) of an EPointCloud. It is possible to get the centroid of a sphere or a rectangle (rectangular parallelepiped) shape inside the point cloud. The sphere is defined by it's center and radius, in the EPointCloud coordinate system. The 3D rectangle is defined by 3 ranges, in X, Y and Z axis, in the EPointCloud coordinate system. An exception will be thrown if no point is present in the shape or the point cloud.

EPointCloudStatistics.GetPointCloudBounds

Retrieves the bounds of an EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetPointCloudBounds(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.EFloatRange rangeX,
 Euresys.Open_eVision.EFloatRange rangeY,
 Euresys.Open_eVision.EFloatRange rangeZ
 )
```

Parameters

cloud
Point cloud.

rangeX
Bounds of the point cloud along the X direction.

rangeY
Bounds of the point cloud along the Y direction.

rangeZ
Bounds of the point cloud along the Z direction.

EPointCloudStatistics.GetPointCloudCentroid

Retrieves the centroid (arithmetic mean position of all the points, also known as center of gravity or barycenter) of an EPointCloud.
It is possible to get the centroid of a sphere or a rectangle (rectangular parallelepiped) shape inside the point cloud.
The sphere is defined by it's center and radius, in the EPointCloud coordinate system.
The 3D rectangle is defined by 3 ranges, in X, Y and Z axis, in the EPointCloud coordinate system.
An exception will be thrown if no point is present in the shape or the point cloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint GetPointCloudCentroid(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud
 )

Euresys.Open_eVision.Easy3D.E3DPoint GetPointCloudCentroid(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.E3DPoint sphereCenter,
 float sphereRadius
 )

Euresys.Open_eVision.Easy3D.E3DPoint GetPointCloudCentroid(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.EFloatRange rangeX,
 Euresys.Open_eVision.EFloatRange rangeY,
 Euresys.Open_eVision.EFloatRange rangeZ
 )
```

Parameters

cloud
Point cloud.
sphereCenter
The position of the center of the sphere.
sphereRadius
The radius of the sphere.
rangeX
The bounds along the X direction.
rangeY
The bounds along the Y direction.
rangeZ
The bounds along the Z direction.

4.191. EPointCloudToMeshConverter Class

Performs the conversion from an EPointCloud to an EMesh.

Namespace: Euresys.Open_eVision.Easy3D

Properties

MaxEdgeLength	Sets/Gets the maximal length of the longest edge of a triangle of the mesh. Larger triangles will be filtered out. A value of 0 does not perform any filtering. Set to 0 by default.
ProjectionPlane	The plane on which the cloud is projected before generating a mesh. The parts of the object behind the plane are ignored. Set to the "z = 0" plane by default.
Resolution	Approximate size of a side of a triangle composing the mesh, set to 0 to have the value automatically computed.

Methods

Convert	The method 'Convert' performs the conversion from an EPointCloud to an EMesh. The cloud is first projected on a Plane from which the mesh is generated. This method is thus expecting 2.5D point clouds.
EPointCloudToMeshConverter	Creates an EPointCloudToMeshConverter object.
Load	Loads the converter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator
Save	Saves the converter configuration. The given ESerializer must have been created for writing.

EPointCloudToMeshConverter.Convert

The method 'Convert' performs the conversion from an EPointCloud to an EMesh. The cloud is first projected on a Plane from which the mesh is generated. This method is thus expecting 2.5D point clouds.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Convert(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EMesh mesh
 )
```

Parameters

cloud

The cloud to convert.

mesh

The destination mesh.

EPointCloudToMeshConverter.EPointCloudToMeshConverter

Creates an EPointCloudToMeshConverter object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EPointCloudToMeshConverter(
 )
void EPointCloudToMeshConverter(
 Euresys.Open_eVision.Easy3D.EPointCloudToMeshConverter other
 )
```

Parameters

other

Reference to the EPointCloudToMeshConverter object used for the initialization.

EPointCloudToMeshConverter.Load

Loads the converter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPointCloudToMeshConverter.MaxEdgeLength

Sets/Gets the maximal length of the longest edge of a triangle of the mesh. Larger triangles will be filtered out. A value of 0 does not perform any filtering. Set to 0 by default.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MaxEdgeLength
  { get; set; }
```

EPointCloudToMeshConverter.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloudToMeshConverter operator=(
 Euresys.Open_eVision.Easy3D.EPointCloudToMeshConverter other
 )
```

Parameters

other

Reference to the EPointCloudToMeshConverter object used for the assignment.

EPointCloudToMeshConverter.ProjectionPlane

The plane on which the cloud is projected before generating a mesh. The parts of the object behind the plane are ignored. Set to the "z = 0" plane by default.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPlane ProjectionPlane
  { get; set; }
```

EPointCloudToMeshConverter.Resolution

Approximate size of a side of a triangle composing the mesh, set to 0 to have the value automatically computed.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float Resolution
  { get; set; }
```

EPointCloudToMeshConverter.Save

Saves the converter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
: The file path.

serializer
: Pointer to the ESerializer created for writing.

4.192. EPointCloudToZMapConverter Class

Computes an EZMap from an EPointCloud. The value of the pixels of the ZMap are the distance between the 3D points and the reference plane.
All 3D points under the reference plane are discarded.
Various options can be set with methods EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::SetFillMode, EPointCloudToZMapConverter::SetMapXYResolution, EPointCloudToZMapConverter::MapZResolution, EPointCloudToZMapConverter::OrientationVector...
When the conversion is called without defining specific parameters, the algorithm uses the following options:
- The reference plane is the horizontal plane.
- The orientation vector is selected automatically.
- The origin is set as the lowest left position of the projected point cloud on the reference plane.
- The resolution (the dimensions of the Z map) is estimated to have approximately one Point Cloud point per ZMap pixels.
- The scale is calculated from the point cloud ranges and the estimated resolution.
- The fill mode is enabled and the method is set to 'EFillUndefinedPixelsDirection_Local' (see method EDepthMap8::FillUndefinedPixels).

Namespace: Euresys.Open_eVision.Easy3D

Properties

Extension	Sets a metric value used to enlarge the point cloud 3D domain. That value affects X,Y and Z directions and can be used to generate an EZMap with borders of undefined pixels. Default value is 0, which means a ZMap without border.
FillUndefinedPixelsDirection	Gets the undefined pixel fill direction (see EFillUndefinedPixelsDirection).
FillUndefinedPixelsMethod	Gets the undefined pixel fill method (see EFillUndefinedPixelsMethod).
MapHeight	Gets the required height (number of pixels) of the generated EZMap. By default, the required size is not set.
MapWidth	Gets the required width (number of pixels) of the generated EZMap. By default, the required size is not set.
MapXResolution	Gets the resolution of the EZMap pixels along the X axis.
MapYResolution	Gets the resolution of the EZMap pixels along the Y axis.
MapZResolution	Gets/sets the EZMap Z resolution, in world space units per gray value. The resolution is used to compute the transformation of the world Z position to an integer 8, 16 or 32 bits pixel value.
OrientationVector	Sets an explicit orientation for the EZMap. Overrides the orientation mode given by the method EPointCloudToZMapConverter::OrientationVectorMode.

OrientationVectorMode	Chooses the EZMap orientation from a list of predefined axis, automatic mode or user defined vector. Use EPointCloudToZMapConverter::OrientationVector to set an explicit orientation vector for the ZMap.
Origin	Chooses the EZMap origin. It is the 3D world position used as origin of the ZMap upper left pixel (0,0).
ReferencePlane	Sets the E3DPlane reference plane. The resulting EZMap is the distance of the 3D points above that plane. 3D points below the reference plane are discarded.
ReferencePlaneMode	Sets an axis aligned reference plane. Overrides the explicit reference plane given by the method EPointCloudToZMapConverter::ReferencePlane.
WorldToZMapTransform	Explicitly sets the world to ZMap transformation. EPointCloudToZMapConverter::WorldToZMapTransform overrides the settings done by EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::OrientationVector and EPointCloudToZMapConverter::Origin. That E3DTransformMatrix transform expresses how the world positions are transformed to the EZMap space. The matrix must be a rigid transformation (translation and rotation only). The resolutions of the ZMap are defined by the EPointCloudToZMapConverter::SetMapXYResolution and EPointCloudToZMapConverter::MapZResolution methods.
ZMaptoWorldTransform	Explicitly sets the ZMap to World transformation. "SetZMaptoWorldTransform" overrides the settings done by EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::OrientationVector and EPointCloudToZMapConverter::Origin. That E3DTransformMatrix transform expresses how the EZMap positions are transformed to the World space. The matrix must be a rigid transformation (translation and rotation only). The resolutions of the World are defined by the EPointCloudToZMapConverter::SetMapXYResolution and EPointCloudToZMapConverter::MapZResolution methods.

Methods

Convert	Computes an EZMap from a world space EPointCloud. The value of the pixels of the ZMap are the distance between the 3D points and the reference plane. Various options can be set with methods EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::OrientationVector, EPointCloudToZMapConverter::SetMapSize, ...
EnableFillMode	Enables or disables fill mode. Fill mode parameters are defined by method EPointCloudToZMapConverter::SetFillMode or EPointCloudToZMapConverter::SetFillModeMedian. Fill mode is enabled by default. If fill mode is disable, undefined pixels may remain in the EZMap.

EPointCloudToZMapConverter	Creates an EPointCloudToZMapConverter object.
IsFillModeEnabled	Tells if the fill mode is enabled or not. Use EPointCloudToZMapConverter::EnableFillMode to toggle the fill mode and EPointCloudToZMapConverter::SetFillMode or EPointCloudToZMapConverter::SetFillModeMedian to set the filling parameters.
Load	Loads the converter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator
operator==	Comparison operator
Save	Saves the converter configuration. The given ESerializer must have been created for writing.
SetFillMode	Inpainting options used to fill the "holes" in the EZMap. A hole exists when no 3D point is projected at that pixel position in the ZMap.
SetFillModeMedian	Inpainting options used to fill the "holes" in the EZMap using a median rectangular kernel of odd size. A hole exists when no 3D point is projected at that pixel position in the ZMap.
SetMapSize	Sets the required size of the generated EZMap; expressed in number of pixels for width and height dimensions. By default, the required size is not set.
SetMapXYResolution	Sets the resolution (possibly anisotropic) of the EZMap pixels along the X and Y axes, in world space units per pixel (e.g mm/pixel). The resolution is used to compute the ZMap size (width and height), depending on the projected point cloud on the reference plane.
UnsetMapSize	Unsets the resolution. Lets the conversion decides for the optimum resolution, depending on the projected point cloud and pixel scale.
UnsetMapXYResolution	Unsets the X and Y resolutions. Lets the conversion decide the optimal resolution, depending on the projected point cloud and EZMap size.
UnsetMapZResolution	Unsets the ZMap Z resolution. Lets the conversion decide the optimal Z resolution.
UnsetOrigin	Lets the conversion process decides for the EZMap origin position (based on projected point cloud on the reference plane). Use EPointCloudToZMapConverter::Origin to enable and choose the ZMap origin.
UnsetWorldToZMapTransform	Disables the explicit world to ZMap transformation, set with EPointCloudToZMapConverter::WorldToZMapTransform.

EPointCloudToZMapConverter.Convert

Computes an EZMap from a world space EPointCloud. The value of the pixels of the ZMap are the distance between the 3D points and the reference plane. Various options can be set with methods EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::OrientationVector, EPointCloudToZMapConverter::SetMapSize, ...

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Convert(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EZMap8 zmap
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EZMap16 zmap
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EZMap32f zmap
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EPointCloud cloud,
 Euresys.Open_eVision.Easy3D.EZMap zmap
 )
```

Parameters

cloud

The input 3D point cloud.

zmap

The generated ZMap in 8, 16 or 32 bits format.

EPointCloudToZMapConverter.EnableFillMode

Enables or disables fill mode. Fill mode parameters are defined by method EPointCloudToZMapConverter::SetFillMode or EPointCloudToZMapConverter::SetFillModeMedian.
Fill mode is enabled by default. If fill mode is disable, undefined pixels may remain in the EZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EnableFillMode(
 bool state
 )
```

Parameters

state

Set to true to enable fill mode.

EPointCloudToZMapConverter.EPointCloudToZMapConverter

Creates an EPointCloudToZMapConverter object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EPointCloudToZMapConverter(
 )
void EPointCloudToZMapConverter(
 Euresys.Open_eVision.Easy3D.EPointCloudToZMapConverter other
 )
```

Parameters

other

Reference to the EPointCloudToZMapConverter object used for the initialization.

EPointCloudToZMapConverter.Extension

Sets a metric value used to enlarge the point cloud 3D domain.
That value affects X,Y and Z directions and can be used to generate an EZMap with borders of undefined pixels.
Default value is 0, which means a ZMap without border.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Extension
  { get; set; }
```

EPointCloudToZMapConverter.FillUndefinedPixelsDirection

Gets the undefined pixel fill direction (see EFillUndefinedPixelsDirection).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection FillUndefinedPixelsDirection
  { get; }
```

EPointCloudToZMapConverter.FillUndefinedPixelsMethod

Gets the undefined pixel fill method (see EFillUndefinedPixelsMethod).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod FillUndefinedPixelsMethod
  { get; }
```

EPointCloudToZMapConverter.IsFillModeEnabled

Tells if the fill mode is enabled or not.
Use EPointCloudToZMapConverter::EnableFillMode to toggle the fill mode and EPointCloudToZMapConverter::SetFillMode or EPointCloudToZMapConverter::SetFillModeMedian to set the filling parameters.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsFillModeEnabled(
 )
```

EPointCloudToZMapConverter.Load

Loads the converter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EPointCloudToZMapConverter.MapHeight

Gets the required height (number of pixels) of the generated EZMap.
By default, the required size is not set.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int MapHeight
  { get; }
```

EPointCloudToZMapConverter.MapWidth

Gets the required width (number of pixels) of the generated EZMap.
By default, the required size is not set.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int MapWidth
  { get; }
```

EPointCloudToZMapConverter.MapXResolution

Gets the resolution of the EZMap pixels along the X axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MapXResolution
  { get; }
```

EPointCloudToZMapConverter.MapYResolution

Gets the resolution of the EZMap pixels along the Y axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MapYResolution
  { get; }
```

EPointCloudToZMapConverter.MapZResolution

Gets/sets the EZMap Z resolution, in world space units per gray value.
The resolution is used to compute the transformation of the world Z position to an integer 8, 16 or 32 bits pixel value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MapZResolution
  { get; set; }
```

EPointCloudToZMapConverter.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPointCloudToZMapConverter operator=(
 Euresys.Open_eVision.Easy3D.EPointCloudToZMapConverter other
 )
```

Parameters

other

Reference to the EPointCloudToZMapConverter object used for the assignment.

EPointCloudToZMapConverter.operator==

Comparison operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator==(
 Euresys.Open_eVision.Easy3D.EPointCloudToZMapConverter other
 )
```

Parameters

other

Reference to the EPointCloudToZMapConverter object used for the comparison.

EPointCloudToZMapConverter.OrientationVector

Sets an explicit orientation for the EZMap.
Overrides the orientation mode given by the method EPointCloudToZMapConverter::OrientationVectorMode.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint OrientationVector
```

```
{ get; set; }
```

Remarks

The direction should be an E3DPoint representing the expected direction of the X (width) axis of the ZMap.
That direction will be used after projection on the reference plane normal.
That direction must NOT be aligned with the reference plane normal.

EPointCloudToZMapConverter.OrientationVectorMode

Chooses the EZMap orientation from a list of predefined axis, automatic mode or user defined vector.
Use EPointCloudToZMapConverter::OrientationVector to set an explicit orientation vector for the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EZMapOrientationVectorMode OrientationVectorMode
{ get; set; }
```

Remarks

Choose between Automatic mode (default), world space axis or explicit user defined vector (see EZMapOrientationVectorMode).

EPointCloudToZMapConverter.Origin

Chooses the EZMap origin. It is the 3D world position used as origin of the ZMap upper left pixel (0,0).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint Origin
{ get; set; }
```

Remarks

That position will be projected on the reference plane.
To let the conversion chooses for the origin, call EPointCloudToZMapConverter::UnsetOrigin.

EPointCloudToZMapConverter.ReferencePlane

Sets the E3DPlane reference plane.
The resulting EZMap is the distance of the 3D points above that plane.
3D points below the reference plane are discarded.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPlane ReferencePlane
  { get; set; }
```

EPointCloudToZMapConverter.ReferencePlaneMode

Sets an axis aligned reference plane.
Overrides the explicit reference plane given by the method EPointCloudToZMapConverter::ReferencePlane.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EZMapReferencePlaneMode ReferencePlaneMode
  { get; set; }
```

Remarks

Choose between X, Y or Z reference plane (see EZMapReferencePlaneMode).
The plane offset is set automatically on the point cloud lowest 3D point.

EPointCloudToZMapConverter.Save

Saves the converter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
Pointer to the ESerializer created for writing.

EPointCloudToZMapConverter.SetFillMode

Inpainting options used to fill the "holes" in the EZMap. A hole exists when no 3D point is projected at that pixel position in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFillMode(
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

direction

Direction in which the undefined pixels are filled in a depthmap from EFillUndefinedPixelsDirection

method

Which values used to fill the undefined pixels in a depthmap from EFillUndefinedPixelsMethod

EPointCloudToZMapConverter.SetFillModeMedian

Inpainting options used to fill the "holes" in the EZMap using a median rectangular kernel of odd size. A hole exists when no 3D point is projected at that pixel position in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetFillModeMedian(
 uint halfKernelX,
 uint halfKernelY
 )
```

Parameters

halfKernelX

-

halfKernelY

-

EPointCloudToZMapConverter.SetMapSize

Sets the required size of the generated EZMap; expressed in number of pixels for width and height dimensions.
By default, the required size is not set.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetMapSize(
 int width,
 int height
 )
```

Parameters

width

The required width for the Generated ZMap.

height

The required height for the Generated ZMap.

EPointCloudToZMapConverter.SetMapXYResolution

Sets the resolution (possibly anisotropic) of the EZMap pixels along the X and Y axes, in world space units per pixel (e.g mm/pixel).
The resolution is used to compute the ZMap size (width and height), depending on the projected point cloud on the reference plane.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetMapXYResolution(
 float resolution
 )
void SetMapXYResolution(
 float resolutionX,
 float resolutionY
 )
```

Parameters

resolution

The resolution for the isotropic case.

resolutionX

The resolution for the X axis.

resolutionY

The resolution for the Y axis.

Remarks

The isotropic scale, for X and Y axis is in metric world units.

EPointCloudToZMapConverter.UnsetMapSize

Unsets the resolution. Lets the conversion decides for the optimum resolution, depending on the projected point cloud and pixel scale.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetMapSize(
 )
```

EPointCloudToZMapConverter.UnsetMapXYResolution

Unsets the X and Y resolutions. Lets the conversion decide the optimal resolution, depending on the projected point cloud and EZMap size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetMapXYResolution(
 )
```

EPointCloudToZMapConverter.UnsetMapZResolution

Unsets the ZMap Z resolution. Lets the conversion decide the optimal Z resolution.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetMapZResolution(
 )
```

EPointCloudToZMapConverter.UnsetOrigin

Lets the conversion process decides for the EZMap origin position (based on projected point cloud on the reference plane).
Use EPointCloudToZMapConverter::Origin to enable and choose the ZMap origin.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetOrigin(
 )
```

EPointCloudToZMapConverter.UnsetWorldToZMapTransform

Disables the explicit world to ZMap transformation, set with EPointCloudToZMapConverter::WorldToZMapTransform.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void UnsetWorldToZMapTransform(
 )
```

EPointCloudToZMapConverter.WorldToZMapTransform

Explicitly sets the world to ZMap transformation.
EPointCloudToZMapConverter::WorldToZMapTransform overrides the settings done by EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::OrientationVector and EPointCloudToZMapConverter::Origin.
That E3DTransformMatrix transform expresses how the world positions are transformed to the EZMap space.
The matrix must be a rigid transformation (translation and rotation only).
The resolutions of the ZMap are defined by the EPointCloudToZMapConverter::SetMapXYResolution and EPointCloudToZMapConverter::MapZResolution methods.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix WorldToZMapTransform
  { get; set; }
```

EPointCloudToZMapConverter.ZMaptoWorldTransform

Explicitly sets the ZMap to World transformation.
"SetZMaptoWorldTransform" overrides the settings done by EPointCloudToZMapConverter::ReferencePlane, EPointCloudToZMapConverter::OrientationVector and EPointCloudToZMapConverter::Origin.
That E3DTransformMatrix transform expresses how the EZMap positions are transformed to the World space.
The matrix must be a rigid transformation (translation and rotation only).
The resolutions of the World are defined by the EPointCloudToZMapConverter::SetMapXYResolution and EPointCloudToZMapConverter::MapZResolution methods.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix ZMaptoWorldTransform
  { get; set; }
```

4.193. EPointGauge Class

Manages a point location gauge.

Base Class:EPointShape
Namespace: Euresys.Open_eVision

Properties

Active	Sets the flag indicating whether the gauge is active or not.
Center	Center coordinates of a EPointGauge object.
HVConstraint	Status of the restriction on the orientation of the point location gauge or model fitting sample paths.
MinAmplitude	Offset added to the Threshold when a peak is to be detected.
MinArea	Minimum area value.
NumMeasuredPoints	Number of edge-crossing points along the point location gauge.
RectangularSamplingArea	Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.
Smoothing	Number of pixels used for the low-pass filtering operation.
Thickness	Number of parallel segments used to extract the data profile.
Threshold	Threshold level used to delimit significant peaks in the data profile.
Tolerance	Half length of the point location gauge.
ToleranceAngle	Rotation angle of the point location gauge.
TransitionChoice	Transition choice.
TransitionIndex	Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.
TransitionType	Transition type.
Type	Shape type.
Valid	Flag indicating if at least one valid transition has been found.

Methods

CopyTo	Copies all the data of the current EPointGauge object into another EPointGauge object, and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
EPointGauge	Constructs a point measurement context.
GetMeasuredPeak	Returns information pertaining to the derivative peak associated with the specified edge-crossing point, such as its area, amplitude, start, length and center.

GetMeasuredPoint	Returns the coordinates of an edge-crossing point, measured along the unique sample path of the point location gauge.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Measure	Triggers the point location or the model fitting operation.
operator=	Copies all the data from another EPointGauge object into the current EPointGauge object
Plot	Draws the profile that is crossed by a point location gauge, as defined by EPlotItem.
PlotWithCurrentPen	Draws the profile that is crossed by a point location gauge, as defined by EPlotItem.
Process	Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.
SetCenterXY	Sets the center coordinates of a EPointGauge object.
SetTolerances	Sets the half length and the rotation angle of the point location gauge.

EPointGauge.Active

Sets the flag indicating whether the gauge is active or not.

Namespace: Euresys.Open_eVision

[C#]

```
override bool Active
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying EPointGauge::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process. By default, the gauge is active (true).

EPointGauge.Center

Center coordinates of a EPointGauge object.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EPoint Center
  { get; set; }
```

EPointGauge.CopyTo

Copies all the data of the current EPointGauge object into another EPointGauge object, and returns it.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.EPointGauge other,
 bool recursive
 )
Euresys.Open_eVision.EPointGauge CopyTo(
 Euresys.Open_eVision.EPointGauge other,
 bool recursive
 )
```

Parameters

other

Pointer to the EPointGauge object in which the current EPointGauge object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EPointGauge object will be created and returned.

EPointGauge.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int x,
 int y
 )
```

Parameters

x

Cursor current X coordinate.

y

Cursor current Y coordinate.

EPointGauge.Draw

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPointGauge.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPointGauge.EPointGauge

Constructs a point measurement context.

Namespace: Euresys.Open_eVision

[C#]

```
void EPointGauge(
 )

void EPointGauge(
 float centerX,
 float centerY
 )

void EPointGauge(
 Euresys.Open_eVision.EPointGauge other
 )
```

Parameters

centerX

Point X coordinate.

centerY

Point Y coordinate.

other

Another EPointGauge object to be copied in the new EPointGauge object.

Remarks

With the default constructor, all the parameters are initialized to their respective default values. With the copy constructor, the constructed point measurement context is based on a pre-existing EPointGauge object. The gauge children are also copied. Hierarchy copying through a copy constructor is always recursive. To disable this recursion, use instead the EPointGauge::CopyTo method.

EPointGauge.GetMeasuredPeak

Returns information pertaining to the derivative peak associated with the specified edge-crossing point, such as its area, amplitude, start, length and center.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPeak GetMeasuredPeak(
 uint index
 )
```

Parameters

index

Index of the edge-crossing point along the probed line segment, between 0 and EPointGauge::NumMeasuredPoints (excluded).

Remarks

If index is left unchanged from its default value (i.e. ~0 = 0xFFFFFFFF), the peak associated to the default edge-crossing point is inspected. This default point is chosen according to the transition choice parameter that is managed by the EPointGauge::TransitionChoice property.

Note. For this method to succeed, it is necessary to previously call EPointGauge::Measure.

EPointGauge.GetMeasuredPoint

Returns the coordinates of an edge-crossing point, measured along the unique sample path of the point location gauge.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetMeasuredPoint(
 uint index
 )
```

Parameters

index

Index of the edge-crossing point along the probed line segment, between 0 and EPointGauge::NumMeasuredPoints (excluded).

Remarks

These coordinates pertain to the World space; they are expressed in the reference frame to which the current EPointGauge object belongs. An EPointGauge object features only one sample path, which contrasts with the other kinds of gauges. The argument index specifies the index of the edge-crossing point that is considered along this unique sample path. If index is left unchanged from its default value (i.e. ~0= 0xFFFFFFFF), the default edge-crossing point is inspected. This default point is chosen according to the transition choice parameter that is managed by the EPointGauge::TransitionChoice property.

Note. For this method to succeed, it is necessary to previously call EPointGauge::Measure.

EPointGauge.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the daughters gauges handles have to be considered as well.

EPointGauge.HVConstraint

Status of the restriction on the orientation of the point location gauge or model fitting sample paths.

Namespace: Euresys.Open_eVision

[C#]

```
bool HVConstraint
  { get; set; }
```

Remarks

Sample paths are the point location gauges placed along the model to be fitted.

EPointGauge.Measure

Triggers the point location or the model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Pointer to the source image.

region

Region to use with the source image.

Remarks

When this method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

EPointGauge.MinAmplitude

Offset added to the Threshold when a peak is to be detected.

Namespace: Euresys.Open_eVision

```
[C#]
uint MinAmplitude
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value. To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected. When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

EPointGauge.MinArea

Minimum area value.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinArea
  { get; set; }
```

Remarks

A transition is detected if its derivative peak reaches Threshold + MinAmplitude value, and then declared valid if the area between the peak curve and the horizontal at level Threshold reaches the MinArea value.

EPointGauge.NumMeasuredPoints

Number of edge-crossing points along the point location gauge.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumMeasuredPoints
  { get; }
```

EPointGauge.operator=

Copies all the data from another EPointGauge object into the current EPointGauge object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPointGauge operator=(
 Euresys.Open_eVision.EPointGauge other
 )
```

Parameters

other

EPointGauge object to be copied

EPointGauge.Plot

Draws the profile that is crossed by a point location gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void Plot(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.

height
Height of the plot.

originX
Origin point coordinates of the plot along the X axis.

originY
Origin point coordinates of the plot along the Y axis.

color
The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPointGauge.PlotWithCurrentPen

This method is deprecated.

Draws the profile that is crossed by a point location gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void PlotWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawItems

Boolean combination of EPlotItem members, that indicates which items must be displayed.

width

Width of the plot.

height

Height of the plot.

originX

Origin point coordinates of the plot along the X axis.

originY

Origin point coordinates of the plot along the Y axis.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPointGauge.Process

Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.

Namespace: Euresys.Open_eVision

[C#]

```
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool daughters
 )
```

```
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 bool daughters
 )
```

Parameters

sourceImage

Pointer to the source image.

daughters

Flag indicating whether the daughters shapes inherit of the same behavior.

region

Region to use with the source image.

Remarks

When complex gauging is required, several gauges can be grouped together. Applying Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

EPointGauge.RectangularSamplingArea

Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.

Namespace: Euresys.Open_eVision

[C#]

```
bool RectangularSamplingArea
  { get; set; }
```

Remarks

By default, this flag is set to true: the sampling area always remains a rectangle. Setting this property is only useful when the thickness transition parameter is greater than 1. In fact, when thickness transition parameter is equal to 1, rectangle and parallelogram reduce to the same segment.

EPointGauge.SetCenterXY

Sets the center coordinates of a EPointGauge object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the EPointGauge object.

centerY

Center coordinates of the EPointGauge object.

EPointGauge.SetTolerances

Sets the half length and the rotation angle of the point location gauge.

Namespace: Euresys.Open_eVision

```
[C#]
void SetTolerances(
 float tolerance,
 float angle
 )
```

Parameters

tolerance

Half length of the point location gauge. The default value is 10.

angle

Rotation angle of the point location gauge. The default value is 0.

Remarks

By default, the point location gauge length value is 20 (2x10), which means 20 pixels when the field of view is not calibrated and 20 "units" in case of a calibrated field of view. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EPointGauge.Smoothing

Number of pixels used for the low-pass filtering operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint Smoothing
   { get; set; }
```

Remarks

To reduce the effect of noise, the profile data can be low-pass filtered along the point location gauge direction.

EPointGauge.Thickness

Number of parallel segments used to extract the data profile.

Namespace: Euresys.Open_eVision

[C#]

```
uint Thickness
  { get; set; }
```

Remarks

To reduce the effect of noise and/or strengthen a transition, several parallel profiles can be accumulated.

EPointGauge.Threshold

Threshold level used to delimit significant peaks in the data profile.

Namespace: Euresys.Open_eVision

[C#]

```
uint Threshold
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value. To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected. When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

EPointGauge.Tolerance

Half length of the point location gauge.

Namespace: Euresys.Open_eVision

[C#]

```
float Tolerance
  { get; set; }
```

Remarks

By default, the length of the point location gauge is 20 (2x10), which means 20 pixels when the field of view is not calibrated, and 20 physical units in case of a calibrated field of view.

EPointGauge.ToleranceAngle

Rotation angle of the point location gauge.

Namespace: Euresys.Open_eVision

```
[C#]
float ToleranceAngle
  { get; set; }
```

Remarks

By default, the rotation angle of the point location gauge is 0. The sign of the rotation angle depends whether the field of view is calibrated or not. * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value. * When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EPointGauge.TransitionChoice

Transition choice.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionChoice TransitionChoice
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition. In case of NthFromBegin or NthFromEnd transition choice, set EPointGauge::TransitionIndex to specify the desired transition. By default, the selected transition corresponds to the one with the largest amplitude (LargestAmplitude).

EPointGauge.TransitionIndex

Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.

Namespace: Euresys.Open_eVision

```
[C#]
uint TransitionIndex
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition. By default, the first transition is retained (the index value is 0).

EPointGauge.TransitionType

Transition type.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionType TransitionType
  { get; set; }
```

Remarks

The type of a transition tells whether it crosses increasing or decreasing gray-level values. This helps discriminate between nearby edges of an object. By default, the searched transition type is indifferently a black to white or a white to black transition (BwOrWb).

EPointGauge.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

EPointGauge.Valid

Flag indicating if at least one valid transition has been found.

Namespace: Euresys.Open_eVision

```
[C#]
bool Valid
  { get; }
```

Remarks

A false value means that no measurement has been performed. A true value means that a transition was found along the sample path defined by the EPointGauge, and thus a point was measured.

4.194. EPointShape Class

Manages a point shape context.

Base Class:EShape
Derived Class(es):EPointGauge
Namespace: Euresys.Open_eVision

Properties

Center	Center coordinates of a EPointShape object.
CenterX	Abscissa of the origin point of the frame.
CenterY	Ordinate of the origin point of the frame.
Type	Shape type.

Methods

Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
CopyTo	Copies all the data of the current EPointShape object into another EPointShape object, and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
HitTest	Checks if there is a handle under the cursor.
operator!=	Compares the instance another EPointShape object and returns true if they are not identical.
operator=	Copies all the data from another EPointShape object into the current EPointShape object
operator==	Compares the instance another EPointShape object and returns true if they are identical.
SetCenterXY	Sets the center coordinates of a EPointShape object.

EPointShape.Center

Center coordinates of a EPointShape object.

Namespace: Euresys.Open_eVision

[C#]

```
virtual Euresys.Open_eVision.EPoint Center
  { get; set; }
```

EPointShape.CenterX

Abscissa of the origin point of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

EPointShape.CenterY

Ordinate of the origin point of the frame.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

EPointShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

[C#]

```
void Closest(
 )
```

EPointShape.CopyTo

Copies all the data of the current EPointShape object into another EPointShape object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EPointShape other,
 bool recursive
 )

Euresys.Open_eVision.EPointShape CopyTo(
 Euresys.Open_eVision.EPointShape other,
 bool recursive
 )
```

Parameters

other

Pointer to the EPointShape object in which the current EPointShape object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EPointShape object will be created and returned.

EPointShape.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

-

n32CursorY

-

EPointShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPointShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPointShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

EPointShape.operator!=

Compares the instance another EPointShape object and returns true if they are not identical.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EPointShape other
 )
```

Parameters

other

EPointShape object to be compared

EPointShape.operator=

Copies all the data from another EPointShape object into the current EPointShape object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPointShape operator=(
 Euresys.Open_eVision.EPointShape other
 )
```

Parameters

other

EPointShape object to be copied

EPointShape.operator==

Compares the instance another EPointShape object and returns true if they are identical.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EPointShape other
 )
```

Parameters

other

EPointShape object to be compared

EPointShape.SetCenterXY

Sets the center coordinates of a EPointShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the EPointShape object.

centerY

Center coordinates of the EPointShape object.

EPointShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

4.195. EPolygon Class

Represents a polygon. The number of vertices is arbitrary. A EPolygon could be closed (last and first point connected) or open (like a polyline shape).

Base Class:EFrame

Namespace: Euresys.Open_eVision

Properties

Area	Returns the area of the polygon.
IsClosed	The polygon close attribute.
Length	Returns the length (perimeter) of the polygon.
NumEdges	Returns the number of polygon's edges (or sides). Depends on the EPolygon::IsClosed status.
NumVertices	Returns the number of polygon's vertices.
Vertices	Returns the list of polygon vertices

Methods

AppendVertex	Appends a polygon vertex after the last.
CopyTo	Copies all the data of the current EPolygon object into another EPolygon object, and returns it.
EPolygon	Constructs a EPolygon
GetVertex	Gets a polygon vertex.
InsertVertex	Inserts a vertex before the given index.
IsValid	Returns true if the polygon is valid. A valid polygon has at least 2 (when open) or 3 (when closed) distinct and valid vertices and no duplicate points.
Load	Loads the polygon.
operator!=	Compares the current EPolygon with another EPolygon object.

operator=	Copies all the data from another EPolygon object into the current EPolygon object
operator==	Compares the current EPolygon with another EPolygon object.
RemoveVertex	Removes vertex at the given index.
Save	Saves the polygon.
SetVertex	Sets a polygon vertex.

EPolygon.AppendVertex

Appends a polygon vertex after the last.

Namespace: Euresys.Open_eVision

[C#]

```
void AppendVertex(
 Euresys.Open_eVision.EPoint pt
 )
```

Parameters

pt

The point to append.

EPolygon.Area

Returns the area of the polygon.

Namespace: Euresys.Open_eVision

[C#]

```
float Area
  { get; }
```

EPolygon.CopyTo

Copies all the data of the current EPolygon object into another EPolygon object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EPolygon other
 )
```

```
Euresys.Open_eVision.EPolygon CopyTo(
 Euresys.Open_eVision.EPolygon other
 )
```

Parameters

other

Pointer to the EPolygon object in which the current EPolygon object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EPolygon object will be created and returned.

EPolygon.EPolygon

Constructs a EPolygon

Namespace: Euresys.Open_eVision

[C#]

```
void EPolygon(
 )

void EPolygon(
 Euresys.Open_eVision.EPolygon other
 )

void EPolygon(
 Euresys.Open_eVision.EPoint[] vertices,
 bool closed
 )
```

Parameters

other

Reference to the EPolygon used for the initialization.

vertices

A vector of at least 3 points.

closed

An optional parameter to set the closed properties. When closed, an edge exists between the last and first points of the polygon. By default, created polygons are closed.

EPolygon.GetVertex

Gets a polygon vertex.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetVertex(
 int index
 )
```

Parameters

index

The index of the vertex.

EPolygon.InsertVertex

Inserts a vertex before the given index.

Namespace: Euresys.Open_eVision

```
[C#]
void InsertVertex(
 int index,
 Euresys.Open_eVision.EPoint pt
 )
```

Parameters

index

The index after which the vertex will be inserted.

pt

The point to insert.

EPolygon.IsClosed

The polygon close attribute.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsClosed
  { get; set; }
```

EPolygon.IsValid

Returns true if the polygon is valid. A valid polygon has at least 2 (when open) or 3 (when closed) distinct and valid vertices and no duplicate points.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsValid(
 )
```

EPolygon.Length

Returns the length (perimeter) of the polygon.

Namespace: Euresys.Open_eVision

[C#]

```
float Length
  { get; }
```

EPolygon.Load

Loads the polygon.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string file
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

file
File path.

serializer
Serializer. Must be in read mode.

EPolygon.NumEdges

Returns the number of polygon's edges (or sides). Depends on the EPolygon::IsClosed status.

Namespace: Euresys.Open_eVision

[C#]

```
int NumEdges
  { get; }
```

EPolygon.NumVertices

Returns the number of polygon's vertices.

Namespace: Euresys.Open_eVision

[C#]

```
int NumVertices
  { get; }
```

EPolygon.operator!=

Compares the current EPolygon with another EPolygon object.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EPolygon polygon
 )
```

Parameters

polygon

The other EPolygon object.

EPolygon.operator=

Copies all the data from another EPolygon object into the current EPolygon object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPolygon operator=(
 Euresys.Open_eVision.EPolygon other
 )
```

Parameters

other

EPolygon object to be copied

EPolygon.operator==

Compares the current EPolygon with another EPolygon object.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EPolygon polygon
 )
```

Parameters

polygon
The other EPolygon object.

EPolygon.RemoveVertex

Removes vertex at the given index.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveVertex(
 int index
 )
```

Parameters

index
The index of the vertex to remove.

EPolygon.Save

Saves the polygon.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string file
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

file
File path.

serializer
Serializer. Must be in write mode.

EPolygon.SetVertex

Sets a polygon vertex.

Namespace: Euresys.Open_eVision

```
[C#]
void SetVertex(
 int index,
 Euresys.Open_eVision.EPoint pt
 )
```

Parameters

index

The index of the vertex.

pt

The vertex position.

EPolygon.Vertices

Returns the list of polygon vertices

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint[] Vertices
  { get; }
```

4.196. EPolygonGauge Class

Manages a polygon fitting gauge.

Base Class:EPolygonShape

Namespace: Euresys.Open_eVision

Properties

Active	Sets the flag indicating whether the gauge is active or not.
AverageDistance	Average distance between the sampled points and the fitted model.
EnableScaling	When using the Global mode, if EPolygonGauge::EnableScaling is enable then the best scale is evaluated.
FilteringThreshold	Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

HVConstraint	Status of the restriction on the orientation of the point location gauge or model fitting sample paths.
MeasuredPolygon	Returns the measured polygon (if found) or the nominal polygon otherwise.
MeasurementMode	The polygon gauge measurement mode, in EPolygonMeasurementMode. The default mode is Global.
MinAmplitude	Offset added to the Threshold when a peak is to be detected.
MinArea	Minimum area value.
MinNumFitSamples	Sets the minimum number of samples required for fitting on each edges of the polygon.
NumFilteringPasses	Number of filtering passes for a model fitting operation.
NumSamples	Number of sampled points during the model fitting operation. The samples are distributed evenly on the polygon.
NumSkipRanges	Number of skip ranges in the gauge after a call to EPolygonGauge::AddSkipRange.
NumValidSamples	Number of valid sample points remaining after a model fitting operation.
SamplingStep	Approximate distance between sampled points during a model fitting operation.
Smoothing	Number of pixels used for the low-pass filtering operation.
Thickness	Number of parallel segments used to extract the data profile.
Threshold	Threshold level used to delimit significant peaks in the data profile.
Tolerance	Searching area half thickness of the polygon fitting gauge.
TransitionChoice	Transition choice.
TransitionIndex	Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.
TransitionType	Transition type.
Type	Shape type.

Methods

AddSkipRange	Adds an item to the set of skip ranges and returns the index of the newly added range.
CopyTo	Copies all the data of the current EPolygonGauge object into another EPolygonGauge object, and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

EPolygonGauge	Constructs a polygon measurement context.
GetSkipRange	Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the EPolygonGauge::AddSkipRange method.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Measure	Triggers the point location or the model fitting operation.
MeasureSample	Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.
operator=	Copies all the data from another EPolygonGauge object into the current EPolygonGauge object
Process	Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.
RemoveAllSkipRanges	Removes all the skip ranges previously created by a call to EPolygonGauge::AddSkipRange.
RemoveSkipRange	After a call to EPolygonGauge::AddSkipRange, removes the skip range with the given index.

EPolygonGauge.Active

Sets the flag indicating whether the gauge is active or not.

Namespace: Euresys.Open_eVision

```
[C#]
override bool Active
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying EPolygonGauge::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process. By default, the gauge is active (true).

EPolygonGauge.AddSkipRange

Adds an item to the set of skip ranges and returns the index of the newly added range.

Namespace: Euresys.Open_eVision

```
[C#]
uint AddSkipRange(
 uint start,
 uint end
 )
```

Parameters

start

Beginning of the skip range.

end

End of the skip range.

Remarks

The samples indices between start and end (including the boundaries) will be discarded during the measurement process.
The EPolygonGauge::AddSkipRange method allows to define skip ranges in an EPolygonGauge. This means that, at measure time, samples belonging to these ranges will not be taken into account.
A sample may belong to more than one skip range; to be discarded, a sample has to pertain to at least one range. Moreover, the skip ranges are allowed to overlap one another.
The range is allowed to be reversed (i.e. end is not required to be greater than start).
Also, start and end are not required to reference valid indices at the time of the call (i.e. the range may lie outside of the current return value for EPolygonGauge::NumSamples).

EPolygonGauge.AverageDistance

Average distance between the sampled points and the fitted model.

Namespace: Euresys.Open_eVision

[C#]

```
float AverageDistance
  { get; }
```

Remarks

Irrelevant in case of a point location operation.

EPolygonGauge.CopyTo

Copies all the data of the current EPolygonGauge object into another EPolygonGauge object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EPolygonGauge other,
 bool recursive
 )

Euresys.Open_eVision.EPolygonGauge CopyTo(
 Euresys.Open_eVision.EPolygonGauge other,
 bool recursive
 )
```

Parameters

other

Pointer to the EPolygonGauge object in which the current EPolygonGauge object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EPolygonGauge object will be created and returned.

EPolygonGauge.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int x,
 int y
 )
```

Parameters

x

Cursor current X coordinate.

y

Cursor current Y coordinate.

EPolygonGauge.Draw

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

```
void Draw(
 IntPtr hdc,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr hdc,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

hdc

-

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPolygonGauge.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr hdc,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

hdc

-

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPolygonGauge.EnableScaling

When using the Global mode, if EPolygonGauge::EnableScaling is enable then the best scale is evaluated.

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableScaling
  { get; set; }
```

EPolygonGauge.EPolygonGauge

Constructs a polygon measurement context.

Namespace: Euresys.Open_eVision

[C#]

```
void EPolygonGauge(
 )
void EPolygonGauge(
 Euresys.Open_eVision.EPolygonGauge other
 )
```

Parameters

other

Another EPolygonGauge object to be copied in the new EPolygonGauge object.

Remarks

With the default constructor, all the parameters are initialized to their respective default values.
With the copy constructor, the constructed polygon measurement context is based on a pre-existing EPolygonGauge object. The gauge children are also copied. Hierarchy copying through a copy constructor is always recursive. To disable this recursion, use instead the EPolygonGauge::CopyTo method.

EPolygonGauge.FilteringThreshold

Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

Namespace: Euresys.Open_eVision

```
[C#]
float FilteringThreshold
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).

EPolygonGauge.GetSkipRange

Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the EPolygonGauge::AddSkipRange method.

Namespace: Euresys.Open_eVision

```
[C#]
void GetSkipRange(
 uint index,
 ref uint start,
 ref uint end
 )
```

Parameters

index
Index of the skip range.

start
Beginning of the skip range.

end
End of the skip range.

Remarks

Start is guaranteed to be smaller or equal to end.

EPolygonGauge.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the daughters gauges handles have to be considered as well.

EPolygonGauge.HVConstraint

Status of the restriction on the orientation of the point location gauge or model fitting sample paths.

Namespace: Euresys.Open_eVision

[C#]

```
bool HVConstraint
  { get; set; }
```

Remarks

Sample paths are the point location gauges placed along the model to be fitted.

EPolygonGauge.Measure

Triggers the point location or the model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )

void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Pointer to the source image.

region

Region to use with the source image.

Remarks

When this method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

EPolygonGauge.MeasuredPolygon

Returns the measured polygon (if found) or the nominal polygon otherwise.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygon MeasuredPolygon
  { get; }
```

Remarks

Use method EShape::GetFound to get the status of the measurement. EPolygonGauge::MeasuredPolygon returns a successful fitted polygon if EShape::GetFound is true, otherwise it returns the orginal (nominal) polygon.

EPolygonGauge.MeasurementMode

The polygon gauge measurement mode, in EPolygonMeasurementMode. The default mode is Global.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonMeasurementMode MeasurementMode
  { get; set; }
```

EPolygonGauge.MeasureSample

Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 image,
 int edgeIndex,
 int sampleIndex
 )
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.ERegion region,
 int edgeIndex,
 int sampleIndex
 )
```

Parameters

image

-

edgeIndex

-

sampleIndex

-

region

Region on which to measure.

Remarks

This method stores its results into a temporary variable inside the EPolygonGauge object.

EPolygonGauge.MinAmplitude

Offset added to the Threshold when a peak is to be detected.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinAmplitude
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value.
To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected.
When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

EPolygonGauge.MinArea

Minimum area value.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinArea
  { get; set; }
```

Remarks

A transition is detected if its derivative peak reaches Threshold + MinAmplitude value, and then declared valid if the area between the peak curve and the horizontal at level Threshold reaches the MinArea value.

EPolygonGauge.MinNumFitSamples

Sets the minimum number of samples required for fitting on each edges of the polygon.

Namespace: Euresys.Open_eVision

[C#]

```
int MinNumFitSamples
  { get; set; }
```

Remarks

When the EPolygonGauge::Measure method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

EPolygonGauge.NumFilteringPasses

Number of filtering passes for a model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumFilteringPasses
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
During a filtering pass, the points that are too distant from the model are discarded.
During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).
By default (the number of filtering passes is 0), the outliers rejection process is disabled.

EPolygonGauge.NumSamples

Number of sampled points during the model fitting operation. The samples are distributed evenly on the polygon.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamples
  { get; }
```

Remarks

After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

EPolygonGauge.NumSkipRanges

Number of skip ranges in the gauge after a call to EPolygonGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSkipRanges
  { get; }
```

EPolygonGauge.NumValidSamples

Number of valid sample points remaining after a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumValidSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation.
After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

EPolygonGauge.operator=

Copies all the data from another EPolygonGauge object into the current EPolygonGauge object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonGauge operator=(
 Euresys.Open_eVision.EPolygonGauge other
 )
```

Parameters

other

EPolygonGauge object to be copied

EPolygonGauge.Process

Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.

Namespace: Euresys.Open_eVision

```
[C#]
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool daughters
 )
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 bool daughters
 )
```

Parameters

sourceImage

Pointer to the source image.

daughters

Flag indicating whether the daughters shapes inherit of the same behavior.

region

Region to use with the source image.

Remarks

When complex gauging is required, several gauges can be grouped together. Applying Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

EPolygonGauge.RemoveAllSkipRanges

Removes all the skip ranges previously created by a call to EPolygonGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveAllSkipRanges(
 )
```

EPolygonGauge.RemoveSkipRange

After a call to EPolygonGauge::AddSkipRange, removes the skip range with the given index.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveSkipRange(
 uint index
 )
```

Parameters

index

Index of the skip range to remove, as returned by EPolygonGauge::AddSkipRange.

EPolygonGauge.SamplingStep

Approximate distance between sampled points during a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
float SamplingStep
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
To fit a model, a series of point location operations are performed along the model. The point location gauges spacing is given by the sampling step.
By default, the sampling step is set to 5, which means 5 pixels when the field of view is not calibrated, and 5 physical units in case of a calibrated field of view.
Be aware that if the sampling step is too large, the number of sampled points along the model will not be sufficient enough to accurately locate it.

EPolygonGauge.Smoothing

Number of pixels used for the low-pass filtering operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint Smoothing
  { get; set; }
```

Remarks

To reduce the effect of noise, the profile data can be low-pass filtered along the point location gauge direction.

EPolygonGauge.Thickness

Number of parallel segments used to extract the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Thickness
  { get; set; }
```

Remarks

To reduce the effect of noise and/or strengthen a transition, several parallel profiles can be accumulated.

EPolygonGauge.Threshold

Threshold level used to delimit significant peaks in the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Threshold
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value.
To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected.
When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

EPolygonGauge.Tolerance

Searching area half thickness of the polygon fitting gauge.

Namespace: Euresys.Open_eVision

[C#]

```
float Tolerance
  { get; set; }
```

Remarks

A polygon fitting gauge is fully defined knowing its nominal positions (vertices), its nominal origin, angle and scale, and its outline tolerance.
By default, the searching area thickness of the polygon fitting gauge is 20 (2x10), which means 20 pixels when the field of view is not calibrated, and 20 physical units in case of a calibrated field of view.

EPolygonGauge.TransitionChoice

Transition choice.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ETransitionChoice TransitionChoice
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition.
In case of NthFromBegin or NthFromEnd transition choice, set EPolygonGauge::TransitionIndex to specify the desired transition.
By default, the selected transition corresponds to the one with the largest amplitude (LargestAmplitude).

EPolygonGauge.TransitionIndex

Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.

Namespace: Euresys.Open_eVision

[C#]

```
uint TransitionIndex
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition.
By default, the first transition is retained (the index value is 0).

EPolygonGauge.TransitionType

Transition type.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionType TransitionType
  { get; set; }
```

Remarks

The type of a transition tells whether it crosses increasing or decreasing gray-level values. This helps discriminate between nearby edges of an object.
By default, the searched transition type is indifferently a black to white or a white to black transition (BwOrWb).

EPolygonGauge.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

4.197. EPolygonRegion Class

Manages a complete context for an ERegion shaped like a polygon.

Base Class:ERegion
Namespace: Euresys.Open_eVision

Properties

NumPoints	Number of vertices of the region.
Points	List of vertices of the region

Methods

AddPoint	Add a new vertex at the end of the region
Drag	Moves the specified handle to a new position and updates all placement parameters of the region.
EPolygonRegion	Constructs an EPolygonRegion context.
HitTest	Detects if the cursor is placed over one of the dragging handles.
InsertPoint	Insert a vertice between two existing ones
Load	Loads the EPolygonRegion. The given ESerializer must have been created for reading.
operator!=	Checks if this EPolygonRegion instance is not strictly equal to another
operator=	Assignment operator.
operator==	Checks if this EPolygonRegion instance is strictly equal to another
RemovePoint	Remove a vertex
Rotate	Creates a new EPolygonRegion by rotating the EPolygonRegion.
Save	Saves the EPolygonRegion. The given ESerializer must have been created for writing.
Scale	Creates a new EPolygonRegion by scaling the region.
Translate	Creates a new EPolygonRegion by translating the EPolygonRegion.

EPolygonRegion.AddPoint

Add a new vertex at the end of the region

Namespace: Euresys.Open_eVision

```
[C#]
void AddPoint(
 Euresys.Open_eVision.EPoint point
 )
```

Parameters

point

-

EPolygonRegion.Drag

Moves the specified handle to a new position and updates all placement parameters of the region.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with EPolygonRegion::HitTest and EPolygonRegion::Drag.

EPolygonRegion.EPolygonRegion

Constructs an EPolygonRegion context.

Namespace: Euresys.Open_eVision

[C#]

```
void EPolygonRegion(
 )

void EPolygonRegion(
 Euresys.Open_eVision.EPoint[] points
 )

void EPolygonRegion(
 Euresys.Open_eVision.EPolygonRegion other
 )
```

Parameters

points

The list of vertices of the EPolygonRegion.

other

EPolygonRegion context to copy.

EPolygonRegion.HitTest

Detects if the cursor is placed over one of the dragging handles.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EEditionMode HitTest(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

Returns a handle identifier, as defined by EEditionMode.
If zooming and/or panning were used when drawing the region, the same values must be used with EPolygonRegion::HitTest and EPolygonRegion::Drag.

EPolygonRegion.InsertPoint

Insert a vertice between two existing ones

Namespace: Euresys.Open_eVision

```
[C#]
bool InsertPoint(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with EPolygonRegion::HitTest and EPolygonRegion::Drag.

EPolygonRegion.Load

Loads the EPolygonRegion. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPolygonRegion.NumPoints

Number of vertices of the region.

Namespace: Euresys.Open_eVision

```
[C#]
int NumPoints
  { get; }
```

EPolygonRegion.operator!=

Checks if this EPolygonRegion instance is not strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EPolygonRegion other
 )
```

Parameters

other

Reference to the other EPolygonRegion instance

EPolygonRegion.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonRegion operator=(
 Euresys.Open_eVision.EPolygonRegion other
 )
```

Parameters

other

Reference to the EPolygonRegion used for the assignment

EPolygonRegion.operator==

Checks if this EPolygonRegion instance is strictly equal to another

Namespace: Euresys.Open_eVision

[C#]

```
bool operator==(
 Euresys.Open_eVision.EPolygonRegion other
 )
```

Parameters

other

Reference to the other EPolygonRegion instance

EPolygonRegion.Points

List of vertices of the region

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint[] Points
  { get; set; }
```

EPolygonRegion.RemovePoint

Remove a vertex

Namespace: Euresys.Open_eVision

[C#]

```
bool RemovePoint(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x
x-coordinate of the mouse cursor.

y
y-coordinate of the mouse cursor.

zoomX
Horizontal zoom factor. By default, true scale is used.

zoomY
Vertical zoom factor. By default, true scale is used.

panX
Horizontal pan offset. By default, no pan is added.

panY
Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with EPolygonRegion::HitTest and EPolygonRegion::Drag.

EPolygonRegion.Rotate

Creates a new EPolygonRegion by rotating the EPolygonRegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonRegion Rotate(
 float angle
 )
```

Parameters

angle
rotation angle

EPolygonRegion.Save

Saves the EPolygonRegion. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

EPolygonRegion.Scale

Creates a new EPolygonRegion by scaling the region.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonRegion Scale(
 float scale
 )
Euresys.Open_eVision.EPolygonRegion Scale(
 float scaleX,
 float scaleY
 )
```

Parameters

scale
Isotropic scale

scaleX
Horizontal scale

scaleY
Vertical scale

EPolygonRegion.Translate

Creates a new EPolygonRegion by translating the EPolygonRegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonRegion Translate(
 float dx,
 float dy
 )
```

Parameters

dx
Horizontal translation in pixel value

dy
Vertical translation in pixel value

4.198. EPolygonShape Class

Manages a polygonal shape.

Base Class:EShape
Derived Class(es):EPolygonGauge
Namespace: Euresys.Open_eVision

Properties

Angle	Orientation of the shape.
Center	Center point of the shape.
CenterX	Abscissa of the origin point of the shape.
CenterY	Ordinate of the origin point of the shape.
Format	-
IsClosed	The polygon close attribute.
Length	Returns the length (perimeter) of the polygon
NumEdges	Returns the number of polygon's edges (or sides). Depends on the EPolygon::IsClosed status.
NumVertices	Returns the number of polygon's vertices.
Polygon	Sets/Gets the polygon according to a known EPolygon object.
Scale	Scale of the polygon.
Type	Shape type.

Methods

AddVertexAtDisplayPosition	Add a vertex to the polygon at a position depending on a display coordinate. The current display parameters (zoom and pan) are used to find the best insert position.
AppendVertex	Append a polygon vertex after the last.
Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
CopyTo	Copies all the data of the current EPolygonShape object into another EPolygonShape object and returns it.
DisplayToLocalPosition	-
Drag	Moves a handle to a new position and updates the position parameters of the shape.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.

DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
EPolygonShape	Constructs a EPolygonShape
GetVertex	A polygon vertex.
HitTest	Checks if there is a handle under the cursor.
LocalToDisplayPosition	-
operator=	Copies all the data from another EPolygonShape object into the current EPolygonShape object
RemoveVertexAtDisplayPosition	Remove the closest vertex to the display position (x,y)
SerializeData	-
SetCenterXY	Sets the center coordinates of a EPolygonShape object.
SetVertex	-

EPolygonShape.AddVertexAtDisplayPosition

Add a vertex to the polygon at a position depending on a display coordinate. The current display parameters (zoom and pan) are used to find the best insert position.

Namespace: Euresys.Open_eVision

[C#]

```
void AddVertexAtDisplayPosition(
 int x,
 int y
 )
```

Parameters

x

The X coordinate in display space

y

The Y coordinate in display space

EPolygonShape.Angle

Orientation of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

EPolygonShape.AppendVertex

Append a polygon vertex after the last.

Namespace: Euresys.Open_eVision

```
[C#]
void AppendVertex(
 Euresys.Open_eVision.EPoint pt
 )
```

Parameters

pt

The point to append.

EPolygonShape.Center

Center point of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

EPolygonShape.CenterX

Abscissa of the origin point of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterX
  { get; }
```

EPolygonShape.CenterY

Ordinate of the origin point of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterY
  { get; }
```

EPolygonShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

```
[C#]
void Closest(
 )
```

EPolygonShape.CopyTo

Copies all the data of the current EPolygonShape object into another EPolygonShape object and returns it.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.EPolygonShape other,
 bool bRecursive
 )
Euresys.Open_eVision.EPolygonShape CopyTo(
 Euresys.Open_eVision.EPolygonShape dest,
 bool bRecursive
 )
```

Parameters

other

-

bRecursive

true if the children shapes have to be copied as well, false otherwise.

dest

Pointer to the EPolygonShape object in which the current EPolygonShape object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EPolygonShape object will be created and returned.

EPolygonShape.DisplayToLocalPosition

-

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint DisplayToLocalPosition(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EPolygonShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

EPolygonShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPolygonShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EPolygonShape.EPolygonShape

Constructs a EPolygonShape

Namespace: Euresys.Open_eVision

[C#]

```
void EPolygonShape(
 )

void EPolygonShape(
 Euresys.Open_eVision.EPolygonShape other
 )

void EPolygonShape(
 Euresys.Open_eVision.EPoint[] vertices,
 bool closed
 )
```

Parameters

other

Reference to the EPolygonShape used for the initialization.

vertices

A vector of at least 3 points.

closed

An optional parameter to set the closed properties. When closed, an edge exists between the last and first points of the polygon. By default, created polygons are closed.

EPolygonShape.Format

-

Namespace: Euresys.Open_eVision

[C#]

```
string Format
  { get; }
```

EPolygonShape.GetVertex

A polygon vertex.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetVertex(
 int index
 )
```

Parameters

index

The index of the vertex.

EPolygonShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

EPolygonShape.IsClosed

The polygon close attribute.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsClosed
  { get; set; }
```

EPolygonShape.Length

Returns the length (perimeter) of the polygon

Namespace: Euresys.Open_eVision

[C#]

```
float Length
  { get; }
```

EPolygonShape.LocalToDisplayPosition

-

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint LocalToDisplayPosition(
 Euresys.Open_eVision.EPoint p
 )
```

Parameters

p

-

EPolygonShape.NumEdges

Returns the number of polygon's edges (or sides). Depends on the EPolygon::IsClosed status.

Namespace: Euresys.Open_eVision

[C#]

```
int NumEdges
  { get; }
```

EPolygonShape.NumVertices

Returns the number of polygon's vertices.

Namespace: Euresys.Open_eVision

[C#]

```
int NumVertices
  { get; }
```

EPolygonShape.operator=

Copies all the data from another EPolygonShape object into the current EPolygonShape object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygonShape operator=(
 Euresys.Open_eVision.EPolygonShape other
 )
```

Parameters

other

EPolygonShape object to be copied

EPolygonShape.Polygon

Sets/Gets the polygon according to a known EPolygon object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPolygon Polygon
  { get; set; }
```

EPolygonShape.RemoveVertexAtDisplayPosition

Remove the closest vertex to the display position (x,y)

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveVertexAtDisplayPosition(
 int x,
 int y
 )
```

Parameters

x

The X coordinate in display space

y

The Y coordinate in display space

EPolygonShape.Scale

Scale of the polygon.

Namespace: Euresys.Open_eVision

[C#]

```
float Scale
  { get; set; }
```

EPolygonShape.SerializeData

-

Namespace: Euresys.Open_eVision

[C#]

```
void SerializeData(
 Euresys.Open_eVision.ESerializer serializer,
 uint un32FileVersion,
 bool bDaughters
 )
void SerializeData(
 Euresys.Open_eVision.ESerializer serializer,
 uint un32FileVersion
 )
```

Parameters

serializer

-

un32FileVersion

-

bDaughters

-

EPolygonShape.SetCenterXY

Sets the center coordinates of a EPolygonShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the EPolygonShape object.

centerY

Center coordinates of the EPolygonShape object.

EPolygonShape.SetVertex

-

Namespace: Euresys.Open_eVision

```
[C#]
void SetVertex(
 int index,
 Euresys.Open_eVision.EPoint pt
 )
```

Parameters

index

-

pt

-

EPolygonShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

4.199. EPrincipalAxisExtractor Class

A EPrincipalAxisExtractor object computes the principal axis analysis (PCA) on an EPointCloud and produces a E3DTransformMatrix as a result.

Namespace: Euresys.Open_eVision.Easy3D

Properties

ReferenceTransform	Sets/Gets the reference transform (E3DTransformMatrix). If not set, it will use the main basis as reference to select the direction of each axis of the new basis.

Methods

EPrincipalAxisExtractor	Creates an EPrincipalAxisExtractor object.
Extract	Computes the E3DTransformMatrix for a given EPointCloud. This will compute the PCA, then select the direction of each axis of the basis so that this basis is as close as possible as the reference transform. Optionally returns the standard deviation along the 3 axis.
HasReferenceTransformSet	Returns 'true' if a reference transform (E3DTransformMatrix) has been set explicitly.
Load	Loads the EPrincipalAxisExtractor object configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator.
Save	Saves the EPrincipalAxisExtractor object configuration. The given ESerializer must have been created for writing.
UnsetReferenceTransform	Unset the reference transform (E3DTransformMatrix).

EPrincipalAxisExtractor.EPrincipalAxisExtractor

Creates an EPrincipalAxisExtractor object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EPrincipalAxisExtractor(
 )
void EPrincipalAxisExtractor(
 Euresys.Open_eVision.Easy3D.EPrincipalAxisExtractor other
 )
```

Parameters

other

The object used for the initialization

EPrincipalAxisExtractor.Extract

Computes the E3DTransformMatrix for a given EPointCloud.
This will compute the PCA, then select the direction of each axis of the basis so that this basis is as close as possible as the reference transform.
Optionally returns the standard deviation along the 3 axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix Extract(
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )

Euresys.Open_eVision.Easy3D.E3DTransformMatrix Extract(
 Euresys.Open_eVision.Easy3D.EPointCloud pc,
 out float stdDevX,
 out float stdDevY,
 out float stdDevZ
 )
```

Parameters

pc
Input point cloud.

stdDevX
Variable to store the X component of the standard deviation.

stdDevY
Variable to store the Y component of the standard deviation.

stdDevZ
Variable to store the Z component of the standard deviation.

EPrincipalAxisExtractor.HasReferenceTransformSet

Returns 'true' if a reference transform (E3DTransformMatrix) has been set explicitly.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool HasReferenceTransformSet(
 )
```

EPrincipalAxisExtractor.Load

Loads the EPrincipalAxisExtractor object configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EPrincipalAxisExtractor.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EPrincipalAxisExtractor operator=(
 Euresys.Open_eVision.Easy3D.EPrincipalAxisExtractor other
 )
```

Parameters

other

The EPrincipalAxisExtractor object that should be copied.

EPrincipalAxisExtractor.ReferenceTransform

Sets/Gets the reference transform (E3DTransformMatrix). If not set, it will use the main basis as reference to select the direction of each axis of the new basis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DTransformMatrix ReferenceTransform
  { get; set; }
```

EPrincipalAxisExtractor.Save

Saves the EPrincipalAxisExtractor object configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EPrincipalAxisExtractor.UnsetReferenceTransform

Unset the reference transform (E3DTransformMatrix).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void UnsetReferenceTransform(
 )
```

4.200. EPseudoColorLookup Class

Describes a lookup table, that is used to for pseudo-coloring (i.e. for assigning colors to gray-level images).

Namespace: Euresys.Open_eVision

Methods

EPseudoColorLookup	Default constructor of EPseudoColorLookup objects.
SetShading	Sets up a pseudo-color mapping such that gray level 0 corresponds to color c24Black, gray level 255 corresponds to color c24White, and intermediate values are interpolated linearly between these two extremes.

EPseudoColorLookup.EPseudoColorLookup

Default constructor of EPseudoColorLookup objects.

Namespace: Euresys.Open_eVision

```
[C#]
void EPseudoColorLookup(
 )
```

EPseudoColorLookup.SetShading

Sets up a pseudo-color mapping such that gray level 0 corresponds to color c24Black, gray level 255 corresponds to color c24White, and intermediate values are interpolated linearly between these two extremes.

Namespace: Euresys.Open_eVision

```
[C#]
void SetShading(
 Euresys.Open_eVision.EC24 black,
 Euresys.Open_eVision.EC24 white,
 Euresys.Open_eVision.EColorSystem colorSystem,
 bool wrap
 )
```

Parameters

black

Color to be mapped on a black (value 0) pixel.

white

Color to be mapped on a white (value 255) pixel.

colorSystem

Color system in which interpolation takes place.

wrap

If the color system supports a hue component, indicates whether hue wrap around must be applied.

Remarks

Furthermore, interpolation is performed in the designated color system. Even though interpolation is performed in an arbitrary color system, the extreme colors are specified in the RGB space. To obtain interesting shades of colors, it is recommended to interpolate on the hue component alone.

4.201. EQRCode Class

Represents a QR code found in the search field.

Namespace: Euresys.Open_eVision

Properties

DecodedStream	Decoded stream extracted from the QR Code, returned as an EQRCodeDecodedStream object.
Errors	Retrieves the position of the errors detected in the QR code symbol.
Geometry	Geometry of the QR code retruned as an EQRCodeGeometry object.
IsDecodingReliable	Decoding reliabililty.
Iso15415GradingParameters	ISO/IEC 15415 grading parameters
Iso29158GradingParameters	ISO/IEC 29158 grading parameters
Level	Error correction level of the QR code.
Model	Model of the QR code.
UnusedErrorCorrection	Unused error correction.
Version	Version of the QR code.

Methods

Draw	Draws the QR code using a pre-defined pen.
DrawErrors	Draws the detected errors.
DrawErrorsWithCurrentPen	Draws the detected errors using the pen currently set in the graphical context.
DrawWithCurrentPen	Draws the QR code using the pen currently set in the graphical context.
EQRCode	Creates an EQRCode object.
GetCellPosition	Position of a cell of the QR code in the Image/ROI.
GetDecodedString	String containing the concatenated decoded data of the decoded stream.
IsGS1	Return true if the decoded string uses the GS1 standard.
operator=	Assignment operator.

EQRCode.DecodedStream

Decoded stream extracted from the QR Code, returned as an EQRCodeDecodedStream object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeDecodedStream DecodedStream
  { get; }
```

EQRCode.Draw

Draws the QR code using a pre-defined pen.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

Draw adapter.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

hDC

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQRCode.DrawErrors

Draws the detected errors.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawErrors(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawErrors(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

Draw adapter.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

hDC

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQRCode.DrawErrorsWithCurrentPen

This method is deprecated.

Draws the detected errors using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawErrorsWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQRCode.DrawWithCurrentPen

This method is deprecated.

Draws the QR code using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQRCode.EQRCode

Creates an EQRCode object.

Namespace: Euresys.Open_eVision

```
[C#]
void EQRCode(
 )
void EQRCode(
 Euresys.Open_eVision.EQRCode other
 )
```

Parameters

other

Another EQRCode.

EQRCode.Errors

Retrieves the position of the errors detected in the QR code symbol.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixPosition[] Errors
  { get; }
```

EQRCode.Geometry

Geometry of the QR code retruned as an EQRCodeGeometry object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeGeometry Geometry
  { get; }
```

Remarks

The geometry of an EQRCode objects is described by its position and by the position of its finder pattern centers.

EQRCode.GetCellPosition

Position of a cell of the QR code in the Image/ROI.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQuadrangle GetCellPosition(
 int x,
 int y
 )
Euresys.Open_eVision.EQuadrangle GetCellPosition(
 Euresys.Open_eVision.EMatrixPosition position
 )
```

Parameters

x

The horizontal index of the cell in the QR code symbol.

y

The vertical index of the cell in the QR code symbol.

position

The position of the cell in the QR code symbol.

EQRCode.GetDecodedString

String containing the concatenated decoded data of the decoded stream.

Namespace: Euresys.Open_eVision

```
[C#]
string GetDecodedString(
 )
string GetDecodedString(
 Euresys.Open_eVision.EByteInterpretationMode byteInterpretationMode
 )
```

Parameters

byteInterpretationMode

The EByteInterpretationMode that should be used to interpret bytes.

Remarks

No parameter is required if no bytes are encoded or if the ECI byte encoding mode is supported.
Exception will be thrown if a parameter is required or if a wrong one is used.

The Hexadecimal parameter throws no exception and will return the bytes hexadecimal values wrapped between '0xEFBFBD'.
This mode overrides the ECI mode.
Sample : RC -> EFBFBD + RC + EFBFBD -> EFBFBD5243EFBFBD
Note: This method has currently limitations in .NET for byte encoded parts. A workaround is the conversion of the string to bytes then to UTF8.
See EByteInterpretationMode for more options.

EQRCode.IsDecodingReliable

Decoding reliabililty.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsDecodingReliable
  { get; }
```

EQRCode.IsGS1

Return true if the decoded string uses the GS1 standard.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsGS1(
 )
```

EQRCode.Iso15415GradingParameters

ISO/IEC 15415 grading parameters

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeIso15415GradingParameters Iso15415GradingParameters
  { get; }
```

Remarks

Grading will only be computed if EQRCodeReader::ComputeGrading is set to true.

EQRCode.Iso29158GradingParameters

ISO/IEC 29158 grading parameters

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeIso29158GradingParameters Iso29158GradingParameters
  { get; }
```

Remarks

Grading will only be computed if EQRCodeReader::ComputeGrading is set to true.

EQRCode.Level

Error correction level of the QR code.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeLevel Level
  { get; }
```

Remarks

The EQRCodeLevel enum contains the four possible values, L, M, Q, H.

EQRCode.Model

Model of the QR code.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeModel Model
  { get; }
```

Remarks

Possible values are part of the EQRCodeModel enum.

EQRCode.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCode operator=(
 Euresys.Open_eVision.EQRCode other
 )
```

Parameters

other

The EQRCode object that should be copied

EQRCode.UnusedErrorCorrection

Unused error correction.

Namespace: Euresys.Open_eVision

```
[C#]
float UnusedErrorCorrection
  { get; }
```

Remarks

Returns the amount of unused error correction as a percentage.
This parameter ranges from 0 to 1. Returns -1 if error correction failed (too many errors).

EQRCode.Version

Version of the QR code.

Namespace: Euresys.Open_eVision

```
[C#]
uint Version
  { get; }
```

Remarks

The version of a QR code indicates its size in terms of module number per line (number of module per line = 17+4*version).

4.202. EQRCodeDecodedStream Class

Represents the complete decoded stream extracted from a QR code, EQRCode.

Namespace: Euresys.Open_eVision

Properties

ApplicationIndicator	Application indicator.
CodingMode	Coding mode used in the decoded QR code. Returned as one of the EQRCodeCodingMode enum value.
DecodedStreamParts	Decoded stream parts, EQRCodeDecodedStreamPart.
RawBitstream	Raw bit stream as a vector of bytes.

Methods

EQRCodeDecodedStream	Creates an EQRCodeDecodedStream object.
operator=	Assignment operator

EQRCodeDecodedStream.ApplicationIndicator

Application indicator.

Namespace: Euresys.Open_eVision

```
[C#]
uint ApplicationIndicator
  { get; }
```

Remarks

The application indicator is relevant if the coding mode of the QR code is Fnc1_Aim only.

EQRCodeDecodedStream.CodingMode

Coding mode used in the decoded QR code. Returned as one of the EQRCodeCodingMode enum value.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeCodingMode CodingMode
  { get; }
```

EQRCodeDecodedStream.DecodedStreamParts

Decoded stream parts, EQRCodeDecodedStreamPart.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeDecodedStreamPart[] DecodedStreamParts
  { get; }
```

EQRCodeDecodedStream.EQRCodeDecodedStream

Creates an EQRCodeDecodedStream object.

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeDecodedStream(
 )
void EQRCodeDecodedStream(
 Euresys.Open_eVision.EQRCodeDecodedStream other
 )
```

Parameters

other

Another EQRCodeDecodedStream.

EQRCodeDecodedStream.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeDecodedStream operator=(
 Euresys.Open_eVision.EQRCodeDecodedStream other
 )
```

Parameters

other

The EQRCodeDecodedStream object that should be copied

EQRCodeDecodedStream.RawBitstream

Raw bit stream as a vector of bytes.

Namespace: Euresys.Open_eVision

```
[C#]
byte[] RawBitstream
  { get; }
```

Remarks

The raw bit stream is the bit stream of the QR code after unmasking and error correction, but before decoding.

4.203. EQRCodeDecodedStreamPart Class

Represents part of a decoded stream, EQRCodeDecodedStream, extracted from a QR code (EQRCode).

Namespace: Euresys.Open_eVision

Properties

DecodedData	Decoded data of this part of the decoded stream represented as a vector of bytes.
ECITableIndicator	Extended Channel Interpretation (ECI) table indicator.
Encoding	Encoding scheme used for this part of the decoded stream. Available values are contained in the EQRCodeEncoding enum.

Methods

EQRCodeDecodedStreamPart	Creates an EQRCodeDecodedStreamPart object.
GetDecodedString	String containing the concatenated decoded data of this part of the decoded stream.
operator=	Assignment operator

EQRCodeDecodedStreamPart.DecodedData

Decoded data of this part of the decoded stream represented as a vector of bytes.

Namespace: Euresys.Open_eVision

[C#]

```
byte[] DecodedData
  { get; }
```

EQRCodeDecodedStreamPart.ECITableIndicator

Extended Channel Interpretation (ECI) table indicator.

Namespace: Euresys.Open_eVision

[C#]

```
int ECITableIndicator
  { get; }
```

Remarks

The ECI table indicator is relevant if the coding mode of the QR code is ECI only. Value is otherwise set to -1.

EQRCodeDecodedStreamPart.Encoding

Encoding scheme used for this part of the decoded stream. Available values are contained in the EQRCodeEncoding enum.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeEncoding Encoding
  { get; }
```

EQRCodeDecodedStreamPart.EQRCodeDecodedStreamPart

Creates an EQRCodeDecodedStreamPart object.

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeDecodedStreamPart(
 )

void EQRCodeDecodedStreamPart(
 Euresys.Open_eVision.EQRCodeDecodedStreamPart other
 )
```

Parameters

other

Another EQRCodeDecodedStreamPart.

EQRCodeDecodedStreamPart.GetDecodedString

String containing the concatenated decoded data of this part of the decoded stream.

Namespace: Euresys.Open_eVision

```
[C#]
string GetDecodedString(
 )
string GetDecodedString(
 Euresys.Open_eVision.EByteInterpretationMode byteInterpretationMode
 )
```

Parameters

byteInterpretationMode

The EByteInterpretationMode that should be used to interpret bytes.

Remarks

No parameter is required if no bytes are encoded or if the ECI byte encoding mode is supported.
Exception will be thrown if a parameter is required or if a wrong one is used.

The Hexadecimal parameter throws no exception and will return the bytes hexadecimal values wrapped between '0xEFBFBD'.
This mode overrides the ECI mode.
Sample : RC -> EFBFBD + RC + EFBFBD -> EFBFBD5243EFBFBD

Note: This method has currently limitations in .NET for byte encoded parts. A workaround is the conversion of the string to bytes then to UTF8.
See EByteInterpretationMode for more options.

EQRCodeDecodedStreamPart.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeDecodedStreamPart operator=(
 Euresys.Open_eVision.EQRCodeDecodedStreamPart other
 )
```

Parameters

other

The EQRCodeDecodedStreamPart object that should be copied.

4.204. EQRCodeGeometry Class

Represents the geometry of a QR code.
This geometry is composed of the position of the QR code and the finder pattern centers.

Namespace: Euresys.Open_eVision

Properties

FinderPatternCenters	Finder patterns centers.
Position	Position of the QR code returned as an EQuadrangle object.

Methods

Draw	Draws the QR code geometry.
DrawWithCurrentPen	Draws the QR code geometry using the pen currently set in the graphical context.
EQRCodeGeometry	Constructs an EQRCodeGeometry object.
operator=	Assignment operator.

EQRCodeGeometry.Draw

Draws the QR code geometry.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter
Draw adapter.
zoomX
Horizontal zooming factor.
zoomY
Vertical zooming factor.
panX
Horizontal panning value expressed in pixels.
panY
Vertical panning value expressed in pixels.
hDC
-

Remarks

The zoomX, zoomY, panX and panY parameters can be used to scale and/or translate the drawing operations. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQRCodeGeometry.DrawWithCurrentPen

This method is deprecated.

Draws the QR code geometry using the pen currently set in the graphical context.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr hDC,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hDC
Handle to the device context of the destination window.
zoomX
Horizontal zooming factor.
zoomY
Vertical zooming factor.
panX
Horizontal panning value expressed in pixels.

panY

Vertical panning value expressed in pixels.

Remarks

The zoomX, zoomY, panX and panY parameters can be used to scale and/or translate the drawing operations. Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQRCodeGeometry.EQRCodeGeometry

Constructs an EQRCodeGeometry object.

Namespace: Euresys.Open_eVision

```
[C#]
void EQRCodeGeometry(
 )
void EQRCodeGeometry(
 Euresys.Open_eVision.EQRCodeGeometry other
 )
void EQRCodeGeometry(
 Euresys.Open_eVision.EQuadrangle position,
 Euresys.Open_eVision.EPoint[] finderPatternCenters
 )
```

Parameters

other

Another EQRCodeGeometry.

position

The position of the QR code represented as an EQuadrangle object.

finderPatternCenters

The vector of Finder Pattern centers.

Remarks

In case of a Micro QR code (not yet supported), there must be only one finder pattern center. In case of another QR code, there must be three finder pattern centers, entered in the following order: top right, top left, bottom left.
The corners of the EQuadrangle must be entered in the following order : top right, top left, bottom left, bottom right.

EQRCodeGeometry.FinderPatternCenters

Finder patterns centers.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint[] FinderPatternCenters
  { get; }
```

Remarks

In case of a Micro QR code, there is only one finder pattern center. In case of another QR code, there are three finder pattern centers, returned in the following order: top right, top left, bottom left.

EQRCodeGeometry.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeGeometry operator=(
 Euresys.Open_eVision.EQRCodeGeometry other
 )
```

Parameters

other

Another EQRCodeGeometry.

EQRCodeGeometry.Position

Position of the QR code returned as an EQuadrangle object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQuadrangle Position
  { get; }
```

4.205. EQRCodeGrid Class

Represents a grid of QR Codes

Namespace: Euresys.Open_eVision

Properties

EnableAll	Enable/Disable all cells
NumCols	Returns the number of columns in the grid

NumRows	Returns the number of rows in the grid

Methods

EQRCodeGrid	Creates an EQRCodeGrid object.
GetCellEnabled	Returns true if Cell is enabled and false otherwise
GetResults	Returns the QR Codes detected
operator=	Assignment operator
SetEnableCell	Enable/Disable Cell
SetEnableColumn	Enable/Disable Column
SetEnableRow	Enable/Disable Row

EQRCodeGrid.EnableAll

Enable/Disable all cells

Namespace: Euresys.Open_eVision

[C#]

```
bool EnableAll
  { get; set; }
```

Remarks

By default, all grid cells are enabled.

EQRCodeGrid.EQRCodeGrid

Creates an EQRCodeGrid object.

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeGrid(
 )

void EQRCodeGrid(
 Euresys.Open_eVision.EQRCodeGrid other
 )

void EQRCodeGrid(
 uint numCols,
 uint numRows
 )
```

Parameters

other

The reference EQRCodeGrid instance to copy this one from.

numCols

The number of columns in the grid.

numRows

The number of rows in the grid.

EQRCodeGrid.GetCellEnabled

Returns true if Cell is enabled and false otherwise

Namespace: Euresys.Open_eVision

[C#]

```
bool GetCellEnabled(
 uint column,
 uint row
 )
```

Parameters

column

-

row

-

Remarks

By default, all grid cells are enabled.

EQRCodeGrid.GetResults

Returns the QR Codes detected

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCode[] GetResults(
 uint column,
 uint row
 )
Euresys.Open_eVision.EQRCode[] GetResults(
 )
```

Parameters

column

The column of a cell.

row

The row of a cell.

EQRCodeGrid.NumCols

Returns the number of columns in the grid

Namespace: Euresys.Open_eVision

[C#]

```
uint NumCols
  { get; }
```

EQRCodeGrid.NumRows

Returns the number of rows in the grid

Namespace: Euresys.Open_eVision

[C#]

```
uint NumRows
  { get; }
```

EQRCodeGrid.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeGrid operator=(
 Euresys.Open_eVision.EQRCodeGrid other
 )
```

Parameters

other

The EQRCodeGrid instance to assign.

EQRCodeGrid.SetEnableCell

Enable/Disable Cell

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableCell(
 uint column,
 uint row,
 bool enable
 )
```

Parameters

column

-

row

-

enable

-

Remarks

By default, all grid cells are enabled.

EQRCodeGrid.SetEnableColumn

Enable/Disable Column

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableColumn(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

EQRCodeGrid.SetEnableRow

Enable/Disable Row

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableRow(
 uint row,
 bool enable
 )
```

Parameters

row

-

enable

-

Remarks

By default, all grid cells are enabled.

4.206. EQRCodeReader Class

Represents the QR code reader, that is a context for the detection and decoding of QR codes, represented by EQRCode objects.

Namespace: Euresys.Open_eVision

Properties

CellPolarityConfidenceThreshold	Sets the minimun cell polarity confidence threshold. When the cell confidence is under the threshold, additional processing is attempted to improve its polarity detection. The cell polarity confidence reflects the confidence in the cell digitization result, on a scale from 0 to 1. Increasing the threshold can improve reading of overprinted or underprinted QR codes. Default: 0.2f.
ComputeGrading	Allows to choose whether the grading properties of the EQRCode object will be computed by the EQRCodeReader::Read method. The default setting for this property is `false`.
DetectionMethod	Sets the detection method for finding QR codes. The method can be any combination of the EQRDetectionMethod enums.
DetectionTradeOff	This setting controls the trade-off between computation speed versus reliability of the algorithm and particularly of the detection methods. Setting the trade-off will overwrite the current settings for EQRCodeScanPrecision and EQRDetectionMethod.
FilterOutUnreliablyDecodedQRCodes	Activate or deactivate the filtering of unreliably decoded QR codes.

ForegroundDetectionThreshold	Foreground detection threshold. This parameter determines by how many grayscale-values a pixel should deviate from it's local background to be considered part of the foreground.
MaximumVersion	Maximum version of QR codes to be searched for.
MaxNumCodes	Maximum number of QR codes to find in a single Image/ROI.
MinimumIsotropy	QR code minimum isotropy.
MinimumScore	Minimum pattern finder score that must be reached to consider that a finder pattern has been found.
MinimumVersion	Minimum version of QR codes to be searched for.
ScanPrecision	Precision of the EQRCodeReader when scanning the search field.
SearchedModels	QR code models to be searched for.
SearchField	Search field for the QR code reader.
TimeOut	Time-out for the EQRCodeReader::Read method.

Methods

EQRCodeReader	Creates an EQRCodeReader object.
Load	Load the configuration for this EQRCodeReader instance.
operator=	Assignment operator
Read	Detects and decodes all the QR codes in the search field. Returns them as EQRCode objects.
Save	Save the configuration for this EQRCodeReader instance.

EQRCodeReader.CellPolarityConfidenceThreshold

Sets the minimun cell polarity confidence threshold.
When the cell confidence is under the threshold, additional processing is attempted to improve its polarity detection. The cell polarity confidence reflects the confidence in the cell digitization result, on a scale from 0 to 1. Increasing the threshold can improve reading of overprinted or underprinted QR codes. Default: 0.2f.

Namespace: Euresys.Open_eVision

[C#]

```
float CellPolarityConfidenceThreshold
  { get; set; }
```

Remarks

Large values can affect the speed and will increase the probability of false positive changes.

EQRCodeReader.ComputeGrading

Allows to choose whether the grading properties of the EQRCode object will be computed by the EQRCodeReader::Read method. The default setting for this property is false.

Namespace: Euresys.Open_eVision

[C#]

```
bool ComputeGrading
  { get; set; }
```

Remarks

This setting is not available for Micro QR code symbols.

EQRCodeReader.DetectionMethod

Sets the detection method for finding QR codes. The method can be any combination of the EQRDetectionMethod enums.

Namespace: Euresys.Open_eVision

[C#]

```
int DetectionMethod
  { get; set; }
```

Remarks

The default value is: 'EQRDetectionMethod_Gradient|EQRDetectionMethod_ AdaptiveThreshold'.

EQRCodeReader.DetectionTradeOff

This setting controls the trade-off between computation speed versus reliability of the algorithm and particularly of the detection methods.
Setting the trade-off will overwrite the current settings for EQRCodeScanPrecision and EQRDetectionMethod.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRDetectionTradeOff DetectionTradeOff
  { get; set; }
```

Remarks

Available values are defined by EQRDetectionTradeOff. The default value is **EQRDetectionTradeOff_Balanced**.

EQRCodeReader.EQRCodeReader

Creates an EQRCodeReader object.

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeReader(
 )
void EQRCodeReader(
 Euresys.Open_eVision.EQRCodeReader other
 )
```

Parameters

other

Another EQRCodeReader object to be copied in the new EQRCodeReader object.

EQRCodeReader.FilterOutUnreliablyDecodedQRCodes

Activate or deactivate the filtering of unreliably decoded QR codes.

Namespace: Euresys.Open_eVision

[C#]

```
bool FilterOutUnreliablyDecodedQRCodes
  { get; set; }
```

Remarks

By default, the QR code reader does not return unreliably decoded QR codes.

EQRCodeReader.ForegroundDetectionThreshold

Foreground detection threshold. This parameter determines by how many grayscale-values a pixel should deviate from it's local background to be considered part of the foreground.

Namespace: Euresys.Open_eVision

[C#]

```
int ForegroundDetectionThreshold
  { get; set; }
```

Remarks

In most cases, changing the value of this parameter is not required. A small threshold value may help to locate codes in low contrast images. If you think you might need to use this parameter, contact technical support for advice. The default value for this parameter is 10.

EQRCodeReader.Load

Load the configuration for this EQRCodeReader instance.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path from which to load the configuration.

serializer

The given ESerializer, it must have been created for reading.

EQRCodeReader.MaximumVersion

Maximum version of QR codes to be searched for.

Namespace: Euresys.Open_eVision

```
[C#]
uint MaximumVersion
  { get; set; }
```

Remarks

This parameter value ranges from 1 to 40. Default value: 40.

EQRCodeReader.MaxNumCodes

Maximum number of QR codes to find in a single Image/ROI.

Namespace: Euresys.Open_eVision

```
[C#]
uint MaxNumCodes
  { get; set; }
```

Remarks

By default, this parameter is set to 1.

EQRCodeReader.MinimumIsotropy

QR code minimum isotropy.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumIsotropy
  { get; set; }
```

Remarks

The isotropy of a QR code is defined as its short side divided by its long side.
This parameter value ranges from 0 to 1. Default value: 0.75.

EQRCodeReader.MinimumScore

Minimum pattern finder score that must be reached to consider that a finder pattern has been found.

Namespace: Euresys.Open_eVision

```
[C#]
float MinimumScore
  { get; set; }
```

Remarks

The pattern finder score is based on a normalized correlation with a perfect finder pattern model.
A perfect match with the model would return a score of 1.
This parameter value ranges from 0 to 1. Default value: 0.7.

EQRCodeReader.MinimumVersion

Minimum version of QR codes to be searched for.

Namespace: Euresys.Open_eVision

```
[C#]
uint MinimumVersion
  { get; set; }
```

Remarks

This parameter value ranges from 1 to 40. Default value: 1.

EQRCodeReader.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeReader operator=(
 Euresys.Open_eVision.EQRCodeReader other
 )
```

Parameters

other

The object that should be copied

EQRCodeReader.Read

Detects and decodes all the QR codes in the search field. Returns them as EQRCode objects.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCode[] Read(
 )

Euresys.Open_eVision.EQRCode[] Read(
 Euresys.Open_eVision.EROIBW8 field
 )

Euresys.Open_eVision.EQRCode[] Read(
 Euresys.Open_eVision.EROIBW8 field,
 Euresys.Open_eVision.ERegion region
 )

Euresys.Open_eVision.EQRCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 field,
 int numCellsX,
 int numCellsY,
 float extension
 )

Euresys.Open_eVision.EQRCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 field,
 Euresys.Open_eVision.ERectangleRegion area,
 int numCellsX,
 int numCellsY,
 float extension
 )
```

```
Euresys.Open_eVision.EQRCodeGrid Read(
 Euresys.Open_eVision.EROIBW8 field,
 Euresys.Open_eVision.ERectangleRegion area,
 Euresys.Open_eVision.EQRCodeGrid grid,
 float extension
 )
```

Parameters

field

The search field.

region

Region into the search field where the qr codes have to be found.

numCellsX

Number of grid cells in the X direction

numCellsY

Number of grid cells in the Y direction

extension

Extension of the grid cells to allow cell overlap. For instance, 0.0f means no extension and 0.1f means a 10% cell size extension.

area

Rectangular Region used as the full grid area

grid

Grid with cell disabling capabilities

Remarks

The grid overload allows you to disable some cells of the grid if those cells are not supposed to contain QR Codes. See the EQRCodeGrid class documentation for more information.

EQRCodeReader.Save

Save the configuration for this EQRCodeReader instance.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The path to which to save the configuration.

serializer

The given ESerializer, it must have been created for writing.

EQRCodeReader.ScanPrecision

Precision of the EQRCodeReader when scanning the search field.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeScanPrecision ScanPrecision
  { get; set; }
```

Remarks

Available values are defined by EQRCodeScanPrecision. The default value is **EQRCodeScanPrecision_Automatic**.

EQRCodeReader.SearchedModels

QR code models to be searched for.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQRCodeModel[] SearchedModels
  { get; set; }
```

Remarks

By default, the QR code reader searches for Model1 and Model2.

EQRCodeReader.SearchField

Search field for the QR code reader.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW8 SearchField
  { get; set; }
```

EQRCodeReader.TimeOut

Time-out for the EQRCodeReader::Read method.

Namespace: Euresys.Open_eVision

[C#]

```
System.UInt64 TimeOut
  { get; set; }
```

Remarks

If the processing time of one of these functions becomes longer than the set time-out, the processing is stopped and an exception is thrown.
In that case, the error code of the exception is TimeoutReached.
The time-out is set in microseconds.
This time-out is not a real time-out.
The processing is stopped as soon as possible after the time-out has been reached.
This means that the time elapsed effectively in the method can be greater than the time-out itself.

4.207. EQuadrangle Class

This class represents a polygon with four corners (with sub-pixel accuracy).

Remarks

A quadrangle especially arises when representing the corners of a rotated bounding box.
Namespace: Euresys.Open_eVision

Properties

Area	Returns the area of the quadrangle.
Corners	The corners of the EQuadrangle.
GravityCenter	Returns the gravity center of the quadrangle.
Perimeter	Returns the perimeter of the quadrangle.
UpperLeftCorner	Returns the coordinates of the upper left corner of the quadrangle (the position with the minimum Y and then minimum X).

Methods

Draw	Draws the quadrangle, by drawing lines between its corners.
DrawWithCurrentPen	Draws the quadrangle, by drawing lines between its corners.
EQuadrangle	Constructs a EQuadrangle. The default constructor initializes all points to 0.
GetCornerAngle	Returns the angle of a given corner of the quadrangle.
GetPoint	Returns the coordinate of a given corner of the quadrangle.
GetSideAngle	Returns the angle of a given side of the quadrangle.
GetSideLength	Returns the length of a given side of the quadrangle.
IsPointInside	Tests if a point is inside the quadrangle.

IsQuadrangleInside	Tests if a quadrangle is inside the quadrangle.
operator=	Assignment operator.
OverLaps	Tests if the quadrangles overlap.
SetPoint	Sets the coordinates of a given corner of the quadrangle.

EQuadrangle.Area

Returns the area of the quadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
float Area
  { get; }
```

EQuadrangle.Corners

The corners of the EQuadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint[] Corners
  { get; }
```

Remarks

If the EQuadrangle belongs to an EQRCodeGeometry object, the corners are returned in the following order: top right, top left, bottom left, bottom right.

EQuadrangle.Draw

Draws the quadrangle, by drawing lines between its corners.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

```
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not lines are to be drawn between the 1st and 3rd corners, as well as between the 2nd and 4th corners.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQuadrangle.DrawWithCurrentPen

This method is deprecated.

Draws the quadrangle, by drawing lines between its corners.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

drawDiagonals

Specifies whether or not lines are to be drawn between the 1st and 3rd corners, as well as between the 2nd and 4th corners.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EQuadrangle.EQuadrangle

Constructs a EQuadrangle. The default constructor initializes all points to 0.

Namespace: Euresys.Open_eVision

[C#]

```
void EQuadrangle(
 )

void EQuadrangle(
 Euresys.Open_eVision.EPoint[] corners
 )

void EQuadrangle(
 Euresys.Open_eVision.EQuadrangle other
 )
```

Parameters

corners

The corners of the EQuadrangle.

other

The source EQuadrangle.

EQuadrangle.GetCornerAngle

Returns the angle of a given corner of the quadrangle.

Namespace: Euresys.Open_eVision

```
[C#]
float GetCornerAngle(
 uint cornerIndex
 )
```

Parameters

cornerIndex

-

EQuadrangle.GetPoint

Returns the coordinate of a given corner of the quadrangle.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 uint index
 )
```

Parameters

index

The index of the corner of interest (must lie in the range between 0 and 3, inclusive).

EQuadrangle.GetSideAngle

Returns the angle of a given side of the quadrangle.

Namespace: Euresys.Open_eVision

```
[C#]
float GetSideAngle(
 uint sideIndex
 )
```

Parameters

sideIndex

The index of the side of interest (must lie in the range between 0 and 3, inclusive).

EQuadrangle.GetSideLength

Returns the length of a given side of the quadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
float GetSideLength(
 uint sideIndex
 )
```

Parameters

sideIndex

The index of the side of interest (must lie in the range between 0 and 3, inclusive).

EQuadrangle.GravityCenter

Returns the gravity center of the quadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GravityCenter
  { get; }
```

EQuadrangle.IsPointInside

Tests if a point is inside the quadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsPointInside(
 Euresys.Open_eVision.EPoint point,
 bool includeEdges
 )
```

Parameters

point

-

includeEdges

Takes the edges as part of the interior of the EQuadrangle. Default: false.

EQuadrangle.IsQuadrangleInside

Tests if a quadrangle is inside the quadrangle.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsQuadrangleInside(
 Euresys.Open_eVision.EQuadrangle quadrangle,
 bool includeEdges
 )
```

Parameters

quadrangle

-

includeEdges

Takes the edges as part of the interior of the EQuadrangle. Default: false.

EQuadrangle.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQuadrangle operator=(
 Euresys.Open_eVision.EQuadrangle other
 )
```

Parameters

other

The source EQuadrangle.

EQuadrangle.OverLaps

Tests if the quadrangles overlap.

Namespace: Euresys.Open_eVision

[C#]

```
bool OverLaps(
 Euresys.Open_eVision.EQuadrangle other
 )
```

Parameters

other

The EQuadrangle to test.

EQuadrangle.Perimeter

Returns the perimeter of the quadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
float Perimeter
  { get; }
```

EQuadrangle.SetPoint

Sets the coordinates of a given corner of the quadrangle.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPoint(
 uint index,
 Euresys.Open_eVision.EPoint location
 )
```

Parameters

index

The index of the corner of interest (must lie in the range between 0 and 3, inclusive).

location

The coordinate.

EQuadrangle.UpperLeftCorner

Returns the coordinates of the upper left corner of the quadrangle (the position with the minimum Y and then minimum X).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint UpperLeftCorner
  { get; }
```

4.208. ERandomDecimator Class

Decimation of an EPointCloud.
The random decimator decimates a point cloud by copying a specified number of points, randomly selected, to a new point cloud.

Base Class:EDecimator

Namespace: Euresys.Open_eVision.Easy3D

Properties

NumberOfPoints	Sets/gets the parameter "number of points" (number of points after decimation).

Methods

Decimate	Decimates a given EPointCloud and writes the result into a new point cloud.
ERandomDecimator	Creates an ERandomDecimator object. If the required number of points (after decimation) is not specified, the default value is 10000.
operator!=	test inequality between two ERandomDecimator.
operator=	Assignment operator.
operator==	test equality between two ERandomDecimator.

ERandomDecimator.Decimate

Decimates a given EPointCloud and writes the result into a new point cloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Decimate(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut
 )
```

Parameters

cloudIn

The input point cloud.

cloudOut

The output point cloud.

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

ERandomDecimator.ERandomDecimator

Creates an ERandomDecimator object. If the required number of points (after decimation) is not specified, the default value is 10000.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ERandomDecimator(
 )
void ERandomDecimator(
 int numberOfPoints
 )
void ERandomDecimator(
 Euresys.Open_eVision.Easy3D.ERandomDecimator other
 )
```

Parameters

numberOfPoints

Number of points after decimation.

other

Reference to the ERandomDecimator object used for the initialization.

ERandomDecimator.NumberOfPoints

Sets/gets the parameter "number of points" (number of points after decimation).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
int NumberOfPoints
  { get; set; }
```

ERandomDecimator.operator!=

test inequality between two ERandomDecimator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator!=(
 Euresys.Open_eVision.Easy3D.EDecimator other
 )
```

Parameters

other

the ERandomDecimator to be compared with

ERandomDecimator.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ERandomDecimator operator=(
 Euresys.Open_eVision.Easy3D.ERandomDecimator other
 )
```

Parameters

other

The ERandomDecimator object that should be copied.

ERandomDecimator.operator==

test equality between two ERandomDecimator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.EDecimator other
 )
```

Parameters

other

the ERandomDecimator to be compared with

4.209. ERectangle Class

Represents a model of a rectangle.

Base Class:EFrame

Namespace: Euresys.Open_eVision

Properties

SizeX	X size of the ERectangle
SizeY	Y size of the ERectangle

Methods

CopyTo	Copies all the data of the current ERectangle object into another ERectangle object, and returns it.
ERectangle	Constructs a ERectangle
GetCorners	Retrieves the coordinates of each corner of a ERectangle object.
GetEdges	Retrieves each edge of a ERectangle object.
GetMidEdges	Retrieves the center coordinates of each edge of a ERectangle object.
GetPoint	Returns the coordinates of a particular point, specified by its location in the ERectangle area.
operator=	Copies all the data from another ERectangle object into the current ERectangle object
SetFromOppositeCorners	Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.
SetFromOriginMiddleEnd	DEPRECATED (you should use ERectangle::SetFromThreeCorners): Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.
SetFromThreeCorners	Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.
SetFromTwoPoints	DEPRECATED (you should use ERectangle::SetFromOppositeCorners): Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.
SetSize	Sets the size of a ERectangle object.

ERectangle.CopyTo

Copies all the data of the current ERectangle object into another ERectangle object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.ERectangle other
 )

Euresys.Open_eVision.ERectangle CopyTo(
 Euresys.Open_eVision.ERectangle other
 )
```

Parameters

other

Pointer to the ERectangle object in which the current ERectangle object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ERectangle object will be created and returned.

ERectangle.ERectangle

Constructs a ERectangle

Namespace: Euresys.Open_eVision

[C#]

```
void ERectangle(
 )

void ERectangle(
 Euresys.Open_eVision.EPoint center,
 float sizeX,
 float sizeY,
 float angle
 )

void ERectangle(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )

void ERectangle(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end
 )

void ERectangle(
 Euresys.Open_eVision.ERectangle other
 )
```

Parameters

center
Center coordinates of the rectangle at its nominal position. The default value is (0,0).
sizeX
Nominal size X/Y of the rectangle. Both default values are 100.
sizeY
Nominal size X/Y of the rectangle. Both default values are 100.
angle
Nominal rotation angle of the rectangle. The default value is 0.
origin
Upper left point coordinates of the rectangle.
end
Lower right point coordinates of the rectangle.
middle
A third corner point coordinates.
other
Another ERectangle object to be copied in the new ERectangle object.

ERectangle.GetCorners

Retrieves the coordinates of each corner of a ERectangle object.

Namespace: Euresys.Open_eVision

[C#]

```
void GetCorners(
 Euresys.Open_eVision.EPoint xy,
 Euresys.Open_eVision.EPoint XXy,
 Euresys.Open_eVision.EPoint xYY,
 Euresys.Open_eVision.EPoint XXYY
 )
```

Parameters

xy
Coordinates of the lower leftmost corner of the ERectangle object.
XXy
Coordinates of the lower rightmost corner of the ERectangle object.
xYY
Coordinates of the upper leftmost corner of the ERectangle object.
XXYY
Coordinates of the upper rightmost corner of the ERectangle object.

ERectangle.GetEdges

Retrieves each edge of a ERectangle object.

Namespace: Euresys.Open_eVision

```
[C#]
void GetEdges(
 Euresys.Open_eVision.ELine x,
 Euresys.Open_eVision.ELine XX,
 Euresys.Open_eVision.ELine y,
 Euresys.Open_eVision.ELine YY
 )
```

Parameters

x
Leftmost edge of the ERectangle object.

XX
Rightmost edge of the ERectangle object.

y
Lower edge of the ERectangle object.

YY
Upper edge of the ERectangle object.

ERectangle.GetMidEdges

Retrieves the center coordinates of each edge of a ERectangle object.

Namespace: Euresys.Open_eVision

```
[C#]
void GetMidEdges(
 Euresys.Open_eVision.EPoint x,
 Euresys.Open_eVision.EPoint XX,
 Euresys.Open_eVision.EPoint y,
 Euresys.Open_eVision.EPoint YY
 )
```

Parameters

x
Center coordinates of the leftmost edge of the ERectangle object.

XX
Center coordinates of the rightmost edge of the ERectangle object.

y
Center coordinates of the lower edge of the ERectangle object.

YY
Center coordinates of the upper edge of the ERectangle object.

ERectangle.GetPoint

Returns the coordinates of a particular point, specified by its location in the ERectangle area.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 float fractionX,
 float fractionY
 )
```

Parameters

fractionX

Point location expressed as a fraction of the ERectangle vertical edges (range -1, +1).

fractionY

Point location expressed as a fraction of the ERectangle horizontal edges (range -1, +1).

ERectangle.operator=

Copies all the data from another ERectangle object into the current ERectangle object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERectangle operator=(
 Euresys.Open_eVision.ERectangle other
 )
```

Parameters

other

ERectangle object to be copied

ERectangle.SetFromOppositeCorners

Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOppositeCorners(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Upper left point coordinates of the rectangle.

end

Lower right point coordinates of the rectangle.

ERectangle.SetFromOriginMiddleEnd

This method is deprecated.

DEPRECATED (you should use ERectangle::SetFromThreeCorners): Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Upper left point coordinates of the rectangle.

middle

A third corner point coordinates.

end

Lower right point coordinates of the rectangle.

ERectangle.SetFromThreeCorners

Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromThreeCorners(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin
Upper left point coordinates of the rectangle.

middle
A third corner point coordinates.

end
Lower right point coordinates of the rectangle.

ERectangle.SetFromTwoPoints

This method is deprecated.

DEPRECATED (you should use ERectangle::SetFromOppositeCorners): Sets the geometric parameters (center coordinates, size, and rotation angle) of an ERectangle object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin
Upper left point coordinates of the rectangle.

end
Lower right point coordinates of the rectangle.

ERectangle.SetSize

Sets the size of a ERectangle object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSize(
 float sizeX,
 float sizeY
 )
```

Parameters

sizeX

Nominal size X of the ERectangle object. Default values is 100.

sizeY

Nominal size Y of the ERectangle object. Default values is 100.

Remarks

A ERectangle object is fully defined knowing its nominal position (given by the coordinates of its center), its nominal size, its rotation angle and its outline tolerance. By default, the width and height values are 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

ERectangle.SizeX

X size of the ERectangle

Namespace: Euresys.Open_eVision

```
[C#]
float SizeX
  { get; }
```

ERectangle.SizeY

Y size of the ERectangle

Namespace: Euresys.Open_eVision

```
[C#]
float SizeY
  { get; }
```

4.210. ERectangleGauge Class

Manages a rectangle fitting gauge.

Base Class:ERectangleShape
Namespace: Euresys.Open_eVision

Properties

Active	Sets the flag indicating whether the gauge is active or not.
ActiveEdges	Active edges as defined in EDragHandle.
AverageDistance	Average distance between the sampled points and the fitted model.

FilteringThreshold	Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.
HVConstraint	Status of the restriction on the orientation of the point location gauge or model fitting sample paths.
InnerFilteringEnabled	Getter method for the GetInnerFilteringEnabled property. This property is the flag indicating if the inner sampled point filtering is enabled (true).
InnerFilteringThreshold	Sampled point inner filtering threshold.
KnownAngle	Flag indicating whether the rotation angle of the rectangle to be fitted is known or not.
MeasuredRectangle	Information pertaining to the fitted rectangle.
MinAmplitude	Offset added to the Threshold when a peak is to be detected.
MinArea	Minimum area value.
NumFilteringPasses	Number of filtering passes for a model fitting operation.
NumSamples	Number of sampled points during the model fitting operation.
NumSamplesLeftEdge	Number of sampled points found on leftmost edge during the measure operation.
NumSamplesLowerEdge	Number of sampled points found on lower edge during the measure operation.
NumSamplesRightEdge	Number of sampled points found on rightmost edge during the measure operation.
NumSamplesUpperEdge	Number of sampled points found on upper edge during the measure operation.
NumSamplesx	Number of sampled points found on edge x during the measure operation.
NumSamplesX	Number of sampled points found on edge X during the measure operation.
NumSamplesy	Number of sampled points found on edge y during the measure operation.
NumSamplesY	Number of sampled points found on edge Y during the measure operation.
NumSkipRanges	Number of skip ranges in the gauge after a call to ERectangleGauge::AddSkipRange.
NumValidSamples	Number of valid sample points remaining after a model fitting operation.
RectangularSamplingArea	Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.
SamplingStep	Approximate distance between sampled points during a model fitting operation.
Smoothing	Number of pixels used for the low-pass filtering operation.
Thickness	Number of parallel segments used to extract the data profile.

Threshold	Threshold level used to delimit significant peaks in the data profile.
Tolerance	Searching area half thickness of the rectangle fitting gauge.
TransitionChoice	Transition choice.
TransitionIndex	Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.
TransitionType	Transition type.
Type	Shape type.
Valid	Flag indicating if at least one valid transition has been found.

Methods

AddSkipRange	Adds an item to the set of skip ranges and returns the index of the newly added range.
CopyTo	Copies all the data of the current ERectangleGauge object into another ERectangleGauge object, and returns it.
DisableInnerFiltering	Disables inner sampled point filtering.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
ERectangleGauge	Constructs a rectangle measurement context.
GetMeasuredPoint	Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.
GetMinNumFitSamples	Returns the minimum number of samples required for fitting on each side of the shape.
GetSampleLeftEdge	Allows to retrieve information on the samples found along the leftmost edge.
GetSampleLowerEdge	Allows to retrieve information on the samples found along the lower edge.
GetSampleRightEdge	Allows to retrieve information on the samples found along the rightmost edge.
GetSampleUpperEdge	Allows to retrieve information on the samples found along the upper edge.
GetSamplex	Allows to retrieve information on the samples found along the x edge.
GetSampleX	Allows to retrieve information on the samples found along the X edge.
GetSampley	Allows to retrieve information on the samples found along the y edge.
GetSampleY	Allows to retrieve information on the samples found along the Y edge.

GetSkipRange	Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the ERectangleGauge::AddSkipRange method.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Measure	Triggers the point location or the model fitting operation.
MeasureSample	Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.
MeasureWithoutFitting	Triggers the point location without rectangle fitting operation.
operator=	Copies all the data from another ERectangleGauge object into the current ERectangleGauge object
Plot	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
PlotWithCurrentPen	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
Process	Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.
RemoveAllSkipRanges	Removes all the skip ranges previously created by a call to ERectangleGauge::AddSkipRange.
RemoveSkipRange	After a call to ERectangleGauge::AddSkipRange, removes the skip range with the given index.
SetMinNumFitSamples	Sets the minimum number of samples required for fitting on each side of the shape.

ERectangleGauge.Active

Sets the flag indicating whether the gauge is active or not.

Namespace: Euresys.Open_eVision

```
[C#]
override bool Active
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying ERectangleGauge::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process. By default, the gauge is active (true).

ERectangleGauge.ActiveEdges

Active edges as defined in EDragHandle.

Namespace: Euresys.Open_eVision

[C#]

```
uint ActiveEdges
  { get; set; }
```

Remarks

In the case of a rectangle fitting gauge, each edge can have its own transition detection parameters. Updating the transition parameters only affect the current active edges. By default, all edges are active.

ERectangleGauge.AddSkipRange

Adds an item to the set of skip ranges and returns the index of the newly added range.

Namespace: Euresys.Open_eVision

[C#]

```
uint AddSkipRange(
 uint start,
 uint end
 )
```

Parameters

start

Beginning of the skip range.

end

End of the skip range.

Remarks

The samples indices between start and end (including the boundaries) will be discarded during the measurement process.
The ERectangleGauge::AddSkipRange method allows to define skip ranges in an ERectangleGauge. This means that, at measure time, samples belonging to these ranges will not be taken into account.
A sample may belong to more than one skip range; to be discarded, a sample has to pertain to at least one range. Moreover, the skip ranges are allowed to overlap one another.
The range is allowed to be reversed (i.e. end is not required to be greater than start).
Also, start and end are not required to reference valid indices at the time of the call (i.e. the range may lie outside of the current return value for ERectangleGauge::NumSamples).

ERectangleGauge.AverageDistance

Average distance between the sampled points and the fitted model.

Namespace: Euresys.Open_eVision

[C#]

```
float AverageDistance
```

```
{ get; }
```

Remarks

Irrelevant in case of a point location operation.

ERectangleGauge.CopyTo

Copies all the data of the current ERectangleGauge object into another ERectangleGauge object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.ERectangleGauge other,
 bool recursive
 )

Euresys.Open_eVision.ERectangleGauge CopyTo(
 Euresys.Open_eVision.ERectangleGauge other,
 bool recursive
 )
```

Parameters

other

Pointer to the ERectangleGauge object in which the current ERectangleGauge object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ERectangleGauge object will be created and returned.

ERectangleGauge.DisableInnerFiltering

Disables inner sampled point filtering.

Namespace: Euresys.Open_eVision

[C#]

```
void DisableInnerFiltering(
 )
```

Remarks

The inner sampled point filtering is activated as soon as the corresponding ERectangleGauge::InnerFilteringThreshold is set.

ERectangleGauge.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y
 )
```

Parameters

x

Cursor current X coordinate.

y

Cursor current Y coordinate.

ERectangleGauge.Draw

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERectangleGauge.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERectangleGauge.ERectangleGauge

Constructs a rectangle measurement context.

Namespace: Euresys.Open_eVision

```
[C#]
void ERectangleGauge(
 )
void ERectangleGauge(
 Euresys.Open_eVision.ERectangleGauge other
 )
```

Parameters

other

Another ERectangleGauge object to be copied in the new ERectangleGauge object.

Remarks

With the default constructor, all the parameters are initialized to their respective default values.
With the copy constructor, the constructed rectangle measurement context is based on a pre-existing ERectangleGauge object. The gauge children are also copied. Hierarchy copying through a copy constructor is always recursive. To disable this recursion, use instead the ERectangleGauge::CopyTo method.

ERectangleGauge.FilteringThreshold

Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

Namespace: Euresys.Open_eVision

```
[C#]
float FilteringThreshold
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).

ERectangleGauge.GetMeasuredPoint

Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetMeasuredPoint(
 uint index
 )
```

Parameters

index

This argument must be left unchanged from its default value, i.e. ~0 (= 0xFFFFFFFF).

Remarks

These coordinates pertain to the world space; they are expressed in the reference frame to which the current ERectangleGauge object belongs. The gauging process uses a list of sample points to find the shape position and size that best fit a given image. These sample points are measured along the sample paths defined by the gauge geometry. ERectangleGauge::GetMeasuredPoint returns the coordinates of the sample point that meets the following two requirements: 1. It lies on the sample path inspected with the last call to ERectangleGauge::MeasureSample, and 1. Among all the sample points along the latter sample path, it is the one selected by the ERectangleGauge::TransitionChoice property.

Note. For this method to succeed, it is necessary to previously call ERectangleGauge::MeasureSample.

ERectangleGauge.GetMinNumFitSamples

Returns the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void GetMinNumFitSamples(
 out int side0,
 out int side1,
 out int side2,
 out int side3
 )
```

Parameters

side0

Minimum number of samples on the top side of the rectangle.

side1

Minimum number of samples on the left side of the rectangle.

side2

Minimum number of samples on the bottom side of the rectangle.

side3

Minimum number of samples on the right side of the rectangle.

Remarks

Irrelevant in case of a point location operation.

ERectangleGauge.GetSampleLeftEdge

Allows to retrieve information on the samples found along the leftmost edge.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetSampleLeftEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSampleLeftEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )
bool GetSampleLeftEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

ERectangleGauge.GetSampleLowerEdge

Allows to retrieve information on the samples found along the lower edge.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetSampleLowerEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
```

```
void GetSampleLowerEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleLowerEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

ERectangleGauge.GetSampleRightEdge

Allows to retrieve information on the samples found along the rightmost edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleRightEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleRightEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleRightEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

ERectangleGauge.GetSampleUpperEdge

Allows to retrieve information on the samples found along the upper edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleUpperEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleUpperEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleUpperEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

ERectangleGauge.GetSampleX

This method is deprecated.

Allows to retrieve information on the samples found along the X edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleX(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleX(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleX(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use ERectangleGauge::GetSampleRightEdge instead.

ERectangleGauge.GetSampleX

This method is deprecated.

Allows to retrieve information on the samples found along the X edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleX(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
```

```
void GetSampleX(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleX(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use ERectangleGauge::GetSampleRightEdge instead.

ERectangleGauge.GetSampleY

This method is deprecated.

Allows to retrieve information on the samples found along the Y edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleY(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleY(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleY(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use ERectangleGauge::GetSampleUpperEdge instead.

ERectangleGauge.GetSampleY

This method is deprecated.

Allows to retrieve information on the samples found along the Y edge.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetSampleY(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSampleY(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )
bool GetSampleY(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use ERectangleGauge::GetSampleUpperEdge instead.

ERectangleGauge.GetSkipRange

Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the ERectangleGauge::AddSkipRange method.

Namespace: Euresys.Open_eVision

```
[C#]
void GetSkipRange(
 uint index,
 out uint start,
 out uint end
 )
```

Parameters

index

Index of the skip range.

start

Beginning of the skip range.

end

End of the skip range.

Remarks

Start is guaranteed to be smaller or equal to end.

ERectangleGauge.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the daughters gauges handles have to be considered as well.

ERectangleGauge.HVConstraint

Status of the restriction on the orientation of the point location gauge or model fitting sample paths.

Namespace: Euresys.Open_eVision

[C#]

```
bool HVConstraint
  { get; set; }
```

Remarks

Sample paths are the point location gauges placed along the model to be fitted.

ERectangleGauge.InnerFilteringEnabled

Getter method for the GetInnerFilteringEnabled property. This property is the flag indicating if the inner sampled point filtering is enabled (true).

Namespace: Euresys.Open_eVision

[C#]

```
bool InnerFilteringEnabled
  { get; }
```

Remarks

The inner sampled point filtering is activated as soon as the corresponding threshold is set, getting the ERectangleGauge.InnerFilteringThreshold property. To disable inner filtering, use the DisableInnerFiltering method.

ERectangleGauge.InnerFilteringThreshold

Sampled point inner filtering threshold.

Namespace: Euresys.Open_eVision

[C#]

```
float InnerFilteringThreshold
  { get; set; }
```

Remarks

If inner filtering is enabled, the sampled points that have been found inside the measured rectangle are filtered in regard of their distance to it. If this distance is greater than the threshold, the sampled point is set as invalid, and removed from the measure. This distance is in physical units.
The inner sampled point filtering is activated as soon as the corresponding threshold is set. To disable inner filtering, use the DisableInnerFiltering method.

ERectangleGauge.KnownAngle

Flag indicating whether the rotation angle of the rectangle to be fitted is known or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool KnownAngle
  { get; set; }
```

Remarks

A rectangle model to be fitted may have a well-known orientation. It is possible to impose the value of this rotation angle, thus removing one degree of freedom. The rectangle fitting gauge orientation is set by means of the ERectangleGauge.Angle property.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

ERectangleGauge.Measure

Triggers the point location or the model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Pointer to the source image.

region

Region to use with the source image.

Remarks

When this method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

ERectangleGauge.MeasuredRectangle

Information pertaining to the fitted rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangle MeasuredRectangle
  { get; }
```

Remarks

Use method EShape::GetFound to get the status of the measurement. ERectangleGauge::MeasuredRectangle returns a successful fitted rectangle if EShape::GetFound is true, otherwise it returns the orginal (nominal) rectangle.

ERectangleGauge.MeasureSample

Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint pathIndex
 )
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint pathIndex
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

pathIndex

Sample path index.

region

Region on which to measure.

Remarks

This method stores its results into a temporary variable inside the ERectangleGauge object.

ERectangleGauge.MeasureWithoutFitting

Triggers the point location without rectangle fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Source image.

region

Region on which to measure.

Remarks

This method performs the actual measurement for each transition, but does not perform the rectangle fitting. This means that individual samples will be available for each edges through the ERectangleGauge::GetSamplex (Edge x), ERectangleGauge::GetSampley (Edge y), ERectangleGauge::GetSampleX (Edge X), ERectangleGauge::GetSampleY (Edge Y) methods, but the gauge position will not be changed.
Please note that the filtering will not be performed in this method, since it relies upon the fitting process. The filtering parameters will thus be unused.

ERectangleGauge.MinAmplitude

Offset added to the Threshold when a peak is to be detected.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinAmplitude
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value.
To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected.
When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

ERectangleGauge.MinArea

Minimum area value.

Namespace: Euresys.Open_eVision

```
[C#]
uint MinArea
  { get; set; }
```

Remarks

A transition is detected if its derivative peak reaches Threshold + MinAmplitude value, and then declared valid if the area between the peak curve and the horizontal at level Threshold reaches the MinArea value.

ERectangleGauge.NumFilteringPasses

Number of filtering passes for a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumFilteringPasses
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
During a filtering pass, the points that are too distant from the model are discarded.
During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).
By default (the number of filtering passes is 0), the outliers rejection process is disabled.

ERectangleGauge.NumSamples

Number of sampled points during the model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation.
After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

ERectangleGauge.NumSamplesLeftEdge

Number of sampled points found on leftmost edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesLeftEdge
  { get; }
```

ERectangleGauge.NumSamplesLowerEdge

Number of sampled points found on lower edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesLowerEdge
  { get; }
```

ERectangleGauge.NumSamplesRightEdge

Number of sampled points found on rightmost edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesRightEdge
  { get; }
```

ERectangleGauge.NumSamplesUpperEdge

Number of sampled points found on upper edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesUpperEdge
  { get; }
```

ERectangleGauge.NumSamplesX

This property is deprecated.

Number of sampled points found on edge X during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesX
  { get; }
```

Remarks

Deprecation notice: Use ERectangleGauge instead.

ERectangleGauge.NumSamplesX

This property is deprecated.

Number of sampled points found on edge X during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesX
  { get; }
```

Remarks

Deprecation notice: Use ERectangleGauge instead.

ERectangleGauge.NumSamplesY

This property is deprecated.

Number of sampled points found on edge Y during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesY
  { get; }
```

Remarks

Deprecation notice: Use ERectangleGauge instead.

ERectangleGauge.NumSamplesY

This property is deprecated.

Number of sampled points found on edge Y during the measure operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumSamplesY
  { get; }
```

Remarks

Deprecation notice: Use ERectangleGauge instead.

ERectangleGauge.NumSkipRanges

Number of skip ranges in the gauge after a call to ERectangleGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumSkipRanges
  { get; }
```

ERectangleGauge.NumValidSamples

Number of valid sample points remaining after a model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumValidSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation.
After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

ERectangleGauge.operator=

Copies all the data from another ERectangleGauge object into the current ERectangleGauge object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangleGauge operator=(
 Euresys.Open_eVision.ERectangleGauge other
 )
```

Parameters

other

ERectangleGauge object to be copied

ERectangleGauge.Plot

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void Plot(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.

height
Height of the plot.

originX
Origin point coordinates of the plot along the X axis.

originY
Origin point coordinates of the plot along the Y axis.

color
The color in which to draw the overlay.

Remarks

The sample path that is taken into considered is the one inspected with the last call to ERectangleGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call ERectangleGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERectangleGauge.PlotWithCurrentPen

This method is deprecated.

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

```
[C#]
void PlotWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width

Width of the plot.

height

Height of the plot.

originX

Origin point coordinates of the plot along the X axis.

originY

Origin point coordinates of the plot along the Y axis.

Remarks

The sample path that is taken into considered is the one inspected with the last call to ERectangleGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call ERectangleGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERectangleGauge.Process

Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.

Namespace: Euresys.Open_eVision

```
[C#]
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool daughters
 )
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 bool daughters
 )
```

Parameters

sourceImage

Pointer to the source image.

daughters

Flag indicating whether the daughters shapes inherit of the same behavior.

region

Region to use with the source image.

Remarks

When complex gauging is required, several gauges can be grouped together. Applying Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

ERectangleGauge.RectangularSamplingArea

Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.

Namespace: Euresys.Open_eVision

```
[C#]
bool RectangularSamplingArea
  { get; set; }
```

Remarks

By default, this flag is set to true: the sampling area always remains a rectangle.
Setting this property is only useful when the thickness transition parameter is greater than 1. In fact, when thickness transition parameter is equal to 1, rectangle and parallelogram reduce to the same segment.

ERectangleGauge.RemoveAllSkipRanges

Removes all the skip ranges previously created by a call to ERectangleGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveAllSkipRanges(
 )
```

ERectangleGauge.RemoveSkipRange

After a call to ERectangleGauge::AddSkipRange, removes the skip range with the given index.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveSkipRange(
 uint index
 )
```

Parameters

index

Index of the skip range to remove, as returned by ERectangleGauge::AddSkipRange.

ERectangleGauge.SamplingStep

Approximate distance between sampled points during a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
float SamplingStep
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
To fit a model, a series of point location operations are performed along the model. The point location gauges spacing is given by the sampling step.
By default, the sampling step is set to 5, which means 5 pixels when the field of view is not calibrated, and 5 physical units in case of a calibrated field of view.
Be aware that if the sampling step is too large, the number of sampled points along the model will not be sufficient enough to accurately locate it.

ERectangleGauge.SetMinNumFitSamples

Sets the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void SetMinNumFitSamples(
 int side0,
 int side1,
 int side2,
 int side3
 )
```

Parameters

side0

Minimum number of samples on the *top side* of the rectangle. The default value is 2.

side1

Minimum number of samples on the *left side* of the rectangle. If this value is not specified, it is equal to n32Side0. The default value is 2.

side2

Minimum number of samples on the *bottom side* of the rectangle. If this value is not specified, it is equal to n32Side0. The default value is 2.

side3

Minimum number of samples on the *right side* of the rectangle. If this value is not specified, it is equal to n32Side1. The default value is 2.

Remarks

When the ERectangleGauge::Measure method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

ERectangleGauge.Smoothing

Number of pixels used for the low-pass filtering operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint Smoothing
  { get; set; }
```

Remarks

To reduce the effect of noise, the profile data can be low-pass filtered along the point location gauge direction.

ERectangleGauge.Thickness

Number of parallel segments used to extract the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Thickness
  { get; set; }
```

Remarks

To reduce the effect of noise and/or strengthen a transition, several parallel profiles can be accumulated.

ERectangleGauge.Threshold

Threshold level used to delimit significant peaks in the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Threshold
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value.
To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected.
When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

ERectangleGauge.Tolerance

Searching area half thickness of the rectangle fitting gauge.

Namespace: Euresys.Open_eVision

[C#]

```
float Tolerance
  { get; set; }
```

Remarks

A rectangle fitting gauge is fully defined knowing its nominal position (its center coordinates), its nominal size, its rotation angle, and its outline tolerance.
By default, the searching area thickness of the rectangle fitting gauge is 20 (2x10), which means 20 pixels when the field of view is not calibrated, and 20 physical units in case of a calibrated field of view.

ERectangleGauge.TransitionChoice

Transition choice.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ETransitionChoice TransitionChoice
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition.
In case of NthFromBegin or NthFromEnd transition choice, set ERectangleGauge::TransitionIndex to specify the desired transition.
By default, the selected transition corresponds to the one with the largest amplitude (LargestAmplitude).

ERectangleGauge.TransitionIndex

Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.

Namespace: Euresys.Open_eVision

[C#]

```
uint TransitionIndex
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition.
By default, the first transition is retained (the index value is 0).

ERectangleGauge.TransitionType

Transition type.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ETransitionType TransitionType
  { get; set; }
```

Remarks

The type of a transition tells whether it crosses increasing or decreasing gray-level values. This helps discriminate between nearby edges of an object.
By default, the searched transition type is indifferently a black to white or a white to black transition (BwOrWb).

ERectangleGauge.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

ERectangleGauge.Valid

Flag indicating if at least one valid transition has been found.

Namespace: Euresys.Open_eVision

```
[C#]
bool Valid
  { get; }
```

Remarks

A false value means that no measurement has been performed.
A true value means that a transition was found along the sample path inspected with the last call to ERectangleGauge::MeasureSample, and thus a point has been measured.

4.211. ERectangleRegion Class

Manages a complete context for an ERegion shaped like a rectangle.

Base Class:ERegion

Namespace: Euresys.Open_eVision

Properties

Angle	Angle of the region
Center	Center of the region
Corners	Corners of the region
Height	Height of the region
Width	Width of the region

Methods

Drag	Moves the specified handle to a new position and updates all placement parameters of the region.
ERectangleRegion	Constructs an ERectangleRegion context.
HitTest	Detects if the cursor is placed over one of the dragging handles.
Load	Loads the ERectangleRegion. The given ESerializer must have been created for reading.
operator!=	Checks if this ERectangleRegion instance is not strictly equal to another
operator=	Assignment operator.
operator==	Checks if this ERectangleRegion instance is strictly equal to another
Rotate	Creates a new ERectangleRegion by rotating the ERectangleRegion around its center.
Save	Saves the ERectangleRegion. The given ESerializer must have been created for writing.
Scale	Creates a new ERectangleRegion by scaling the ERectangleRegion. The center of the ERectangleRegion remains at the same place.
Translate	Creates a new ERectangleRegion by translating the ERectangleRegion.

ERectangleRegion.Angle

Angle of the region

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

ERectangleRegion.Center

Center of the region

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

ERectangleRegion.Corners

Corners of the region

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint[] Corners
  { get; }
```

ERectangleRegion.Drag

Moves the specified handle to a new position and updates all placement parameters of the region.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with ERectangleRegion::HitTest and ERectangleRegion::Drag.

ERectangleRegion.ERectangleRegion

Constructs an ERectangleRegion context.

Namespace: Euresys.Open_eVision

[C#]

```
void ERectangleRegion(
 )

void ERectangleRegion(
 float originX,
 float originY,
 float width,
 float height
 )

void ERectangleRegion(
 Euresys.Open_eVision.EPoint origin,
 float width,
 float height
 )

void ERectangleRegion(
 float centerX,
 float centerY,
 float width,
 float height,
 float angle
 )
```

```
void ERectangleRegion(
 Euresys.Open_eVision.EPoint center,
 float width,
 float height,
 float angle
 )
void ERectangleRegion(
 Euresys.Open_eVision.ERectangle rectangle
 )
void ERectangleRegion(
 Euresys.Open_eVision.ERectangleRegion other
 )
```

Parameters

originX
The abcissa of the ERectangleRegion's top left corner.

originY
The ordinate of the ERectangleRegion's top left corner.

width
The width of the ERectangleRegion.

height
The height of the ERectangleRegion.

origin
The top left corner of the ERectangleRegion.

centerX
The abcissa of the ERectangleRegion center.

centerY
The ordinate of the ERectangleRegion center.

angle
The angle of the ERectangleRegion.

center
The center of the ERectangleRegion.

rectangle
The result of an ERectangleGauge object.

other
ERectangleRegion context to copy.

Remarks

A ERectangleRegion aligned with the image axes is defined from the top left corner. Otherwise, an oriented ERectangleRegion is defined from its center point.

ERectangleRegion.Height

Height of the region

Namespace: Euresys.Open_eVision

[C#]

```
float Height
  { get; set; }
```

ERectangleRegion.HitTest

Detects if the cursor is placed over one of the dragging handles.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EEditionMode HitTest(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x
x-coordinate of the mouse cursor.

y
y-coordinate of the mouse cursor.

zoomX
Horizontal zoom factor. By default, true scale is used.

zoomY
Vertical zoom factor. By default, true scale is used.

panX
Horizontal pan offset. By default, no pan is added.

panY
Vertical pan offset. By default, no pan is added.

Remarks

Returns a handle identifier, as defined by EEditionMode.
If zooming and/or panning were used when drawing the region, the same values must be used with ERectangleRegion::HitTest and ERectangleRegion::Drag.

ERectangleRegion.Load

Loads the ERectangleRegion. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ERectangleRegion.operator!=

Checks if this ERectangleRegion instance is not strictly equal to another

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.ERectangleRegion other
 )
```

Parameters

other

Reference to the other ERectangleRegion instance

ERectangleRegion.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangleRegion operator=(
 Euresys.Open_eVision.ERectangleRegion other
 )
```

Parameters

other

Reference to the ERectangleRegion used for the assignment

ERectangleRegion.operator==

Checks if this ERectangleRegion instance is strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ERectangleRegion other
 )
```

Parameters

other

Reference to the other ERectangleRegion instance

ERectangleRegion.Rotate

Creates a new ERectangleRegion by rotating the ERectangleRegion around its center.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERectangleRegion Rotate(
 float angle
 )
```

Parameters

angle

rotation angle

ERectangleRegion.Save

Saves the ERectangleRegion. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

ERectangleRegion.Scale

Creates a new ERectangleRegion by scaling the ERectangleRegion. The center of the ERectangleRegion remains at the same place.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangleRegion Scale(
 float scale
 )

Euresys.Open_eVision.ERectangleRegion Scale(
 float scaleX,
 float scaleY
 )
```

Parameters

scale
Isotropic scale

scaleX
Horizontal scale

scaleY
Vertical scale

ERectangleRegion.Translate

Creates a new ERectangleRegion by translating the ERectangleRegion.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangleRegion Translate(
 float dx,
 float dy
 )
```

Parameters

dx

Horizontal translation in pixel value

dy

Vertical translation in pixel value

ERectangleRegion.Width

Width of the region

Namespace: Euresys.Open_eVision

[C#]

```
float Width
  { get; set; }
```

4.212. ERectangleShape Class

Manages a rectangle shape.

Base Class:EShape
Derived Class(es):ERectangleGauge
Namespace: Euresys.Open_eVision

Properties

Angle	Orientation of the shape.
Center	Center point of the shape.
CenterX	Abscissa of the origin point of the shape.
CenterY	Ordinate of the origin point of the shape.
Rectangle	Sets the parameters of the rectangle according to a known ERectangle object.
Scale	Horizontal sensor resolution, in pixels per unit.
SizeX	X size of the ERectangleShape
SizeY	Y size of the ERectangleShape
Type	Shape type.

Methods

Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

CopyTo	Copies all the data of the current ERectangleShape object into another ERectangleShape object and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the shape.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
GetCorners	Retrieves the coordinates of each corner of a ERectangleShape object.
GetEdges	Retrieves each edge of a ERectangleShape object.
GetMidEdges	Retrieves the center coordinates of each edge of a ERectangleShape object.
GetPoint	Returns the coordinates of a particular point, specified by its location in the ERectangleShape area.
HitTest	Checks if there is a handle under the cursor.
operator=	Copies all the data from another ERectangleShape object into the current ERectangleShape object
SetCenterXY	Sets the center coordinates of a ERectangleShape object.
SetFromOppositeCorners	Sets the geometric parameters of an ERectangleShape object using two opposed corners.
SetFromOriginMiddleEnd	DEPRECATED (you should use ERectangleShape::SetFromThreeCorners): Sets the geometric parameters of an ERectangleShape object using three corners.
SetFromThreeCorners	Sets the geometric parameters of an ERectangleShape object using three corners.
SetFromTwoPoints	DEPRECATED (you should use ERectangleShape::SetFromOppositeCorners): Sets the geometric parameters of an ERectangleShape object using two opposed corners.
SetSize	Sets the size of a ERectangleShape object.

ERectangleShape.Angle

Orientation of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

ERectangleShape.Center

Center point of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

ERectangleShape.CenterX

Abscissa of the origin point of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

ERectangleShape.CenterY

Ordinate of the origin point of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

ERectangleShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

[C#]

```
void Closest(
 )
```

ERectangleShape.CopyTo

Copies all the data of the current ERectangleShape object into another ERectangleShape object and returns it.

Namespace: Euresys.Open_eVision

```
[C#]

void CopyTo(
 Euresys.Open_eVision.ERectangleShape dest,
 bool bRecursive
 )

Euresys.Open_eVision.ERectangleShape CopyTo(
 Euresys.Open_eVision.ERectangleShape dest,
 bool bRecursive
 )
```

Parameters

dest

Pointer to the ERectangleShape object in which the current ERectangleShape object data have to be copied.

bRecursive

true if the children shapes have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new ERectangleShape object will be created and returned.

ERectangleShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

```
[C#]

void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

ERectangleShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERectangleShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERectangleShape.GetCorners

Retrieves the coordinates of each corner of a ERectangleShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void GetCorners(
 Euresys.Open_eVision.EPoint xy,
 Euresys.Open_eVision.EPoint XXy,
 Euresys.Open_eVision.EPoint xYY,
 Euresys.Open_eVision.EPoint XXYY
 )
```

Parameters

xy

Coordinates of the lower leftmost corner of the ERectangleShape object.

XXy

Coordinates of the lower rightmost corner of the ERectangleShape object.

xYY

Coordinates of the upper leftmost corner of the ERectangleShape object.

XXYY

Coordinates of the upper rightmost corner of the ERectangleShape object.

ERectangleShape.GetEdges

Retrieves each edge of a ERectangleShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void GetEdges(
 Euresys.Open_eVision.ELine x,
 Euresys.Open_eVision.ELine XX,
 Euresys.Open_eVision.ELine y,
 Euresys.Open_eVision.ELine YY
 )
```

Parameters

x
Leftmost edge of the ERectangleShape object.

XX
Rightmost edge of the ERectangleShape object.

y
Lower edge of the ERectangleShape object.

YY
Upper edge of the ERectangleShape object.

ERectangleShape.GetMidEdges

Retrieves the center coordinates of each edge of a ERectangleShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void GetMidEdges(
 Euresys.Open_eVision.EPoint x,
 Euresys.Open_eVision.EPoint XX,
 Euresys.Open_eVision.EPoint y,
 Euresys.Open_eVision.EPoint YY
 )
```

Parameters

x
Center coordinates of the leftmost edge of the ERectangleShape object.

XX
Center coordinates of the rightmost edge of the ERectangleShape object.

y
Center coordinates of the lower edge of the ERectangleShape object.

YY
Center coordinates of the upper edge of the ERectangleShape object.

ERectangleShape.GetPoint

Returns the coordinates of a particular point, specified by its location in the ERectangleShape area.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 float fractionX,
 float fractionY
 )
```

Parameters

fractionX

Point location expressed as a fraction of the ERectangleShape vertical edges (range -1, +1).

fractionY

Point location expressed as a fraction of the ERectangleShape horizontal edges (range -1, +1).

ERectangleShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

ERectangleShape.operator=

Copies all the data from another ERectangleShape object into the current ERectangleShape object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERectangleShape operator=(
 Euresys.Open_eVision.ERectangleShape other
 )
```

Parameters

other

ERectangleShape object to be copied

ERectangleShape.Rectangle

Sets the parameters of the rectangle according to a known ERectangle object.

Namespace: Euresys.Open_eVision

```
[C#]
virtual Euresys.Open_eVision.ERectangle Rectangle
  { get; set; }
```

ERectangleShape.Scale

Horizontal sensor resolution, in pixels per unit.

Namespace: Euresys.Open_eVision

```
[C#]
float Scale
  { get; set; }
```

ERectangleShape.SetCenterXY

Sets the center coordinates of a ERectangleShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the ERectangleShape object.

centerY

Center coordinates of the ERectangleShape object.

ERectangleShape.SetFromOppositeCorners

Sets the geometric parameters of an ERectangleShape object using two opposed corners.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOppositeCorners(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the rectangle.

end

End point coordinates of the rectangle.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

ERectangleShape.SetFromOriginMiddleEnd

This method is deprecated.

DEPRECATED (you should use ERectangleShape::SetFromThreeCorners): Sets the geometric parameters of an ERectangleShape object using three corners.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the rectangle.

middle

Middle point coordinates of the rectangle.

end

End point coordinates of the rectangle.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

ERectangleShape.SetFromThreeCorners

Sets the geometric parameters of an ERectangleShape object using three corners.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromThreeCorners(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the rectangle.

middle

Middle point coordinates of the rectangle.

end

End point coordinates of the rectangle.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

ERectangleShape.SetFromTwoPoints

This method is deprecated.

DEPRECATED (you should use ERectangleShape::SetFromOppositeCorners): Sets the geometric parameters of an ERectangleShape object using two opposed corners.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint end
 )
```

Parameters

origin

Origin point coordinates of the rectangle.

end

End point coordinates of the rectangle.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

ERectangleShape.SetSize

Sets the size of a ERectangleShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSize(
 float sizeX,
 float sizeY
 )
```

Parameters

sizeX

Nominal size X of the ERectangleShape object. Default values is 100.

sizeY

Nominal size Y of the ERectangleShape object. Default values is 100.

Remarks

A ERectangleShape object is fully defined knowing its nominal position (given by the coordinates of its center), its nominal size, its rotation angle and its outline tolerance. By default, the width and height values are 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

ERectangleShape.SizeX

X size of the ERectangleShape

Namespace: Euresys.Open_eVision

[C#]

```
float SizeX
  { get; }
```

ERectangleShape.SizeY

Y size of the ERectangleShape

Namespace: Euresys.Open_eVision

```
[C#]
float SizeY
  { get; }
```

ERectangleShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

4.213. ERectangularCropper Class

Manages a point cloud cropper in the shape of a rectangular parallelepiped.

Namespace: Euresys.Open_eVision.Easy3D

Methods

Crop	Crops a EPointCloud.
ERectangularCropper	Creates an ERectangularCropper object.
operator=	Assignment operator.
operator==	Equality operator.

ERectangularCropper.Crop

Crops a EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Crop(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut,
 bool invertCrop
 )
```

Parameters

cloudIn

Cloud to be cropped.

cloudOut

Cropped cloud.

invertCrop

Indicates if the points kept must be the points inside (true) or outside (false) the rectangular parallelepiped.

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

ERectangularCropper.ERectangularCropper

Creates an ERectangularCropper object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ERectangularCropper(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float xSize,
 float ySize,
 float zSize,
 float roll,
 float pitch,
 float yaw
 )

void ERectangularCropper(
 Euresys.Open_eVision.Easy3D.ERectangularCropper other
 )

void ERectangularCropper(
 Euresys.Open_eVision.Easy3D.E3DBox box
 )
```

Parameters

center
Center of the rectangular parallelepiped.
xSize
Size along the X axis before rotation of the rectangular parallelepiped.
ySize
Size along the Y axis before rotation of the rectangular parallelepiped.
zSize
Size along the Z axis before rotation of the rectangular parallelepiped.
roll
Roll (rotation along the X axis) of the rectangular parallelepiped.
pitch
Pitch (rotation along the Y axis) of the rectangular parallelepiped.
yaw
Yaw (rotation along the Z axis) of the rectangular parallelepiped.
other
Reference ERectangularCropper used for the initialization.
box
E3DBox used to delimit the zone the cropper will crop or keep.

ERectangularCropper.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.ERectangularCropper operator=(
 Euresys.Open_eVision.Easy3D.ERectangularCropper other
 )
```

Parameters

other
An other ERectangularCropper.

ERectangularCropper.operator==

Equality operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator==(
 Euresys.Open_eVision.Easy3D.ERectangularCropper other
 )
```

Parameters

other

An other ERectangularCropper.

4.214. EReferenceImageSegmenter Class

Segments an image using a pixel-by-pixel single threshold given as an image.

Remarks

This segmenter is applicable to EROIBW8, EROIBW16 and EROIC24 images. It produces coded images with two layers. The threshold is defined for each pixel individually by means of a reference image of the same type as the source image.

For grayscales images, the White layer (usually, with index 1) contains unmasked pixels having a gray value in a range defined by the gray value of the respective pixel in the reference image and the white color.

For RGB color images, the White layer (usually, with index 1) contains unmasked pixels having a color inside the cube of the RGB color space defined by the color of the respective pixel in the reference image and the white color (255,255,255).

The Black layer (usually, with index 0) contains the remaining unmasked pixels.

Base Class:ETwoLayersImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

BlackLayerEncoded	Black layer encoding status.
BlackLayerIndex	Index of the black layer in the destination coded image.
ReferenceImageBW16	Reference image for the segmentation of EROIBW16 images.
ReferenceImageBW8	Reference image for the segmentation of EROIBW8 images.
ReferenceImageC24	Reference image for the segmentation of EROIC24 images.
WhiteLayerEncoded	White layer encoding status.
WhiteLayerIndex	Index of the white layer in the destination coded image.

Methods

Load	Load the EReferenceImageSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the EReferenceImageSegmenter configuration. The given ESerializer must have been created for writing.

EReferenceImageSegmenter.BlackLayerEncoded

Black layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
override bool BlackLayerEncoded
  { get; set; }
```

EReferenceImageSegmenter.BlackLayerIndex

Index of the black layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
override uint BlackLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the black layer.

EReferenceImageSegmenter.Load

Load the EReferenceImageSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EReferenceImageSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
bool operator==(
 Euresys.Open_eVision.Segmenters.EReferenceImageSegmenter other
 )
```

Parameters

other

Other segmenter to compare to.

EReferenceImageSegmenter.ReferenceImageBW16

Reference image for the segmentation of EROIBW16 images.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
Euresys.Open_eVision.EROIBW16 ReferenceImageBW16
  { get; set; }
```

Remarks

Note that the image is copied internally.

EReferenceImageSegmenter.ReferenceImageBW8

Reference image for the segmentation of EROIBW8 images.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
Euresys.Open_eVision.EROIBW8 ReferenceImageBW8
  { get; set; }
```

Remarks

Note that the image is copied internally.

EReferenceImageSegmenter.ReferenceImageC24

Reference image for the segmentation of EROIC24 images.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
Euresys.Open_eVision.EROIC24 ReferenceImageC24
  { get; set; }
```

Remarks

Note that the image is copied internally.

EReferenceImageSegmenter.Save

Save the EReferenceImageSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EReferenceImageSegmenter.WhiteLayerEncoded

White layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
override bool WhiteLayerEncoded
  { get; set; }
```

EReferenceImageSegmenter.WhiteLayerIndex

Index of the white layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
override uint WhiteLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the white layer.

4.215. ERegion Class

Manages a complete context for a ERegion (Abritrary Shaped ROI)

Derived Class(es):ECircleRegionEEllipseRegionEPolygonRegionERectangleRegion
Namespace: Euresys.Open_eVision

Properties

Area	Area of the ERegion.
BoundingBoxHeight	Bounding box height.
BoundingBoxOrgX	Bounding box origin abscissa.
BoundingBoxOrgY	Bounding box origin ordinate.
BoundingBoxWidth	Bounding box width.
EditionMode	Graphical edition mode
Runs	Runs of the region

Methods

Contour	Creates a new ERegion containing the contour of the ERegion.
CropRuns	Creates a new ERegion by cropping the ERegion runs within a given area.
Drag	Moves the specified handle to a new position and updates all placement parameters of the region.
Draw	Draws the ERegion shape.
DrawContour	Draws the ERegion contour.
DrawContourWithCurrentPen	Draws the ERegion contour with the current pen.
DrawHandles	Draws the region handles.
DrawHandlesWithCurrentPen	Draws the region handles with the current pen.
DrawWithCurrentPen	Draws the ERegion area.
ERegion	Constructs an ERegion context.

Grow	Creates a new ERegion by growing the ERegion runs with a dilation using a circular structuring element.
HitTest	Detects if the cursor is placed over one of the dragging handles.
Intersection	Creates a new ERegion by intersecting two ERegion.
IsPointInRegion	Checks if a point is inside the region
Load	Loads the ERegion. The given ESerializer must have been created for reading.
operator!=	Checks if this ERegion instance is not strictly equal to another (order of the runs included)
operator=	Assignment operator.
operator==	Checks if this ERegion instance is strictly equal to another (order of the runs included)
Prepare	Computes the values necessary for the ERegion to be used during processing.
Save	Saves the ERegion. The given ESerializer must have been created for writing.
Shrink	Creates a new ERegion by shrinking the ERegion runs with an erosion using a circular structuring element.
Subtraction	Creates a new ERegion by substracting one ERegion from another.
ToImage	Exports the ERegion to a mask-type image.
TranslateRuns	Creates a new ERegion by translating the region runs.
Union	Creates a new ERegion by combining two ERegion.

ERegion.Area

Area of the ERegion.

Namespace: Euresys.Open_eVision

```
[C#]
virtual int Area
  { get; }
```

Remarks

The number of pixels of the ERegion

ERegion.BoundingBoxHeight

Bounding box height.

Namespace: Euresys.Open_eVision

[C#]

```
virtual int BoundingBoxHeight
  { get; }
```

Remarks

The height is the height of the upright rectangle encompassing the ERun.

ERegion.BoundingBoxOrgX

Bounding box origin abscissa.

Namespace: Euresys.Open_eVision

[C#]

```
virtual int BoundingBoxOrgX
  { get; }
```

Remarks

The origin is the top left corner of the upright rectangle encompassing the ERun.

ERegion.BoundingBoxOrgY

Bounding box origin ordinate.

Namespace: Euresys.Open_eVision

[C#]

```
virtual int BoundingBoxOrgY
  { get; }
```

Remarks

The origin is the top left corner of the upright rectangle encompassing the ERun.

ERegion.BoundingBoxWidth

Bounding box width.

Namespace: Euresys.Open_eVision

[C#]

```
virtual int BoundingBoxWidth
  { get; }
```

Remarks

The width is the width of the upright rectangle encompassing the ERun.

ERegion.Contour

Creates a new ERegion containing the contour of the ERegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Contour(
 int thickness,
 bool centered
 )
```

Parameters

thickness

The thickness of the returned contour of the ERegion border. A negative value will compute the inner contour and a positive one will compute the outer contour using the absolute value of thickness as thickness.

centered

If true, the contour will be centered with the border of the ERegion. If false, the contour will be either the inner or outer one depending on the sign of thickness

Remarks

If thickness is even and centered is true, the thickness will be increased by 1.

ERegion.CropRuns

Creates a new ERegion by cropping the ERegion runs within a given area.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion CropRuns(
 int orgX,
 int orgY,
 int width,
 int height
 )
```

Parameters

orgX

X origin of the cropping area.

orgY

Y origin of the cropping area.

width

Width of the cropping area.

height

Height of the cropping area.

ERegion.Drag

Moves the specified handle to a new position and updates all placement parameters of the region.

Namespace: Euresys.Open_eVision

```
[C#]
void Drag(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

If zooming and/or panning were used when drawing the region, the same values must be used with ERegion::HitTest and ERegion::Drag.

ERegion.Draw

Draws the ERegion shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.ERGBColor color,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the ERegion.

opacity

Opacity of the drawn area (range: 0.0 to 1.0).

graphicContext

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegion.DrawContour

Draws the ERegion contour.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawContour(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawContour(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawContour(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawContour(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

A pointer to an EDrawAdapter (like the EWindowsDrawAdapter).

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the ERegion.

graphicContext

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegion.DrawContourWithCurrentPen

This method is deprecated.

Draws the ERegion contour with the current pen.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawContourWithCurrentPen(
 IntPtr hdc,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hdc

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegion.DrawHandles

Draws the region handles.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawHandles(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHandles(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHandles(
 IntPtr hdc,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawHandles(
 IntPtr hdc,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the region.

hdc

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegion.DrawHandlesWithCurrentPen

This method is deprecated.

Draws the region handles with the current pen.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawHandlesWithCurrentPen(
 IntPtr hdc,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

hdc

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegion.DrawWithCurrentPen

This method is deprecated.

Draws the ERegion area.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

opacity

Opacity of the drawn area (range: 0.0 to 1.0).

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegion.EditionMode

Graphical edition mode

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EEditionMode EditionMode
  { get; set; }
```

ERegion.ERegion

Constructs an ERegion context.

Namespace: Euresys.Open_eVision

[C#]

```
void ERegion(
 )

void ERegion(
 Euresys.Open_eVision.ERegion other
 )

void ERegion(
 Euresys.Open_eVision.EROIBW8 roi,
 Euresys.Open_eVision.EBW8 threshold
 )

void ERegion(
 Euresys.Open_eVision.EROIBW16 roi,
 Euresys.Open_eVision.EBW16 threshold
 )

void ERegion(
 Euresys.Open_eVision.ERun[] runs
 )
```

Parameters

other
ERegion context to copy.

roi
Mask ROI.

threshold
Mask Threshold (a pixel belongs to the ERegion if its value is >= threshold).

runs
List of ERun.

ERegion.Grow

Creates a new ERegion by growing the ERegion runs with a dilation using a circular structuring element.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Grow(
 int radius
 )
```

Parameters

radius

-

ERegion.HitTest

Detects if the cursor is placed over one of the dragging handles.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EEditionMode HitTest(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

x-coordinate of the mouse cursor.

y

y-coordinate of the mouse cursor.

zoomX

Horizontal zoom factor. By default, true scale is used.

zoomY

Vertical zoom factor. By default, true scale is used.

panX

Horizontal pan offset. By default, no pan is added.

panY

Vertical pan offset. By default, no pan is added.

Remarks

Returns a handle identifier, as defined by EEditionMode.
If zooming and/or panning were used when drawing the region, the same values must be used with ERegion::HitTest and ERegion::Drag.

ERegion.Intersection

Creates a new ERegion by intersecting two ERegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Intersection(
 Euresys.Open_eVision.ERegion region1,
 Euresys.Open_eVision.ERegion region2
 )
```

Parameters

region1
First region.

region2
Second region.

ERegion.IsPointInRegion

Checks if a point is inside the region

Namespace: Euresys.Open_eVision

```
[C#]
bool IsPointInRegion(
 Euresys.Open_eVision.EPoint point
 )
```

Parameters

point
The point to check.

Remarks

The region must have been prepared before calling this method.

ERegion.Load

Loads the ERegion. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ERegion.operator!=

Checks if this ERegion instance is not strictly equal to another (order of the runs included)

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.ERegion other
 )
```

Parameters

other

Reference to the other ERegion instance

ERegion.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERegion operator=(
 Euresys.Open_eVision.ERegion other
 )
```

Parameters

other

Reference to the ERegion used for the assignment.

ERegion.operator==

Checks if this ERegion instance is strictly equal to another (order of the runs included)

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ERegion other
 )
```

Parameters

other

Reference to the other ERegion instance

ERegion.Prepare

Computes the values necessary for the ERegion to be used during processing.

Namespace: Euresys.Open_eVision

```
[C#]
void Prepare(
 Euresys.Open_eVision.EROIBW8 roi
 )

void Prepare(
 Euresys.Open_eVision.EROIBW16 roi
 )

void Prepare(
 Euresys.Open_eVision.EROIBW32 roi
 )

void Prepare(
 Euresys.Open_eVision.EROIBW32f roi
 )

void Prepare(
 Euresys.Open_eVision.EROIC24 roi
 )

void Prepare(
 Euresys.Open_eVision.EROIC24A roi
 )

void Prepare(
 Euresys.Open_eVision.EROIC15 roi
 )

void Prepare(
 Euresys.Open_eVision.EROIC16 roi
 )
```

```
void Prepare(
 Euresys.Open_eVision.EROIC48 roi
 )
void Prepare(
 int width,
 int height
 )
void Prepare(
 int orgX,
 int orgY,
 int width,
 int height
 )
```

Parameters

roi
Destination or source EBaseROI.

width
Width of the source or destination context.

height
Height of the source or destination context.

orgX
X-Axis origin of the source or destination context.

orgY
Y-Axis origin of the source or destination context.

Remarks

This method should be called once after the ERegion has been parameterized and before the ERegion is used.
If necessary,it will be done automatically before any usage but it will increase the processing time.

ERegion.Runs

Runs of the region

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERun[] Runs
  { get; set; }
```

ERegion.Save

Saves the ERegion. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

ERegion.Shrink

Creates a new ERegion by shrinking the ERegion runs with an erosion using a circular structuring element.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Shrink(
 int radius
 )
```

Parameters

radius

-

ERegion.Subtraction

Creates a new ERegion by substracting one ERegion from another.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Subtraction(
 Euresys.Open_eVision.ERegion region1,
 Euresys.Open_eVision.ERegion region2
 )
```

Parameters

region1
Original region.

region2
Region to substract.

ERegion.ToImage

Exports the ERegion to a mask-type image.

Namespace: Euresys.Open_eVision

```
[C#]
void ToImage(
 Euresys.Open_eVision.EImageC24 img,
 Euresys.Open_eVision.EC24 background,
 Euresys.Open_eVision.EC24 foreground
 )
void ToImage(
 Euresys.Open_eVision.EImageC24A img,
 Euresys.Open_eVision.EC24A background,
 Euresys.Open_eVision.EC24A foreground
 )
void ToImage(
 Euresys.Open_eVision.EImageBW8 img,
 Euresys.Open_eVision.EBW8 background,
 Euresys.Open_eVision.EBW8 foreground
 )
void ToImage(
 Euresys.Open_eVision.EImageBW16 img,
 Euresys.Open_eVision.EBW16 background,
 Euresys.Open_eVision.EBW16 foreground
 )
```

Parameters

img
Destination image.

background
Background color.

foreground
Foreground color.

ERegion.TranslateRuns

Creates a new ERegion by translating the region runs.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion TranslateRuns(
 int dx,
 int dy
 )
```

Parameters

dx
x component of the translation vector.

dy
y component of the translation vector.

ERegion.Union

Creates a new ERegion by combining two ERegion.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Union(
 Euresys.Open_eVision.ERegion region1,
 Euresys.Open_eVision.ERegion region2
 )
```

Parameters

region1
First region.

region2
Second region.

4.216. ERegionFreeHandPainter Class

Manages a complete context for a ERegionFreeHandPainter. This class allows to paint a region using a free hand method.

Namespace: Euresys.Open_eVision

Properties

Brush	Sets the brush to use to paint the region.

Methods

ClearCanvas	Clear the canvas.
Draw	Draws the ERegionFreeHandPainter shape.

DrawContour	Draws the ERegionFreeHandPainter contour.
ERegionFreeHandPainter	Constructs an ERegionFreeHandPainter context.
Paint	Paints the region by applying the brush on the canvas at the designed coordinates.
RetrieveRegion	Retrieves the painted region.
SetCanvasSize	Sets the canvas size.

ERegionFreeHandPainter.Brush

Sets the brush to use to paint the region.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion Brush
  { get; set; }
```

Remarks

Any region can be used as a brush. By default, the brush is a 8-pixel radius circle.

ERegionFreeHandPainter.ClearCanvas

Clear the canvas.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearCanvas(
 )
```

Remarks

The canvas is the area on which to paint the region.

ERegionFreeHandPainter.Draw

Draws the ERegionFreeHandPainter shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float opacity,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

opacity
Opacity of the drawn area (range: 0.0 to 1.0).

zoomX
Horizontal zooming factor. By default, true scale is used.

zoomY
Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX
Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the ERegionFreeHandPainter.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegionFreeHandPainter.DrawContour

Draws the ERegionFreeHandPainter contour.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawContour(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawContour(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawContour(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawContour(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

color

The color in which to draw the ERegionFreeHandPainter.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERegionFreeHandPainter.ERegionFreeHandPainter

Constructs an ERegionFreeHandPainter context.

Namespace: Euresys.Open_eVision

```
[C#]
void ERegionFreeHandPainter(
 )
```

ERegionFreeHandPainter.Paint

Paints the region by applying the brush on the canvas at the designed coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void Paint(
 int x,
 int y,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

x

X position on which to apply the brush.

y

Y position on which to apply the brush.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

The canvas is the area on which to paint the region. The center of the brush region bounding box will be applied at the given location. By default, the brush is a 8-pixel radius circle.

ERegionFreeHandPainter.RetrieveRegion

Retrieves the painted region.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion RetrieveRegion(
 )
```

ERegionFreeHandPainter.SetCanvasSize

Sets the canvas size.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCanvasSize(
 int width,
 int height
 )
void SetCanvasSize(
 Euresys.Open_eVision.EBaseROI roi
 )
```

Parameters

width
Width of the canvas.

height
Height of the canvas.

roi
ROI/Image from which the canvas size will be adapted.

Remarks

The canvas is the area on which to paint the region.

4.217. EROIBW1 Class

This class is deprecated.

The EROIBW1 class is used to represent rectangular regions of interest inside BW1 black and white images. See ROIs.

Base Class:EBaseROI
Derived Class(es):EImageBW1
Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIBW1	Constructs a EROIBW1 object.
GetBitIndex	Gets the index of the bit at the given position in the image.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIBW1.EROIBW1

This method is deprecated.

Constructs a EROIBW1 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIBW1(
 )
void EROIBW1(
 Euresys.Open_eVision.EROIBW1 other
 )
```

Parameters

other

-

EROIBW1.FirstSubROI

This property is deprecated.

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW1 FirstSubROI
  { get; }
```

EROIBW1.GetBitIndex

This method is deprecated.

Gets the index of the bit at the given position in the image.

Namespace: Euresys.Open_eVision

```
[C#]
System.UInt64 GetBitIndex(
 int x,
 int y
 )
```

Parameters

x

-

y

-

EROIBW1.GetNextROI

This method is deprecated.

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW1 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIBW1.GetPixel

This method is deprecated.

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW1 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW1 and EROIBW1 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW1.NextSiblingROI

This property is deprecated.

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW1 NextSiblingROI
  { get; }
```

EROIBW1.operator=

This method is deprecated.

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW1 operator=(
 Euresys.Open_eVision.EROIBW1 other
 )
```

Parameters

other

-

EROIBW1.Parent

This property is deprecated.

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW1 Parent
  { get; }
```

EROIBW1.SetPixel

This method is deprecated.

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPixel(
 Euresys.Open_eVision.EBW1 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW1 and EROIBW1 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW1.TopParent

This property is deprecated.

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageBW1 TopParent
  { get; }
```

4.218. EROIBW16 Class

The EROIBW16 class is used to represent rectangular regions of interest inside BW16 gray-level images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageBW16

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIBW16	Constructs a EROIBW16 image.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIBW16.EROIBW16

Constructs a EROIBW16 image.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIBW16(
 )
void EROIBW16(
 Euresys.Open_eVision.EROIBW16 other
 )
```

Parameters

other

-

EROIBW16.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW16 FirstSubROI
  { get; }
```

EROIBW16.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW16 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIBW16.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW16 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW16 and EROIBW16 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW16.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIBW16 NextSiblingROI
  { get; }
```

EROIBW16.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW16 operator=(
 Euresys.Open_eVision.EROIBW16 other
 )
```

Parameters

other

-

EROIBW16.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIBW16 Parent
  { get; }
```

EROIBW16.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPixel(
 Euresys.Open_eVision.EBW16 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW16 and EROIBW16 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW16.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW16 TopParent
  { get; }
```

4.219. EROIBW32 Class

The EROIBW32 class is used to represent rectangular regions of interest inside BW32 gray-level images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageBW32

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIBW32	Constructs the EROIBW32 object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIBW32.EROIBW32

Constructs the EROIBW32 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIBW32(
 )
void EROIBW32(
 Euresys.Open_eVision.EROIBW32 other
 )
```

Parameters

other

-

EROIBW32.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW32 FirstSubROI
  { get; }
```

EROIBW32.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW32 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIBW32.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW32 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW32 and EROIBW32 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW32.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW32 NextSiblingROI
  { get; }
```

EROIBW32.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW32 operator=(
 Euresys.Open_eVision.EROIBW32 other
 )
```

Parameters

other

-

EROIBW32.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW32 Parent
  { get; }
```

EROIBW32.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EBW32 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW32 and EROIBW32 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW32.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW32 TopParent
  { get; }
```

4.220. EROIBW32f Class

The EROIBW32f class is used to represent rectangular regions of interest inside BW32f gray-level images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageBW32f

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

Draw	Draws an ROI/image in a device context.
DrawFrame	Draws a rectangular frame around an image or ROI.
DrawFrameWithCurrentPen	Draws a rectangular frame around an image or ROI.
EROIBW32f	Constructs the EROIBW32f object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
Save	Saves the EROIBW32f object to the given file.
SaveJpeg	As the JPEG format does not work with floating point data, calling this function throws an exception.
SaveJpeg2K	As the JPEG 2000 format does not work with floating point data, calling this function throws an exception.
SavePng	As the PNG format does not work with floating point data, calling this function throws an exception.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIBW32f.Draw

Draws an ROI/image in a device context.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

c24Vector

When supplied, this parameter allows using a LUT that maps from BW8 to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from BW8 to BW8 when drawing.

Remarks

An ROI/image can be drawn (its pixels rendered) using a device context.
The horizontal and vertical zooming factors can be different and must be contained in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.)

EROIBW32f.DrawFrame

Draws a rectangular frame around an image or ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawFrame(
 IntPtr graphicContext,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawFrame(
 IntPtr graphicContext,
 Euresys.Open_eVision.EFramePosition framePosition,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void DrawFrame(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void DrawFrame(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EFramePosition framePosition,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawFrame(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

handles

true if handles are to be drawn.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

framePosition

Positioning of the frame relative to the ROI.

color

Color in which to draw the frame.

Remarks

A frame can be drawn (using a device context) around an image or ROI, possibly with 9 sizing handles.
A suitable default pen is used (see EROIBW32f::DrawFrameWithCurrentPen if you wish to use the pen currently selected into the device context).
Zooming and panning are possible. Please note that panning is applied *before* zooming.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.)

EROIBW32f.DrawFrameWithCurrentPen

Draws a rectangular frame around an image or ROI.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawFrameWithCurrentPen(
 IntPtr graphicContext,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void DrawFrameWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EFramePosition framePosition,
 bool handles,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

handles

true if handles are to be drawn.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in true scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

framePosition

Positioning of the frame relative to the ROI.

Remarks

A frame can be drawn (using a device context) around an image or ROI, possibly with 9 sizing handles.
The current device context pen is used. Zooming and panning are possible. Please note that panning is applied *before* zooming.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.)

EROIBW32f.EROIBW32f

Constructs the EROIBW32f object.

Namespace: Euresys.Open_eVision

[C#]

```
void EROIBW32f(
 )
void EROIBW32f(
 Euresys.Open_eVision.EROIBW32f other
 )
```

Parameters

other

-

EROIBW32f.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIBW32f FirstSubROI
  { get; }
```

EROIBW32f.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW32f GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIBW32f.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW32f GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW32f and EROIBW32f functions.

EROIBW32f.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW32f NextSiblingROI
  { get; }
```

EROIBW32f.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW32f operator=(
 Euresys.Open_eVision.EROIBW32f other
 )
```

Parameters

other

-

EROIBW32f.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIBW32f Parent
  { get; }
```

EROIBW32f.Save

Saves the EROIBW32f object to the given file.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

path

The full path of the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.
For floating point images, only tiff and Euresys proprietary file format are supported.

Remarks

By default (if no format is specified), the file format is determined from the file extension.
If a serializer is used, then the Euresys proprietary file format is used. This format preserves attributes and sub-ROIs.
See Supported Image File Types for details about supported files.
See Image File Access - Save, Load - for details about file format and compatibility.
For floating point images, only tiff and Euresys proprietary file format are supported.

EROIBW32f.SaveJpeg

As the JPEG format does not work with floating point data, calling this function throws an exception.

Namespace: Euresys.Open_eVision

```
[C#]
void SaveJpeg(
 string path,
 int quality
 )
```

Parameters

path

-

quality

-

EROIBW32f.SaveJpeg2K

As the JPEG 2000 format does not work with floating point data, calling this function throws an exception.

Namespace: Euresys.Open_eVision

```
[C#]
void SaveJpeg2K(
 string path,
 int quality
 )
```

Parameters

path

-

quality

-

EROIBW32f.SavePng

As the PNG format does not work with floating point data, calling this function throws an exception.

Namespace: Euresys.Open_eVision

```
[C#]
void SavePng(
 string path,
 int compression
 )
```

Parameters

path

-

compression

-

EROIBW32f.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EBW32f value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW32f and EROIBW32f functions.

EROIBW32f.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW32f TopParent
  { get; }
```

4.221. EROIBW8 Class

The EROIBW8 class is used to represent rectangular regions of interest inside BW8 gray-level images. See ROIs.

Base Class:EBaseROI
Derived Class(es):EImageBW8
Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIBW8	Constructs the EROIBW8 object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIBW8.EROIBW8

Constructs the EROIBW8 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIBW8(
 )

void EROIBW8(
 Euresys.Open_eVision.EROIBW8 other
 )
```

Parameters

other

-

EROIBW8.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW8 FirstSubROI
  { get; }
```

EROIBW8.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW8 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIBW8.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW8 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW8 and EROIBW8 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW8.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW8 NextSiblingROI
  { get; }
```

EROIBW8.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIBW8 operator=(
 Euresys.Open_eVision.EROIBW8 other
 )
```

Parameters

other

-

EROIBW8.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIBW8 Parent
  { get; }
```

EROIBW8.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EBW8 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIBW8 and EROIBW8 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIBW8.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageBW8 TopParent
  { get; }
```

4.222. EROIC15 Class

The EROIC15 class is used to represent rectangular regions of interest inside C15 color images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageC15

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIC15	Constructs the EROIC15 object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIC15.EROIC15

Constructs the EROIC15 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIC15(
 )
void EROIC15(
 Euresys.Open_eVision.EROIC15 other
 )
```

Parameters

other

-

EROIC15.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC15 FirstSubROI
  { get; }
```

EROIC15.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC15 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIC15.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC15 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC15 and EROIC15 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC15.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC15 NextSiblingROI
  { get; }
```

EROIC15.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC15 operator=(
 Euresys.Open_eVision.EROIC15 other
 )
```

Parameters

other

-

EROIC15.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC15 Parent
  { get; }
```

EROIC15.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC15 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC15 and EROIC15 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC15.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC15 TopParent
  { get; }
```

4.223. EROIC16 Class

The EROIC16 class is used to represent rectangular regions of interest inside C16 color images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageC16

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIC16	Constructs the EROIC16 object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIC16.EROIC16

Constructs the EROIC16 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIC16(
 )
void EROIC16(
 Euresys.Open_eVision.EROIC16 other
 )
```

Parameters

other

-

EROIC16.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC16 FirstSubROI
  { get; }
```

EROIC16.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC16 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIC16.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC16 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC16 and EROIC16 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC16.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIC16 NextSiblingROI
  { get; }
```

EROIC16.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIC16 operator=(
 Euresys.Open_eVision.EROIC16 other
 )
```

Parameters

other

-

EROIC16.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIC16 Parent
  { get; }
```

EROIC16.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPixel(
 Euresys.Open_eVision.EC16 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC16 and EROIC16 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC16.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EImageC16 TopParent
  { get; }
```

4.224. EROIC24 Class

The EROIC24 class is used to represent rectangular regions of interest inside C24 color images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageC24

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIC24	Constructs the EROIC24 object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIC24.EROIC24

Constructs the EROIC24 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIC24(
 )
void EROIC24(
 Euresys.Open_eVision.EROIC24 other
 )
```

Parameters

other

-

EROIC24.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC24 FirstSubROI
  { get; }
```

EROIC24.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC24 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIC24.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC24 and EROIC24 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC24.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC24 NextSiblingROI
  { get; }
```

EROIC24.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC24 operator=(
 Euresys.Open_eVision.EROIC24 other
 )
```

Parameters

other

-

EROIC24.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC24 Parent
  { get; }
```

EROIC24.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC24 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC24 and EROIC24 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC24.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC24 TopParent
  { get; }
```

4.225. EROIC24A Class

The EROIC24A class is used to represent rectangular regions of interest inside C24A color images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageC24A

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIC24A	Constructs the EROIC24A object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIC24A.EROIC24A

Constructs the EROIC24A object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIC24A(
 )
void EROIC24A(
 Euresys.Open_eVision.EROIC24A other
 )
```

Parameters

other

-

EROIC24A.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC24A FirstSubROI
  { get; }
```

EROIC24A.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC24A GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIC24A.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24A GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC24A and EROIC24A functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC24A.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

[C#]

```
new Euresys.Open_eVision.EROIC24A NextSiblingROI
  { get; }
```

EROIC24A.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIC24A operator=(
 Euresys.Open_eVision.EROIC24A other
 )
```

Parameters

other

-

EROIC24A.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC24A Parent
  { get; }
```

EROIC24A.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC24A value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC24A and EROIC24A functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC24A.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC24A TopParent
  { get; }
```

4.226. EROIC48 Class

The EROIC48 class is used to represent rectangular regions of interest inside C48 color images. See ROIs.

Base Class:EBaseROI

Derived Class(es):EImageC48

Namespace: Euresys.Open_eVision

Properties

FirstSubROI	See GetFirstSubROI in the derived classes
NextSiblingROI	This method returns the ROI that is the next sibling of this ROI.
Parent	Returns the hierarchical parent of this object.
TopParent	Returns the top parent of this object.

Methods

EROIC48	Constructs the EROIC48 object.
GetNextROI	See GetNextROI in the derived classes
GetPixel	Allows reading a single pixel value in the ROI or image.
operator=	Assignment operator.
SetPixel	Allows writing a single pixel value in the ROI or image.

EROIC48.EROIC48

Constructs the EROIC48 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EROIC48(
 )
void EROIC48(
 Euresys.Open_eVision.EROIC48 other
 )
```

Parameters

other

-

EROIC48.FirstSubROI

See GetFirstSubROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC48 FirstSubROI
  { get; }
```

EROIC48.GetNextROI

See GetNextROI in the derived classes

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC48 GetNextROI(
 Euresys.Open_eVision.EBaseROI startROI
 )
```

Parameters

startROI

-

EROIC48.GetPixel

Allows reading a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC48 GetPixel(
 int x,
 int y
 )
```

Parameters

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC48 and EROIC48 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC48.NextSiblingROI

This method returns the ROI that is the next sibling of this ROI.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC48 NextSiblingROI
  { get; }
```

EROIC48.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EROIC48 operator=(
 Euresys.Open_eVision.EROIC48 other
 )
```

Parameters

other

-

EROIC48.Parent

Returns the hierarchical parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
new Euresys.Open_eVision.EROIC48 Parent
  { get; }
```

EROIC48.SetPixel

Allows writing a single pixel value in the ROI or image.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EC48 value,
 int x,
 int y
 )
```

Parameters

value

value to set the pixel to.

x

Offset of the pixel on the x axis.

y

Offset of the pixel on the y axis.

Remarks

Although coordinates outside of the ROI can be supplied, this function will raise an error condition if the coordinates are outside of the top parent image. It should be noted that calling this function several thousand times can be slow. The recommended way to access pixel content in an image or ROI is to use the EROIC48 and EROIC48 functions. For BW8 images/ROIs, using the C++ API only, it is possible to access pixels data faster through an intermediate object: EBW8PixelAccessor.

EROIC48.TopParent

Returns the top parent of this object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EImageC48 TopParent
  { get; }
```

4.227. ERotatedBoundingBox Class

This class represents a rotated bounding box.

Remarks

The rotated bounding box is a rotated, rectangular surface. Its coordinates are floating-point, which makes this class appropriate to handle sub-pixel surfaces.

Namespace: Euresys.Open_eVision

Properties

Angle	Returns the angle of the bounding box (in the current angle units).
Center	Returns the coordinate of the center of the bounding box.
CenterX	Returns the abscissa of the center of the bounding box.
CenterY	Returns the ordinate of the center of the bounding box.
Height	Returns the height of the bounding box.
MajorAxis	Returns the major axis of the ERotatedBoundingBox as an ELine.
Quadrangle	Returns the coordinates of the four corners of the bounding box.
UpperLeftCorner	Returns the coordinates of the upper left corner of the bounding box (the position with the minimum Y and then minimum X).
Width	Returns the width of the bounding box.

Methods

Draw	Draws the rotated bounding box.
DrawWithCurrentPen	Draws the rotated bounding box.
ERotatedBoundingBox	Constructor of the rotated bounding box.
LocalToGlobalBox	Transforms a (local) rotated bounding box, as another (global) rotated bounding box whose coordinates are defined relatively to the current rotated bounding box.
LocalToGlobalPoint	Transforms a (local) point, as another (global) point whose coordinates are defined relatively to the current rotated bounding box.
operator=	Assignment operator.
operator==	Checks if this ERotatedBoundingBox instance is strictly equal to another.
Rotate	Applies a rotation to the bounding box. The bounding box center is the center of rotation.
Scale	Applies a scale to the size of the bounding box.
Translate	Applies a translation on the center of the bounding box.

ERotatedBoundingBox.Angle

Returns the angle of the bounding box (in the current angle units).

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; }
```

ERotatedBoundingBox.Center

Returns the coordinate of the center of the bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; }
```

ERotatedBoundingBox.CenterX

Returns the abscissa of the center of the bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

ERotatedBoundingBox.CenterY

Returns the ordinate of the center of the bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

ERotatedBoundingBox.Draw

Draws the rotated bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning factor. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the bounding box are drawn.

color

The color in which to draw the overlay.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERotatedBoundingBox.DrawWithCurrentPen

This method is deprecated.

Draws the rotated bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 bool drawDiagonals
 )
```

Parameters

graphicContext

Graphic context on which to draw.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning factor. By default, no panning occurs.

drawDiagonals

Specifies whether or not the diagonals of the bounding box are drawn.

Remarks

Drawing is done in the device context associated to the desired window.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ERotatedBoundingBox.ERotatedBoundingBox

Constructor of the rotated bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
void ERotatedBoundingBox(
 float centerX,
 float centerY,
 float width,
 float height,
 float angle
 )

void ERotatedBoundingBox(
 )

void ERotatedBoundingBox(
 Euresys.Open_eVision.ERotatedBoundingBox other
 )
```

Parameters

centerX
The abscissa of the center of the bounding box.

centerY
The ordinate of the center of the bounding box.

width
The width of the bounding box.

height
The height of the bounding box.

angle
The angle of the bounding box (in the current angle units).

other
-

ERotatedBoundingBox.Height

Returns the height of the bounding box.

Namespace: Euresys.Open_eVision

[C#]

```
float Height
  { get; }
```

ERotatedBoundingBox.LocalToGlobalBox

Transforms a (local) rotated bounding box, as another (global) rotated bounding box whose coordinates are defined relatively to the current rotated bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox LocalToGlobalBox(
 Euresys.Open_eVision.ERotatedBoundingBox localBox
 )
```

Parameters

localBox

-

ERotatedBoundingBox.LocalToGlobalPoint

Transforms a (local) point, as another (global) point whose coordinates are defined relatively to the current rotated bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint LocalToGlobalPoint(
 Euresys.Open_eVision.EPoint localPoint
 )
```

Parameters

localPoint

-

ERotatedBoundingBox.MajorAxis

Returns the major axis of the ERotatedBoundingBox as an ELine.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ELine MajorAxis
  { get; }
```

ERotatedBoundingBox.operator=

Assignment operator.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox operator=(
 Euresys.Open_eVision.ERotatedBoundingBox other
 )
```

Parameters

other

-

ERotatedBoundingBox.operator==

Checks if this ERotatedBoundingBox instance is strictly equal to another.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ERotatedBoundingBox other
 )
```

Parameters

other

Reference to the other ERotatedBoundingBox instance

ERotatedBoundingBox.Quadrangle

Returns the coordinates of the four corners of the bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EQuadrangle Quadrangle
  { get; }
```

ERotatedBoundingBox.Rotate

Applies a rotation to the bounding box. The bounding box center is the center of rotation.

Namespace: Euresys.Open_eVision

```
[C#]
void Rotate(
 float angle
 )
```

Parameters

angle
The rotation angle.

ERotatedBoundingBox.Scale

Applies a scale to the size of the bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
void Scale(
 float scaleWidth,
 float scaleHeight
 )
```

Parameters

scaleWidth
The scale to apply to the width.

scaleHeight
The scale to apply to the height.

ERotatedBoundingBox.Translate

Applies a translation on the center of the bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
void Translate(
 float offsetX,
 float offsetY
 )
```

Parameters

offsetX
The offset along the X-axis.

offsetY
The offset along the Y-axis.

ERotatedBoundingBox.UpperLeftCorner

Returns the coordinates of the upper left corner of the bounding box (the position with the minimum Y and then minimum X).

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint UpperLeftCorner
  { get; }
```

ERotatedBoundingBox.Width

Returns the width of the bounding box.

Namespace: Euresys.Open_eVision

```
[C#]
float Width
  { get; }
```

4.228. ESamplePoint Class

A point sampled by a gauge.

Namespace: Euresys.Open_eVision

Properties

IsOutlier	Outlier status of the sample point
IsValid	Validity of the sample point
Position	Position of the sample point

Methods

ESamplePoint	Constructor
operator=	Copies all the data from another ESamplePoint object into the current ESamplePoint object.

ESamplePoint.ESamplePoint

Constructor

Namespace: Euresys.Open_eVision

```
[C#]
void ESamplePoint(
 )
void ESamplePoint(
 Euresys.Open_eVision.ESamplePoint other
 )
```

Parameters

other

-

ESamplePoint.IsOutlier

Outlier status of the sample point

Namespace: Euresys.Open_eVision

```
[C#]
bool IsOutlier
  { get; }
```

ESamplePoint.IsValid

Validity of the sample point

Namespace: Euresys.Open_eVision

```
[C#]
bool IsValid
  { get; }
```

ESamplePoint.operator=

Copies all the data from another ESamplePoint object into the current ESamplePoint object.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ESamplePoint operator=(
 Euresys.Open_eVision.ESamplePoint other
 )
```

Parameters

other

ESamplePoint object to be copied.

ESamplePoint.Position

Position of the sample point

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Position
  { get; }
```

4.229. EScaleCalibrationModel Class

EScaleCalibrationModel is used to convert depth map 2.5D point to 3D world position, only by applying a scale factor.
That kind of "calibration" does not correct the perspective or distortion present in depth maps.
It is a simple and fast way to get a 3D point cloud by applying a scale to each coordinate axis of the depth map pixels.

Base Class:ECalibrationModel

Namespace: Euresys.Open_eVision.Easy3D

Properties

FactorX	Returns the width of a pixel in metric unit.
FactorY	Returns the distance between 2 profiles (depth map lines) in metric unit.
FactorZ	Returns the scale of the pixel value in metric unit.
Type	Returns the type of calibration model, see ECalibrationType.

Methods

EScaleCalibrationModel	Constructs a EScaleCalibrationModel. By default parameters are initialized to default unit values.
Load	Loads the EScaleCalibrationModel calibration model. The given ESerializer must have been created for reading.
operator=	Assignment operator.
operator==	Comparison operator.
Save	Saves the EScaleCalibrationModel calibration model. The given ESerializer must have been created for writing.

EScaleCalibrationModel.EScaleCalibrationModel

Constructs a EScaleCalibrationModel. By default parameters are initialized to default unit values.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EScaleCalibrationModel(
 )
void EScaleCalibrationModel(
 float factorX,
 float factorY,
 float factorZ
 )
void EScaleCalibrationModel(
 Euresys.Open_eVision.Easy3D.EScaleCalibrationModel other
 )
```

Parameters

factorX
: Width of a pixel in metric unit (factor for X coordinate).

factorY
: Distance between 2 profiles (depth map lines) in metric unit (factor for Y coordinate).

factorZ
: Scale of the pixel value in metric unit (factor for Z coordinate).

other
: Another EScaleCalibrationModel used for the initialization.

EScaleCalibrationModel.FactorX

Returns the width of a pixel in metric unit.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float FactorX
  { get; }
```

EScaleCalibrationModel.FactorY

Returns the distance between 2 profiles (depth map lines) in metric unit.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float FactorY
  { get; }
```

EScaleCalibrationModel.FactorZ

Returns the scale of the pixel value in metric unit.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float FactorZ
  { get; }
```

EScaleCalibrationModel.Load

Loads the EScaleCalibrationModel calibration model. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EScaleCalibrationModel.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EScaleCalibrationModel operator=(
 Euresys.Open_eVision.Easy3D.EScaleCalibrationModel other
 )
```

Parameters

other

Another EScaleCalibrationModel.

EScaleCalibrationModel.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool operator==(
 Euresys.Open_eVision.Easy3D.EScaleCalibrationModel other
 )
```

Parameters

other

Another EScaleCalibrationModel.

EScaleCalibrationModel.Save

Saves the EScaleCalibrationModel calibration model. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EScaleCalibrationModel.Type

Returns the type of calibration model, see ECalibrationType.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.ECalibrationType Type
  { get; }
```

4.230. ESearchParamsType Class

This class is deprecated.

This class is instantiated once in each EMatrixCodeReader and represents the search parameters that are explored when reading a EMatrixCode.

Remarks

This class contains 4 sets of search parameters that are scanned at read time. At EMatrixCodeReader construction time, these sets of values are initialized with all possible values. This means, for instance, that a data matrix code read in a freshly created reader is matched against all possible logical sizes. As a consequence, the default values of these sets are not repeated here. They are assumed to represent every possible search parameters. The ESearchParamsType object needs to be used only if you wish to "override" the learning process.

Namespace: Euresys.Open_eVision

Properties

ContrastCount	The size of the list of EMatrixCodeContrastMode the candidate is matched against at read time.
FamilyCount	The size of the list of EFamily the candidate is matched against at read time.
FlippingCount	The size of the list of EFlipping the candidate is matched against at read time.
LogicalSizeCount	The size of the list of ELogicalSize the candidate is matched against at read time.

Methods

AddContrast	Adds a new contrast mode to the list of EMatrixCodeContrastMode the candidate is matched against at read time.
AddFamily	Adds a new family to the list of EFamily the candidate is matched against at read time.

AddFlipping	Adds a new flipping to the list of EFlipping the candidate is matched against at read time.
AddLogicalSize	Adds a new logical size to the list of ELogicalSize the candidate is matched against at read time.
ClearContrast	Clears the list of contrast modes the candidate is matched against at read time.
ClearFamily	Clears the list of families the candidate is matched against at read time.
ClearFlipping	Clears the list of flippings the candidate is matched against at read time.
ClearLogicalSize	Clears the list of logical sizes the candidate is matched against at read time.
GetContrast	Gets an item in the list of EMatrixCodeContrastMode the candidate is matched against at read time.
GetFamily	Gets an item in the list of EFamily the candidate is matched against at read time.
GetFlipping	Gets an item in the list of EFlipping the candidate is matched against at read time.
GetLogicalSize	Gets an item in the list of ELogicalSize the candidate is matched against at read time.
RemoveContrast	Removes the contrast mode from the list of EMatrixCodeContrastMode the candidate is matched against at read time.
RemoveFamily	Removes the family from the list of EFamily the candidate is matched against at read time.
RemoveFlipping	Removes the flipping from the list of EFlipping the candidate is matched against at read time.
RemoveLogicalSize	Removes the logical size from the list of ELogicalSize the candidate is matched against at read time.

ESearchParamsType.AddContrast

This method is deprecated.

Adds a new contrast mode to the list of EMatrixCodeContrastMode the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

[C#]

```
void AddContrast(
 Euresys.Open_eVision.EMatrixCodeContrastMode searchContrast
 )
```

Parameters

searchContrast

Contrast mode to add to the list.

ESearchParamsType.AddFamily

This method is deprecated.

Adds a new family to the list of EFamily the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void AddFamily(
 Euresys.Open_eVision.EFamily searchFamily
 )
```

Parameters

searchFamily

Family to add to the list.

ESearchParamsType.AddFlipping

This method is deprecated.

Adds a new flipping to the list of EFlipping the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void AddFlipping(
 Euresys.Open_eVision.EFlipping searchFlipping
 )
```

Parameters

searchFlipping

Flipping to add to the list.

ESearchParamsType.AddLogicalSize

This method is deprecated.

Adds a new logical size to the list of ELogicalSize the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void AddLogicalSize(
 Euresys.Open_eVision.ELogicalSize searchLogicalSize
 )
```

Parameters

searchLogicalSize

Logical size to add to the list.

ESearchParamsType.ClearContrast

This method is deprecated.

Clears the list of contrast modes the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearContrast(
 )
```

ESearchParamsType.ClearFamily

This method is deprecated.

Clears the list of families the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearFamily(
 )
```

ESearchParamsType.ClearFlipping

This method is deprecated.

Clears the list of flippings the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void ClearFlipping(
 )
```

ESearchParamsType.ClearLogicalSize

This method is deprecated.

Clears the list of logical sizes the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

[C#]

```
void ClearLogicalSize(
 )
```

ESearchParamsType.ContrastCount

This property is deprecated.

The size of the list of EMatrixCodeContrastMode the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

[C#]

```
int ContrastCount
  { get; }
```

ESearchParamsType.FamilyCount

This property is deprecated.

The size of the list of EFamily the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

[C#]

```
int FamilyCount
  { get; }
```

ESearchParamsType.FlippingCount

This property is deprecated.

The size of the list of EFlipping the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

[C#]

```
int FlippingCount
```

```
{ get; }
```

ESearchParamsType.GetContrast

This method is deprecated.

Gets an item in the list of EMatrixCodeContrastMode the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EMatrixCodeContrastMode GetContrast(
 int index
 )
```

Parameters

index

Position in the list.

ESearchParamsType.GetFamily

This method is deprecated.

Gets an item in the list of EFamily the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFamily GetFamily(
 int index
 )
```

Parameters

index

Position in the list.

ESearchParamsType.GetFlipping

This method is deprecated.

Gets an item in the list of EFlipping the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EFlipping GetFlipping(
 int index
 )
```

Parameters

index

Position in the list.

ESearchParamsType.GetLogicalSize

This method is deprecated.

Gets an item in the list of ELogicalSize the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ELogicalSize GetLogicalSize(
 int index
 )
```

Parameters

index

Position in the list.

ESearchParamsType.LogicalSizeCount

This property is deprecated.

The size of the list of ELogicalSize the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
int LogicalSizeCount
  { get; }
```

ESearchParamsType.RemoveContrast

This method is deprecated.

Removes the contrast mode from the list of EMatrixCodeContrastMode the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveContrast(
 Euresys.Open_eVision.EMatrixCodeContrastMode searchContrast
 )
```

Parameters

searchContrast

Contrast mode to remove from the list.

ESearchParamsType.RemoveFamily

This method is deprecated.

Removes the family from the list of EFamily the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveFamily(
 Euresys.Open_eVision.EFamily searchFamily
 )
```

Parameters

searchFamily

Family to remove from the list.

ESearchParamsType.RemoveFlipping

This method is deprecated.

Removes the flipping from the list of EFlipping the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveFlipping(
 Euresys.Open_eVision.EFlipping searchFlipping
 )
```

Parameters

searchFlipping

Flipping to remove from the list.

ESearchParamsType.RemoveLogicalSize

This method is deprecated.

Removes the logical size from the list of ELogicalSize the candidate is matched against at read time.

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveLogicalSize(
 Euresys.Open_eVision.ELogicalSize searchLogicalSize
 )
```

Parameters

searchLogicalSize

Logical size to remove from the list.

4.231. ESerializer Class

Abstract interface for file-like objects.

Remarks

The ESerializer object manages operations of reading from and writing to an archive (a file on the system hard disk, for instance). ESerializer objects cannot be instantiated directly. To create an ESerializer object, one of the following static factory methods has to be used:

Note. An ESerializer object can not be used in the same time for reading and writing. So, ESerializer::CreateFileWriter creates an ESerializer object that should be used with Save methods and ESerializer::CreateFileReader creates an ESerializer object that should be used with Load methods.

Derived Class(es):EFilePointerSerializerEFileSerializerEMemorySerializer

Namespace: Euresys.Open_eVision

Properties

Writing	Returns true if the ESerializer object has been created for writing and false otherwise.

Methods

Close	Closes the file associated with the ESerializer object.
CreateFileReader	Returns an ESerializer object suitable for reading from a file.
CreateFileWriter	Returns an ESerializer object suitable for opening a file and writing into it.
CreateMemoryReader	Returns an ESerializer object suitable for reading from a buffer.
CreateMemoryWriter	Returns an ESerializer object suitable for serializing into a buffer.

ESerializer.Close

Closes the file associated with the ESerializer object.

Namespace: Euresys.Open_eVision

[C#]

```
void Close(
 )
```

ESerializer.CreateFileReader

Returns an ESerializer object suitable for reading from a file.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESerializer CreateFileReader(
 string filePath
 )
```

Parameters

filePath

Full path and name specification of the file to be used to create the ESerializer object.

Remarks

It is up to users to delete the ESerializer object when they have done using it in Load calls. If the call does not succeed, it returns NULL. Please check the Open eVision error code to get further informations.

ESerializer.CreateFileWriter

Returns an ESerializer object suitable for opening a file and writing into it.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESerializer CreateFileWriter(
 string filePath,
 Euresys.Open_eVision.ESerializerFileWriterMode mode
 )
```

Parameters

filePath

Full path and name specification of the file to be used to create the ESerializer object.

mode

Creation mode of the storage file, as defined by ESerializerFileWriterMode (by default, Create).

Remarks

The ESerializerFileWriterMode parameter is an enumerated type that allows to control what happens when the file already exists: * If mode is Create, the call will not succeed if the file already exists. * If mode is Overwrite, the existing file will be overwritten. * If mode is Append, the new data will be appended to the existing file content. It is up to users to delete the ESerializer object when they have done using it in Save calls. If the call does not succeed, it returns NULL. Please check the Open eVision error code to get further information.

ESerializer.CreateMemoryReader

Returns an ESerializer object suitable for reading from a buffer.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESerializer CreateMemoryReader(
 IntPtr buffer,
 uint size
 )
```

Parameters

buffer

Address of the buffer to be used by the memory serializer.

size

Size of the buffer to be used by the memory serializer.

Remarks

The buffer is copied inside the internal memory of the serializer. It is up to users to delete the ESerializer object when they have done using it in Load calls.

ESerializer.CreateMemoryWriter

Returns an ESerializer object suitable for serializing into a buffer.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESerializer CreateMemoryWriter(
 )
```

```
Euresys.Open_eVision.ESerializer CreateMemoryWriter(
 uint initialBufferSize
 )

Euresys.Open_eVision.ESerializer CreateMemoryWriter(
 IntPtr buffer,
 uint size
 )
```

Parameters

initialBufferSize

-

buffer

Address of the buffer to be used by the memory serializer.

size

Size of the buffer to be used by the memory serializer.

Remarks

If a buffer is not provided, a buffer will be automatically created. Please note that, in this case, if you didn't provide a size, the buffer will be automatically resized as needed. It is up to users to delete the ESerializer object when they have done using it in Save calls. The returned serializer underlying type is EMemorySerializer, for more information, see the class documentation.

ESerializer.Writing

Returns true if the ESerializer object has been created for writing and false otherwise.

Namespace: Euresys.Open_eVision

[C#]

```
abstract bool Writing
  { get; }
```

4.232. EShape Class

Abstract class to federate the classes that can be hierarchically attached together (from a geometrical point of view).

Derived Class (es):
ECircleShape
EFrameShape
ELineShapeEPointShapeEPolygonShapeERectangleShapeEWedgeShapeEWorldShape

Namespace: Euresys.Open_eVision

Properties

Active	Flag indicating whether the shape is active or not.
ActiveRecursive	Sets the flag indicating whether the shape and all its daughters are active or not.
ActualShape	Flag indicating whether an inquiry returns a result pertaining to the nominal gauge (false, default) or the fitted model (true).
ActualShapeRecursive	Sets the flag indicating whether an inquiry returns a result pertaining to the nominal gauge (false, default) or the fitted model (true). The flag is set in this shape and all its daughters.
ClosestShape	Closest shape among the daughters.
Dragable	Flag indicating whether the shape can be dragged or not.
DragableRecursive	Sets the flag indicating whether the shape and all its daughters can be dragged or not.
HitHandle	Handle currently under the cursor.
HitShape	Pointer to the shape currently under the cursor.
Labeled	Flag indicating whether the shape label should be displayed or not.
LabeledRecursive	Sets the flag indicating whether the shape label should be displayed or not. The flag is set in this shape and all its daughters.
Mother	Pointer to the mother shape.
Name	Name of the EShape object.
NumDaughters	Number of daughters attached to the shape.
PanX	Current horizontal panning value for drawing operations, expressed in pixels. By default, no panning occurs.
PanY	Current vertical panning value for drawing operations, expressed in pixels. By default, no panning occurs.
Resizable	Flag indicating whether the shape can be resized or not.
ResizableRecursive	Sets the flag indicating whether the shape and all its daughters can be resized or not.
Rotatable	Flag indicating whether the shape can be rotated or not.
RotatableRecursive	Sets the flag indicating whether the shape and all its daughters can be rotated or not.
Selectable	Flag indicating whether the shape can be selected or not.
SelectableRecursive	Sets the flag indicating whether the shape and all its daughters can be selected or not.
Selected	Flag indicating whether the shape is selected or not.
SelectedRecursive	Sets the flag indicating whether the shape and all its daughters are selected or not.
Type	Shape type.
Visible	Flag indicating whether the shape is visible or not.

VisibleRecursive	Sets the flag indicating whether the shape and its daughter shapes are visible or not.
WorldShape	World ancestor.
ZoomX	Current horizontal zooming factor for drawing operations.
ZoomY	Current vertical zooming factor for drawing operations.

Methods

Attach	Attaches the gauge to a mother gauge or shape.
Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
Detach	Detaches the gauge from its mother gauge or shape.
DetachDaughters	Detaches the daughter gauges or shapes.
DisableBehaviorFilter	Disables (i.e. removes) a condition from the list of conditions in the behavior filter.
DisableTypeFilter	Enables all shape types
Drag	Moves a handle to a new position and updates the position parameters of the shape.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
EnableBehaviorFilter	Modifies the so-called **behavior filter** that is a conjunction of conditions specifying when a shape or a gauge should be displayed or taken into consideration when monitoring the mouse interactions.
EnableTypeFilter	Enables the filter of the specified shape type
GetAllocated	Gets the allocated flag.
GetDaughter	Returns a pointer to the specified daughter gauge or shape.
GetDraggingMode	Gets the dragging mode which defines how the shape could be dragged.
GetFound	Flag indicating whether a measured shape has been found.
GetProperty	Gets the value of property aProperty. Throws an exception if no such property exists.
GetShapeNamed	Returns a pointer to a daughter gauge or shape specified by its name.
HasProperty	Returns whether a EShape has a property named aProperty.
HasValidPolarityProperty	Returns whether the EShape has a valid polarity property. I.e. if it has a property named "polarity" whose value is either "inverted" or "direct".
HitTest	Checks if there is a handle under the cursor.
InvalidateWorld	Invalidates the world shape for this shape and all its ancestors

Load	Loads a Shape.The given ESerializer must have been created for reading.
LocalToSensor	Transforms a point from local coordinates to sensor coordinates.
RemoveProperty	Removes the property name aProperty from the EShape.
Save	Loads a Shape.The given ESerializer must have been created for writing.
SensorToLocal	Transforms a point from sensor coordinates to local coordinates.
SetAllocated	Sets the allocated flag.
SetCursor	Sets the cursor current coordinates.
SetDraggingMode	Sets the dragging mode which defines how the shape could be dragged.
SetPan	Sets the horizontal and vertical panning values for drawing operations, expressed in pixels.
SetProperty	Sets the value of property aProperty to aValue for this EShape.
SetPropertyRecursive	Sets the value of property aProperty to aValue for this EShape and all of its daughters.
SetZoom	Sets the horizontal and vertical zooming factors for drawing operations.

EShape.Active

Flag indicating whether the shape is active or not.

Namespace: Euresys.Open_eVision

[C#]

```
virtual bool Active
  { get; set; }
```

EShape.ActiveRecursive

Sets the flag indicating whether the shape and all its daughters are active or not.

Namespace: Euresys.Open_eVision

[C#]

```
virtual bool ActiveRecursive
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying EShape::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

EShape.ActualShape

Flag indicating whether an inquiry returns a result pertaining to the nominal gauge (false, default) or the fitted model (true).

Namespace: Euresys.Open_eVision

[C#]

```
bool ActualShape
  { get; set; }
```

EShape.ActualShapeRecursive

Sets the flag indicating whether an inquiry returns a result pertaining to the nominal gauge (false, default) or the fitted model (true). The flag is set in this shape and all its daughters.

Namespace: Euresys.Open_eVision

[C#]

```
bool ActualShapeRecursive
  { get; set; }
```

EShape.Attach

Attaches the gauge to a mother gauge or shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Attach(
 Euresys.Open_eVision.EShape mother
 )
```

Parameters

mother

Pointer to the mother gauge or shape.

Remarks

When attached to a mother gauge, be aware that daughter gauges are not positioned according to the nominal mother gauge position, but to its corresponding fitted model.

EShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

```
[C#]
void Closest(
 )
```

EShape.ClosestShape

Closest shape among the daughters.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EShape ClosestShape
  { get; }
```

Remarks

Use EShape::Closest to recompute the closest shape.

EShape.Detach

Detaches the gauge from its mother gauge or shape.

Namespace: Euresys.Open_eVision

```
[C#]
void Detach(
 )
```

EShape.DetachDaughters

Detaches the daughter gauges or shapes.

Namespace: Euresys.Open_eVision

```
[C#]
void DetachDaughters(
 )
```

EShape.DisableBehaviorFilter

Disables (i.e. removes) a condition from the list of conditions in the behavior filter.

Namespace: Euresys.Open_eVision

[C#]

```
void DisableBehaviorFilter(
 Euresys.Open_eVision.EShapeBehavior behavior
 )
```

Parameters

behavior

The behavior of the shape to be removed from the behavior filter.

Remarks

The condition to be disabled is identified by the behavior about which the condition is. Disabling a behavior leads to less restrictive conditions for the Draw and HitTest methods to be actually carried on.

EShape.DisableTypeFilter

Enables all shape types

Namespace: Euresys.Open_eVision

[C#]

```
void DisableTypeFilter(
 )
```

EShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

EShape.Dragable

Flag indicating whether the shape can be dragged or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Dragable
  { get; set; }
```

EShape.DragableRecursive

Sets the flag indicating whether the shape and all its daughters can be dragged or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool DragableRecursive
  { get; set; }
```

EShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EShape.EnableBehaviorFilter

Modifies the so-called **behavior filter** that is a conjunction of conditions specifying when a shape or a gauge should be displayed or taken into consideration when monitoring the mouse interactions.

Namespace: Euresys.Open_eVision

```
[C#]
void EnableBehaviorFilter(
 Euresys.Open_eVision.EShapeBehavior behavior,
 bool value
 )
```

Parameters

behavior

The behavior of the shape to be tested.

value

The value at which the behavior property should be set to pass the test. By default, equals True.

Remarks

This method registers a new necessary condition for the Draw and HitTest families of methods to be actually carried on. Such a condition is about the behavior of the shape, as specified by the behavior argument. Initially, the behavior filter contains an empty list of conditions, which means that the Draw and HitTest methods will always be executed. Adding a new condition through EShape::EnableBehaviorFilter will introduce a new restriction on the effective execution of these methods. Use EShape::DisableBehaviorFilter to remove a condition from the behavior filter.

EShape.EnableTypeFilter

Enables the filter of the specified shape type

Namespace: Euresys.Open_eVision

```
[C#]
void EnableTypeFilter(
 uint un32Types
 )
```

Parameters

un32Types

The type of the shape to filter.

EShape.GetAllocated

Gets the allocated flag.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetAllocated(
 )
```

EShape.GetDaughter

Returns a pointer to the specified daughter gauge or shape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EShape GetDaughter(
 uint index
 )
```

Parameters

index

Daughter gauge or shape index.

EShape.GetDraggingMode

Gets the dragging mode which defines how the shape could be dragged.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EDraggingMode GetDraggingMode(
 )
```

EShape.GetFound

Flag indicating whether a measured shape has been found.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetFound(
 )
```

Remarks

After calling Process() or Measure() on a gauge object, use GetFound() to get the status of the measurement.

EShape.GetProperty

Gets the value of property aProperty. Throws an exception if no such property exists.

Namespace: Euresys.Open_eVision

[C#]

```
string GetProperty(
 string aProperty
 )
```

Parameters

aProperty

The name of the property.

EShape.GetShapeNamed

Returns a pointer to a daughter gauge or shape specified by its name.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EShape GetShapeNamed(
 string name
 )
```

Parameters

name

Name of the daughter gauge or shape.

EShape.HasProperty

Returns whether a EShape has a property named aProperty.

Namespace: Euresys.Open_eVision

[C#]

```
bool HasProperty(
 string aProperty
 )
```

Parameters

aProperty

The name of the property.

EShape.HasValidPolarityProperty

Returns whether the EShape has a valid polarity property.
I.e. if it has a property named "polarity" whose value is either "inverted" or "direct".

Namespace: Euresys.Open_eVision

```
[C#]
bool HasValidPolarityProperty(
 )
```

Remarks

The "polarity" property is mostly used to define the orientation of the gradient in a shape of a EVectorModel.

EShape.HitHandle

Handle currently under the cursor.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EDragHandle HitHandle
  { get; }
```

Remarks

When the cursor is over a particular handle, its shape could be changed for feedback.

EShape.HitShape

Pointer to the shape currently under the cursor.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EShape HitShape
  { get; }
```

Remarks

When the cursor is over a particular shape, its shape could be changed for feedback.

EShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

EShape.InvalidateWorld

Invalidates the world shape for this shape and all its ancestors

Namespace: Euresys.Open_eVision

```
[C#]
void InvalidateWorld(
 )
```

EShape.Labeled

Flag indicating whether the shape label should be displayed or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool Labeled
   { get; set; }
```

EShape.LabeledRecursive

Sets the flag indicating whether the shape label should be displayed or not. The flag is set in this shape and all its daughters.

Namespace: Euresys.Open_eVision

```
[C#]
bool LabeledRecursive
```

```
{ get; set; }
```

EShape.Load

Loads a Shape.The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path,
 bool daughters
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer,
 bool daughters
 )
```

Parameters

path

The file path.

daughters

Indicates if the load must be done on the whole hierarchy or just this object.

serializer

Pointer to the ESerializer created for reading.

EShape.LocalToSensor

Transforms a point from local coordinates to sensor coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint LocalToSensor(
 Euresys.Open_eVision.EPoint LPoint
 )
```

Parameters

LPoint

The point in local coordinates.

EShape.Mother

Pointer to the mother shape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EShape Mother
    { get; }
```

EShape.Name

Name of the EShape object.

Namespace: Euresys.Open_eVision

```
[C#]
string Name
    { get; set; }
```

EShape.NumDaughters

Number of daughters attached to the shape.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumDaughters
    { get; }
```

EShape.PanX

Current horizontal panning value for drawing operations, expressed in pixels. By default, no panning occurs.

Namespace: Euresys.Open_eVision

```
[C#]
virtual float PanX
    { get; }
```

EShape.PanY

Current vertical panning value for drawing operations, expressed in pixels. By default, no panning occurs.

Namespace: Euresys.Open_eVision

[C#]

```
virtual float PanY
  { get; }
```

EShape.RemoveProperty

Removes the property name aProperty from the EShape.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveProperty(
 string aProperty
 )
```

Parameters

aProperty

The name of the property.

EShape.Resizable

Flag indicating whether the shape can be resized or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Resizable
  { get; set; }
```

EShape.ResizableRecursive

Sets the flag indicating whether the shape and all its daughters can be resized or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool ResizableRecursive
  { get; set; }
```

EShape.Rotatable

Flag indicating whether the shape can be rotated or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Rotatable
  { get; set; }
```

EShape.RotatableRecursive

Sets the flag indicating whether the shape and all its daughters can be rotated or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool RotatableRecursive
  { get; set; }
```

EShape.Save

Loads a Shape.The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path,
 bool daughters
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer,
 bool daughters
 )
```

Parameters

path
The file path.

daughters
Indicates if the save must be done on the whole hierarchy or just this object.

serializer
Pointer to the ESerializer created for writing.

EShape.Selectable

Flag indicating whether the shape can be selected or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Selectable
  { get; set; }
```

EShape.SelectableRecursive

Sets the flag indicating whether the shape and all its daughters can be selected or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool SelectableRecursive
  { get; set; }
```

EShape.Selected

Flag indicating whether the shape is selected or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool Selected
  { get; set; }
```

EShape.SelectedRecursive

Sets the flag indicating whether the shape and all its daughters are selected or not.

Namespace: Euresys.Open_eVision

[C#]

```
bool SelectedRecursive
  { get; set; }
```

EShape.SensorToLocal

Transforms a point from sensor coordinates to local coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint SensorToLocal(
 Euresys.Open_eVision.EPoint SPoint
 )
```

Parameters

SPoint

The point in sensor coordinates.

EShape.SetAllocated

Sets the allocated flag.

Namespace: Euresys.Open_eVision

```
[C#]
void SetAllocated(
 bool bAllocated,
 bool bDaughters
 )
```

Parameters

bAllocated

Whether to set the allocated flag or not.

bDaughters

Indicates if the set must be done in the whole hierarchy or just this object.

EShape.SetCursor

Sets the cursor current coordinates.

Namespace: Euresys.Open_eVision

```
[C#]
void SetCursor(
 int x,
 int y
 )
```

Parameters

x

Cursor current coordinates.

y

Cursor current coordinates.

EShape.SetDraggingMode

Sets the dragging mode which defines how the shape could be dragged.

Namespace: Euresys.Open_eVision

```
[C#]
void SetDraggingMode(
 Euresys.Open_eVision.EDraggingMode eDraggingMode,
 bool bDaughters
 )
```

Parameters

eDraggingMode

The draggingMode.

bDaughters

Indicates if the set must be done in the whole hierarchy or just this object.

EShape.SetPan

Sets the horizontal and vertical panning values for drawing operations, expressed in pixels.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPan(
 float panX,
 float panY
 )
```

Parameters

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

All objects attached to an EWorldShape object inherit of the same panning factor.

EShape.SetProperty

Sets the value of property aProperty to aValue for this EShape.

Namespace: Euresys.Open_eVision

```
[C#]
void SetProperty(
 string aProperty,
 string aValue
 )
```

Parameters

aProperty

The name of the property.

aValue

The value of the property.

Remarks

You may use a shape property to define the orientation of the gradient in a shape of a EVectorModel. This is done by setting a property named "polarity" to "inverted" or "direct". Additionally, you may set any property to any value for your own needs.

EShape.SetPropertyRecursive

Sets the value of property aProperty to aValue for this EShape and all of its daughters.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPropertyRecursive(
 string aProperty,
 string aValue
 )
```

Parameters

aProperty

The name of the property.

aValue

The value of the property.

EShape.SetZoom

Sets the horizontal and vertical zooming factors for drawing operations.

Namespace: Euresys.Open_eVision

```
[C#]
void SetZoom(
 float zoomX,
 float zoomY
 )
```

Parameters

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

Remarks

All objects attached to an EWorldShape inherit of the same zooming factor.

EShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
abstract Euresys.Open_eVision.EShapeType Type
  { get; }
```

EShape.Visible

Flag indicating whether the shape is visible or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool Visible
  { get; set; }
```

EShape.VisibleRecursive

Sets the flag indicating whether the shape and its daughter shapes are visible or not.

Namespace: Euresys.Open_eVision

```
[C#]
bool VisibleRecursive
  { get; set; }
```

EShape.WorldShape

World ancestor.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EWorldShape WorldShape
  { get; }
```

EShape.ZoomX

Current horizontal zooming factor for drawing operations.

Namespace: Euresys.Open_eVision

[C#]

```
virtual float ZoomX
  { get; }
```

EShape.ZoomY

Current vertical zooming factor for drawing operations.

Namespace: Euresys.Open_eVision

[C#]

```
virtual float ZoomY
  { get; }
```

4.233. ESimpleCropper Class

Manages a point cloud cropper based on X/Y/Z value ranges.

Namespace: Euresys.Open_eVision.Easy3D

Properties

XRange	Allowed value range along the X axis. Pass NULL if no cropping should be done along this axis.
YRange	Allowed value range along the Y axis. Pass NULL if no cropping should be done along this axis.
ZRange	Allowed value range along the Z axis. Pass NULL if no cropping should be done along this axis.

Methods

Crop	Crops a point cloud.

ESimpleCropper	Creates an ESimpleCropper object.
operator=	Assignment operator
operator==	Equality operator.

ESimpleCropper.Crop

Crops a point cloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Crop(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut
 )
```

Parameters

cloudIn

Cloud to be cropped.

cloudOut

Cropped cloud.

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

ESimpleCropper.ESimpleCropper

Creates an ESimpleCropper object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ESimpleCropper(
 )

void ESimpleCropper(
 Euresys.Open_eVision.EFloatRange rangeX,
 Euresys.Open_eVision.EFloatRange rangeY,
 Euresys.Open_eVision.EFloatRange rangeZ
 )

void ESimpleCropper(
 Euresys.Open_eVision.Easy3D.ESimpleCropper other
 )
```

Parameters

rangeX

Allowed value range along the X axis. Pass NULL if no cropping should be done along this axis.

rangeY

Allowed value range along the Y axis. Pass NULL if no cropping should be done along this axis.

rangeZ

Allowed value range along the Z axis. Pass NULL if no cropping should be done along this axis.

other

An other ESimpleCropper

ESimpleCropper.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ESimpleCropper operator=(
 Euresys.Open_eVision.Easy3D.ESimpleCropper other
 )
```

Parameters

other

An other ESimpleCropper

ESimpleCropper.operator==

Equality operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.ESimpleCropper other
 )
```

Parameters

other

An other ESimpleCropper.

ESimpleCropper.XRange

Allowed value range along the X axis. Pass NULL if no cropping should be done along this axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange XRange
  { get; set; }
```

ESimpleCropper.YRange

Allowed value range along the Y axis. Pass NULL if no cropping should be done along this axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange YRange
  { get; set; }
```

ESimpleCropper.ZRange

Allowed value range along the Z axis. Pass NULL if no cropping should be done along this axis.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EFloatRange ZRange
  { get; set; }
```

4.234. ESphereFitter Class

A ESphereFitter object is used to fit an E3DSphere on an EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

Methods

ESphereFitter	Constructor of an ESphereFitter object.
Fit	Fits an E3DSphere on a given EPointCloud.
Load	Loads the ESphereFitter configuration. The given ESerializer must have been created for reading.

operator=	Assignment operator.
Save	Saves the ESphereFitter configuration. The given ESerializer must have been created for writing.

ESphereFitter.ESphereFitter

Constructor of an ESphereFitter object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ESphereFitter(
 )
void ESphereFitter(
 Euresys.Open_eVision.Easy3D.ESphereFitter other
 )
```

Parameters

other

Reference to the ESphereFitter used for the initialization.

ESphereFitter.Fit

Fits an E3DSphere on a given EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DSphere Fit(
 Euresys.Open_eVision.Easy3D.EPointCloud pc
 )
Euresys.Open_eVision.Easy3D.E3DSphere Fit(
 Euresys.Open_eVision.Easy3D.EPointCloud pc,
 out float averageDistance
 )
```

Parameters

pc

The reference to the point cloud.

averageDistance

The reference to a float which will store the average distance from this sphere to the points that were used for the fit.

ESphereFitter.Load

Loads the ESphereFitter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ESphereFitter.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ESphereFitter operator=(
 Euresys.Open_eVision.Easy3D.ESphereFitter other
 )
```

Parameters

other

The ESphereFitter object that should be copied.

ESphereFitter.Save

Saves the ESphereFitter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

4.235. ESphericalCropper Class

Manages a spherical point cloud cropper.

Namespace: Euresys.Open_eVision.Easy3D

Methods

Crop	Crops a point cloud.
ESphericalCropper	Creates an ESphericalCropper object.
operator=	Assignment operator.
operator==	Equality operator.

ESphericalCropper.Crop

Crops a point cloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Crop(
 Euresys.Open_eVision.Easy3D.EPointCloud cloudIn,
 Euresys.Open_eVision.Easy3D.EPointCloud cloudOut,
 bool invertCrop
 )
```

Parameters

cloudIn

Cloud to be cropped.

cloudOut

Cropped cloud.

invertCrop

Indicates if the points kept must be the points inside (true) or outside (false) the sphere.

Remarks

The input point cloud 'cloudIn' should be different from the output point cloud 'cloudOut'. If not a exception will be thrown.

ESphericalCropper.ESphericalCropper

Creates an ESphericalCropper object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ESphericalCropper(
 Euresys.Open_eVision.Easy3D.E3DPoint center,
 float radius
 )
void ESphericalCropper(
 Euresys.Open_eVision.Easy3D.ESphericalCropper other
 )
```

Parameters

center

Center of the sphere.

radius

Radius of the sphere.

other

An other ESphericalCropper.

ESphericalCropper.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.ESphericalCropper operator=(
 Euresys.Open_eVision.Easy3D.ESphericalCropper other
 )
```

Parameters

other

An other ESphericalCropper.

ESphericalCropper.operator==

Equality operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.ESphericalCropper other
 )
```

Parameters

other

An other ESphericalCropper.

4.236. ESpot Class

The ESpot store information about the detections produced by ESpotDetector. A spot is defined by a type (particle or scratch), a polarity (black or white) and a geometry. The geometry is an arbitrary rectangle, represented by a ERotatedBoundingBox.

Namespace: Euresys.Open_eVision

Properties

Area	Get the area of the spot (in number of pixels).
Box	Returns the rotated rectangle representing the spot.
Center	Get the center point of the spot.
DLLabel	Returns the Deep Learning classification label. This information is available when the Deep Learning classification has been activated by ESpotDetector. See also ESpot.
DLProbability	Returns the Deep Learning classification probability. This information is available when the Deep Learning classification has been activated by ESpotDetector. See also ESpot.
Height	Get the height of the bounding box of spot.
Polarity	Get the polarity of the spot, i.e. whether it is White, Black or Any. A Spot's polarity is the same as the polarity setting of the detector when the spot was detected.

Region	Returns the ERegion of the spot (the pixels composing the spot)
ROI	Returns the EROIBW8 of the spot (axis aligned bounding box). The returned ROI is not attached to an image.
Strength	Get the strength of the spot (the average grey scale value over the local image background).
Type	Get the type of the spot, i.e. whether it is a Scratch or a Particle.
Width	Get the width of the bounding box of spot.

Methods

Draw	Draw the ESpot.
ESpot	Constructs an ESpot with default (invalid) values
Load	Loads the ESpot. The given ESerializer must have been created for reading.
operator!=	Check if two ESpot are different.
operator=	Assignment operator
operator==	Check if two ESpot are identical.
Save	Saves the ESpot. The given ESerializer must have been created for writing.

ESpot.Area

Get the area of the spot (in number of pixels).

Namespace: Euresys.Open_eVision

```
[C#]
uint Area
  { get; }
```

ESpot.Box

Returns the rotated rectangle representing the spot.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERotatedBoundingBox Box
  { get; }
```

ESpot.Center

Get the center point of the spot.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; }
```

ESpot.DLLabel

Returns the Deep Learning classification label. This information is available when the Deep Learning classification has been activated by ESpotDetector.
See also ESpot.

Namespace: Euresys.Open_eVision

[C#]

```
string DLLabel
  { get; }
```

ESpot.DLProbability

Returns the Deep Learning classification probability. This information is available when the Deep Learning classification has been activated by ESpotDetector.
See also ESpot.

Namespace: Euresys.Open_eVision

[C#]

```
float DLProbability
  { get; }
```

ESpot.Draw

Draw the ESpot.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 float extension,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 float extension,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

extension

Extension in pixels of the draw rectangle around the spot. Only used for Particle.

color

Color of the draw rectangle.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

graphicContext

-

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ESpot.ESpot

Constructs an ESpot with default (invalid) values

Namespace: Euresys.Open_eVision

```
[C#]
void ESpot(
 )
void ESpot(
 Euresys.Open_eVision.ESpot other
 )
```

Parameters

other

-

ESpot.Height

Get the height of the bounding box of spot.

Namespace: Euresys.Open_eVision

```
[C#]
float Height
  { get; }
```

ESpot.Load

Loads the ESpot. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ESpot.operator!=

Check if two ESpot are different.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.ESpot other
 )
```

Parameters

other

The other object.

ESpot.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ESpot operator=(
 Euresys.Open_eVision.ESpot other
 )
```

Parameters

other

-

ESpot.operator==

Check if two ESpot are identical.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ESpot other
 )
```

Parameters

other

The other object.

ESpot.Polarity

Get the polarity of the spot, i.e. whether it is White, Black or Any. A Spot's polarity is the same as the polarity setting of the detector when the spot was detected.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESpotPolarity Polarity
  { get; }
```

ESpot.Region

Returns the ERegion of the spot (the pixels composing the spot)

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERegion Region
  { get; }
```

ESpot.ROI

Returns the EROIBW8 of the spot (axis aligned bounding box). The returned ROI is not attached to an image.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW8 ROI
  { get; }
```

ESpot.Save

Saves the ESpot. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

ESpot.Strength

Get the strength of the spot (the average grey scale value over the local image background).

Namespace: Euresys.Open_eVision

[C#]

```
float Strength
  { get; }
```

ESpot.Type

Get the type of the spot, i.e. whether it is a Scratch or a Particle.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESpotType Type
  { get; }
```

ESpot.Width

Get the width of the bounding box of spot.

Namespace: Euresys.Open_eVision

[C#]

```
float Width
  { get; }
```

4.237. ESpotDetector Class

ESpotDetector is dedicated to the detection of spots, particles and scratches on images. It is especially efficient at detecting faint contaminations on noisy surface images. It produces a list of ESpot objects.

Namespace: Euresys.Open_eVision

Properties

AlignmentArea	Sets/Gets an initial estimate of the rectangle on which spots will be detected in the image. The alignment process is enabled with ESpotDetector::EnableAlignment. To perform the alignment, a tolerance must be set as well, see ESpotDetector::AlignmentTolerance.

AlignmentTolerance	Sets/Gets the tolerance around the initial estimate of the alignment area, in pixels. The default is 100 pixels. See also ESpotDetector::AlignmentArea.
DLClassifierPath	Opens a DL classifier and use it to classify all further detected spots. The resulting class is stored in ESpot. Use ESpotDetector::UnsetDLClassifier to remove the Deep Learning classification.
DLExecutionSettings	Controls the execution settings of the DL Classifier. Set the class EDeepLearningExecutionSettings to choose between engines, devices and other inference parameters.
EnableAlignment	Enables or disables the optional alignment process. The alignment area and the tolerance must be set as well, see ESpotDetector::AlignmentArea and ESpotDetector::AlignmentTolerance.
NumSpots	Gets the number of spots detected by a previous call to ESpotDetector::Detect.
SourceROI	Gets the last used Region Of Interest, after optionnal alignment and guard band clipping. See also ESpotDetector::EnableAlignment and ESpotDetector::SetGuardBand.
Spots	Gets the spots detected by a previous call to ESpotDetector::Detect.

Methods

AddDetectedSpotsToDLProject	To be called after ESpotDetector::Detect to add the detected spots to a new or existing EDeepLearningProject. This method returns the number of spots added. The image used by ESpotDetector::Detect is copied to a subdirectory 'Images' of the project file and linked in the project. All detected spots are added to the project as ROI of the image, with the label depending on the spot type ('Particle' or 'Scratch'). Optional parameter roiExtension can be used to increase the ROI size by a pixel amount. It could help the deep learning inference to have a 'context' around the ROI. Automatic image names are generated unless the parameter imageName is set. All images must have a different name. The optional parameter noDefectSamples sets the number of extra ROIs added to the project representing areas without defect. The label of these defects are given by parameter noDefectLabel.
Detect	Performs the spot detection in the given EROIBW8. It returns the number of spot detected. Use ESpotDetector the retrieve the list of detected spots.
Draw	Draw the ESpotDetector.
ESpotDetector	Constructs an ESpotDetector with default configuration.
GetDetectionThreshold	Gets the detection threshold for the given spot type.
GetEnableType	Returns the state for the detection of a spot type. See also ESpotDetector::SetEnableType.
GetGuardBand	Gets the guard band borders in pixels. See also ESpotDetector::SetGuardBand.

GetMinimumArea	Gets the minimum spot area in pixels.
GetPolarity	Gets the spot polarity configuration. See also ESpotDetector::SetPolarity.
GetSizes	Gets the spot size range configuration.
IsDLClassifierSet	Returns True if a classifier has been loaded. See also ESpotDetector and ESpotDetector::UnsetDLClassifier.
Load	Loads the ESpotDetector. The given ESerializer must have been created for reading.
operator=	Assignment operator
operator==	Comparison operator
Save	Saves the ESpotDetector. The given ESerializer must have been created for writing.
SetDetectionThreshold	Sets the detection threshold. Default: 20 for Particle, 10 for Scratch.
SetEnableType	Enables or disables the detection of a spot type. Default: true for Particle, false for Scratch. See also ESpotDetector::GetEnableType.
SetGuardBand	Sets a border, in pixels, to exclude perturbed image data and avoid misdetections near the edges of the alignment area. The default is 0.
SetMinimumArea	Sets the minimum spot area in pixels. Default: 20 for Particle and 100 for Scratch.
SetPolarity	Sets the spot polarity configuration. Default: Any for Particle and Scratch.
SetSizes	Sets the spot size range configuration. Default: 5 and 64 for Particle, 8 and 256 for Scratch.
UnsetDLClassifier	Disable the usage of the Deep Learning classifier. Throws an exception if no DL classifier is loaded. See also ESpotDetector and ESpotDetector::IsDLClassifierSet.

ESpotDetector.AddDetectedSpotsToDLProject

To be called after ESpotDetector::Detect to add the detected spots to a new or existing EDeepLearningProject. This method returns the number of spots added.
The image used by ESpotDetector::Detect is copied to a subdirectory 'Images' of the project file and linked in the project. All detected spots are added to the project as ROI of the image, with the label depending on the spot type ('Particle' or 'Scratch'). Optional parameter roiExtension can be used to increase the ROI size by a pixel amount. It could help the deep learning inference to have a 'context' around the ROI. Automatic image names are generated unless the parameter imageName is set. All images must have a different name. The optional parameter noDefectSamples sets the number of extra ROIs added to the project representing areas without defect. The label of these defects are given by parameter noDefectLabel.

Namespace: Euresys.Open_eVision

[C#]

```
uint AddDetectedSpotsToDLProject(
 string projectPath,
 uint roiExtension,
 string imageName,
 uint noDefectSamples,
 string noDefectLabel
 )
```

Parameters

projectPath

The path to the Deep Learning project (usually a file with edlproject extension).

roiExtension

The ROI extension in pixels. Default value is 5.

imageName

Override the default image name.

noDefectSamples

Number of extra ROI to be created to represent areas without defect. Default value is 0.

noDefectLabel

The label for the extra ROI (if noDefectSamples>0). Default value is 'NotADefect'.

ESpotDetector.AlignmentArea

Sets/Gets an initial estimate of the rectangle on which spots will be detected in the image. The alignment process is enabled with ESpotDetector::EnableAlignment. To perform the alignment, a tolerance must be set as well, see ESpotDetector::AlignmentTolerance.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERectangle AlignmentArea
  { get; set; }
```

ESpotDetector.AlignmentTolerance

Sets/Gets the tolerance around the initial estimate of the alignment area, in pixels. The default is 100 pixels. See also ESpotDetector::AlignmentArea.

Namespace: Euresys.Open_eVision

[C#]

```
uint AlignmentTolerance
  { get; set; }
```

ESpotDetector.Detect

Performs the spot detection in the given EROIBW8. It returns the number of spot detected. Use ESpotDetector the retrieve the list of detected spots.

Namespace: Euresys.Open_eVision

```
[C#]
uint Detect(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
```

Parameters

sourceImage

The image in which the spots are detected.

ESpotDetector.DLClassifierPath

Opens a DL classifier and use it to classify all further detected spots. The resulting class is stored in ESpot. Use ESpotDetector::UnsetDLClassifier to remove the Deep Learning classification.

Namespace: Euresys.Open_eVision

```
[C#]
string DLClassifierPath
    { get; set; }
```

ESpotDetector.DLExecutionSettings

Controls the execution settings of the DL Classifier. Set the class EDeepLearningExecutionSettings to choose between engines, devices and other inference parameters.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.EDeepLearningExecutionSettings
DLExecutionSettings
    { get; set; }
```

ESpotDetector.Draw

Draw the ESpotDetector.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter drawAdapter,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

drawAdapter

-

color

Color of the drawn rectangle.

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0 (default), the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

graphicContext

-

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ESpotDetector.EnableAlignment

Enables or disables the optional alignment process. The alignment area and the tolerance must be set as well, see ESpotDetector::AlignmentArea and ESpotDetector::AlignmentTolerance.

Namespace: Euresys.Open_eVision

```
[C#]
bool EnableAlignment
  { get; set; }
```

ESpotDetector.ESpotDetector

Constructs an ESpotDetector with default configuration.

Namespace: Euresys.Open_eVision

```
[C#]
void ESpotDetector(
 )
void ESpotDetector(
 Euresys.Open_eVision.ESpotDetector other
 )
```

Parameters

other

-

ESpotDetector.GetDetectionThreshold

Gets the detection threshold for the given spot type.

Namespace: Euresys.Open_eVision

```
[C#]
uint GetDetectionThreshold(
 Euresys.Open_eVision.ESpotType type
 )
```

Parameters

type

The selected spot type as an ESpotType.

ESpotDetector.GetEnableType

Returns the state for the detection of a spot type. See also ESpotDetector::SetEnableType.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetEnableType(
 Euresys.Open_eVision.ESpotType type
 )
```

Parameters

type
The selected spot type as an ESpotType.

ESpotDetector.GetGuardBand

Gets the guard band borders in pixels. See also ESpotDetector::SetGuardBand.

Namespace: Euresys.Open_eVision

```
[C#]
void GetGuardBand(
 ref uint left,
 ref uint right,
 ref uint top,
 ref uint bottom
 )
```

Parameters

left
Size of the left border.

right
Size of the right border.

top
Size of the top border.

bottom
Size of the bottom border.

ESpotDetector.GetMinimumArea

Gets the minimum spot area in pixels.

Namespace: Euresys.Open_eVision

```
[C#]
uint GetMinimumArea(
 Euresys.Open_eVision.ESpotType type
 )
```

Parameters

type

The selected spot type as an ESpotType.

ESpotDetector.GetPolarity

Gets the spot polarity configuration. See also ESpotDetector::SetPolarity.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ESpotPolarity GetPolarity(
 Euresys.Open_eVision.ESpotType type
 )
```

Parameters

type

The selected spot type as an ESpotType.

ESpotDetector.GetSizes

Gets the spot size range configuration.

Namespace: Euresys.Open_eVision

```
[C#]
void GetSizes(
 Euresys.Open_eVision.ESpotType type,
 ref uint first,
 ref uint second
 )
```

Parameters

type

The selected spot type as an ESpotType.

first

First size parameter, depending on the spot type: minimum bbox edge length for Particle, minimum width for Scratch.

second

Second size parameter, depending on the spot type: maximum bbox edge length for Particle, minimum length for Scratch.

ESpotDetector.IsDLClassifierSet

Returns True if a classifier has been loaded.
See also ESpotDetector and ESpotDetector::UnsetDLClassifier.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsDLClassifierSet(
 )
```

ESpotDetector.Load

Loads the ESpotDetector. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
: The file path.

serializer
: The serializer.

ESpotDetector.NumSpots

Gets the number of spots detected by a previous call to ESpotDetector::Detect.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSpots
  { get; }
```

ESpotDetector.operator=

Assignment operator

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ESpotDetector operator=(
 Euresys.Open_eVision.ESpotDetector other
 )
```

Parameters

other

-

ESpotDetector.operator==

Comparison operator

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ESpotDetector other
 )
```

Parameters

other

The other object.

ESpotDetector.Save

Saves the ESpotDetector. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

ESpotDetector.SetDetectionThreshold

Sets the detection threshold. Default: 20 for Particle, 10 for Scratch.

Namespace: Euresys.Open_eVision

```
[C#]
void SetDetectionThreshold(
 Euresys.Open_eVision.ESpotType type,
 uint threshold
 )
```

Parameters

type

The selected spot type as an ESpotType.

threshold

The threshold on the pixel intensity difference with background. A low threshold (5-10) implies a sensitive detection, with possibly a lot of detected spots. A high threshold (30-40) implies a conservative detection, with possible a few or no spot detected.

ESpotDetector.SetEnableType

Enables or disables the detection of a spot type. Default: true for Particle, false for Scratch. See also ESpotDetector::GetEnableType.

Namespace: Euresys.Open_eVision

```
[C#]
void SetEnableType(
 Euresys.Open_eVision.ESpotType type,
 bool state
 )
```

Parameters

type

The selected spot type as an ESpotType.

state

The state of the detection.

ESpotDetector.SetGuardBand

Sets a border, in pixels, to exclude perturbed image data and avoid misdetections near the edges of the alignment area. The default is 0.

Namespace: Euresys.Open_eVision

[C#]

```
void SetGuardBand(
 uint left,
 uint right,
 uint top,
 uint bottom
 )
```

Parameters

left
Size of the left border.

right
Size of the right border.

top
Size of the top border.

bottom
Size of the bottom border.

ESpotDetector.SetMinimumArea

Sets the minimum spot area in pixels. Default: 20 for Particle and 100 for Scratch.

Namespace: Euresys.Open_eVision

[C#]

```
void SetMinimumArea(
 Euresys.Open_eVision.ESpotType type,
 uint area
 )
```

Parameters

type
The selected spot type as an ESpotType.

area
-

ESpotDetector.SetPolarity

Sets the spot polarity configuration. Default: Any for Particle and Scratch.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPolarity(
 Euresys.Open_eVision.ESpotType type,
 Euresys.Open_eVision.ESpotPolarity polarity
 )
```

Parameters

type

The selected spot type as an ESpotType.

polarity

The polarity for the given spot type as an ESpotPolarity.

ESpotDetector.SetSizes

Sets the spot size range configuration. Default: 5 and 64 for Particle, 8 and 256 for Scratch.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSizes(
 Euresys.Open_eVision.ESpotType type,
 uint first,
 uint second
 )
```

Parameters

type

The selected spot type as an ESpotType.

first

First size parameter, depending on the spot type: minimum bbox edge length for Particle, minimum width for Scratch.

second

Second size parameter, depending on the spot type: maximum bbox edge length for Particle, minimum length for Scratch.

ESpotDetector.SourceROI

Gets the last used Region Of Interest, after optionnal alignment and guard band clipping. See also ESpotDetector::EnableAlignment and ESpotDetector::SetGuardBand.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EROIBW8 SourceROI
  { get; }
```

ESpotDetector.Spots

Gets the spots detected by a previous call to ESpotDetector::Detect.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ESpot[] Spots
  { get; }
```

ESpotDetector.UnsetDLClassifier

Disable the usage of the Deep Learning classifier.
Throws an exception if no DL classifier is loaded.
See also ESpotDetector and ESpotDetector::IsDLClassifierSet.

Namespace: Euresys.Open_eVision

[C#]

```
void UnsetDLClassifier(
 )
```

4.238. EStatistics Class

Calculates various statistics on the pixels values of an EDepthMap or EZMap.

Namespace: Euresys.Open_eVision.Easy3D

Methods

ComputeAverageMap	Given an input EDepthMap or EZMap, calculates a depthmap where every pixel is the average of the input DepthMap pixels within a window centered on that pixel.
ComputePixelStatistics	Calculates the minimum, maximum, the average and optionally the standard deviation of the pixels values of an EDepthMap or EZMap. EStatistics::ComputePixelStatistics does not take the resolution of the depthmap into account: it calculates statistics on the pixels gray values.
ComputeStandardDeviationMap	Given an input EDepthMap or EZMap, calculates an image where every pixel is the standard deviation of the input depthmap or ZMap pixels within a window centered on that pixel.

ComputeStatistics	Calculates the minimum, maximum, the average and optionally the standard deviation of an EDepthMap or EZMap values. The standard deviation is optionally calculated. EStatistics::ComputeStatistics takes the resolution of the depthmap or the resolution of the ZMap into account: it calculates statistics on the metric values:

EStatistics.ComputeAverageMap

Given an input EDepthMap or EZMap, calculates a depthmap where every pixel is the average of the input DepthMap pixels within a window centered on that pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ComputeAverageMap(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationMap,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )

void ComputeAverageMap(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationMap,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )

void ComputeAverageMap(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationMap,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )

void ComputeAverageMap(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationMap,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
```

Parameters

sourceMap

The input DepthMap/ZMap.

destinationMap

The destination DepthMap/ZMap. It should have the same dimensions as the input depthmap.

halfKernelSize

The half-size of the window used for the calculation of the standard deviation. The filter window size (= kernel size) is halfKernelSize * 2 + 1, should be positive, smaller than (or equal to) the image size, and may not exceed 256.

minValidRatio

required ratio of valid pixels in the filter window to process the calculation. If not enough, the output pixel will be marked as invalid. The default value of this parameter is 0.25

fillUndefinedPixels

This boolean controls how undefined pixels are handled: either they filled by the calculated average value, or they are left undefined (default behavior).

EStatistics.ComputePixelStatistics

Calculates the minimum, maximum, the average and optionally the standard deviation of the pixels values of an EDepthMap or EZMap.
EStatistics::ComputePixelStatistics does not take the resolution of the depthmap into account: it calculates statistics on the pixels gray values.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average
 )
```

```
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average,
 out float stddev
 )
```

```
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )
```

```
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW8 minimumValue,
 out Euresys.Open_eVision.EBW8 maximumValue,
 out float average,
 out float stddev
 )

void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average,
 out float stddev
 )
```

```
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW16 minimumValue,
 out Euresys.Open_eVision.EBW16 maximumValue,
 out float average,
 out float stddev
 )
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average,
 out float stddev
 )
void ComputePixelStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out Euresys.Open_eVision.EBW32f minimumValue,
 out Euresys.Open_eVision.EBW32f maximumValue,
 out float average,
 out float stddev
 )
```

Parameters

sourceMap
The input DepthMap/ZMap.

validCount
Variable to store the number of valid pixels in sourceMap.

minimumValue
Variable to store the minimum value.

maximumValue
Variable to store the maximum value.

average
Variable to store the average value.

region
The ERegion where the statistics has to be calculated.

stddev
Variable to store the standard deviation.

EStatistics.ComputeStandardDeviationMap

Given an input EDepthMap or EZMap, calculates an image where every pixel is the standard deviation of the input depthmap or ZMap pixels within a window centered on that pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ComputeStandardDeviationMap(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.EImageBW8 destinationImage,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
void ComputeStandardDeviationMap(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 Euresys.Open_eVision.EImageBW16 destinationImage,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
void ComputeStandardDeviationMap(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.EImageBW16 destinationImage,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
void ComputeStandardDeviationMap(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 Euresys.Open_eVision.EImageBW16 destinationImage,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
void ComputeStandardDeviationMap(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.EImageBW8 destinationImage,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
void ComputeStandardDeviationMap(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.EImageBW16 destinationImage,
 short halfKernelSize,
 float minValidRatio,
 bool fillUndefinedPixels
 )
```

Parameters

sourceMap

The input DepthMap/ZMap.

destinationImage

The destination image. It should have the same dimensions as the input depthmap.

halfKernelSize

The half-size of the window used for the calculation of the standard deviation.
The filter window size (= kernel size) is halfKernelSize * 2 + 1, should be positive, smaller than (or equal to) the image size, and may not exceed 256.

minValidRatio

required ratio of valid pixels in the filter window to process the calculation.
If not enough, the output pixel value will be 0. The default value of this parameter is 0.25 .

fillUndefinedPixels

This boolean controls how undefined pixels are handled: either they filled by the calculated standard deviation, or they are left undefined (default behavior).

Remarks

When the input depthmap is on 8 bits and the destination image is on 16 bits, the resulting standard deviation scale is 256 times larger than in the source depthmap.

EStatistics.ComputeStatistics

Calculates the minimum, maximum, the average and optionally the standard deviation of an EDepthMap or EZMap values.
The standard deviation is optionally calculated. EStatistics::ComputeStatistics takes the resolution of the depthmap or the resolution of the ZMap into account: it calculates statistics on the metric values:

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )
```

```
void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )
```

```
void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )
```

```
void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )
```

```
void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )

void ComputeStatistics(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceMap,
 Euresys.Open_eVision.ERegion region,
 out uint validCount,
 out float minimumValue,
 out float maximumValue,
 out float average,
 out float stddev
 )
```

Parameters

sourceMap
The input DepthMap/ZMap.
validCount
Variable to store the number of valid pixels in sourceMap.
minimumValue
Variable to store the minimum value.
maximumValue
Variable to store the maximum value.
average
Variable to store the average value.
region
The ERegion where the statistics has to be calculated.
stddev
Variable to store the standard deviation value.

4.239. EStringPair Class

Represent a Key/Value pair of strings.

Namespace: Euresys.Open_eVision

Properties

Key	Returns the key.
Value	Returns the value.

Methods

EStringPair	Constructs an EStringPair context.
operator=	Assignment operator

EStringPair.EStringPair

Constructs an EStringPair context.

Namespace: Euresys.Open_eVision

[C#]

```
void EStringPair(
 string key,
 string value
 )
```

```
void EStringPair(
 Euresys.Open_eVision.EStringPair other
 )
```

Parameters

key
The key.

value
The value associated to the key.

other
-

EStringPair.Key

Returns the key.

Namespace: Euresys.Open_eVision

[C#]

```
string Key
  { get; }
```

EStringPair.operator=

Assignment operator

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EStringPair operator=(
 Euresys.Open_eVision.EStringPair other
 )
```

Parameters

other
-

EStringPair.Value

Returns the value.

Namespace: Euresys.Open_eVision

```
[C#]
string Value
  { get; }
```

4.240. ESupervisedSegmenter Class

Supervised segmentation tool.

The supervised segmentation tool segments the pixels of an image into various labels by learning a deep learning model on a dataset of segmented images.
The tool can work with images of any resolution higher than ESupervisedSegmenter::PatchSize by merging the results obtained by applying the deep neural network using a sliding window algorithm. The overlap between the sliding windows is controled by ESupervisedSegmenter::SamplingDensity.
For defect detection/foreground blobs detection, the supervised segmenter offers a tradeoff between a high good detection rate and a high defect detection rate through a classification threshold that can be configured after training (ESupervisedSegmenter::ClassificationThreshold).

Base Class:EDeepLearningTool

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Capacity	Capacity of the ESupervisedSegmenter. A higher capacity makes the supervised segmenter capable of learning more information at the cost of a slower processing speed.
ClassificationThreshold	Classification threshold for determining whether an image contains blobs with a label different than background. By default, its value is set during training to maximize the weighted accuracy (see ESupervisedSegmenterMetrics).
ForceGrayscale	Forces the ESupervisedSegmenter to convert all images to grayscale (default: false). Setting this property to false will make the underlying neural network operates with the same number of channels as the images in the dataset used for training. Otherwise, color images will be converted to grayscale before using them.
InferenceScale	The effective scale applied when performing inference. If ESupervisedSegmenter::ScaleDisabledAtInference is true, it is equal to 1.0. Otherwise, it is equal to ESupervisedSegmenter::Scale.
PatchSize	Patch size (width and height of the patches processed by the neural network).

SamplingDensity	Sampling density (default value: 1.25, its value must be equal or greater than 1). The sampling density is the parameter of the sliding window algorithm used for processing a whole image using subwindows of size ESupervisedSegmenter::PatchSize. It indicates how much overlap there will be between the image patches: the stride between two consecutive patches is ESupervisedSegmenter::PatchSize / ESupervisedSegmenter::SamplingDensity.
Scale	Down-scaling applied to images before processing them. Its value is between 0 and 1 (default value: 1).
ScaleDisabledAtInference	Whether to apply the scale parameter at inference or not. If you disable the scale at inference, make sure your images are already scaled. For example, if you trained with images of 1024x1024 and a scale of 0.5, the inference images should be 512 x 512 images with the same field of view as the training images.
ToolType	Type of the deep learning tool.

Methods

Apply	Applies the unsupervised segmenter on the given image and its mask region. We recommend to use pointer-based versions of this method to avoid unnecessary image and result copies.
ESupervisedSegmenter	Constructs a ESupervisedSegmenter object.
Evaluate	Evaluates the dataset.
GetNumPatchesForImage	Number of patches that will be extracted from an input image to perform inference. For EasyClassify and EasyLocate, this will always be equal to 1. For EasySegment, the number of patches will depend on the scale, patch size and sampling density parameters.
GetTrainingMetrics	Training metrics at the given iteration
GetValidationMetrics	Validation metrics at the given iteration
operator=	Assignment operator
SerializeSettings	Serializes the settings of the supervised segmenter.

ESupervisedSegmenter.Apply

Applies the unsupervised segmenter on the given image and its mask region.
We recommend to use pointer-based versions of this method to avoid unnecessary image and result copies.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult Apply(
 Euresys.Open_eVision.EBaseROI img
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult Apply(
 Euresys.Open_eVision.EBaseROI img,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW8[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW8[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW16[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW16[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageC24[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageC24[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

void Apply(
 Euresys.Open_eVision.EBaseROI[] imgs,
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] results
 )

void Apply(
 Euresys.Open_eVision.EBaseROI[] imgs,
 Euresys.Open_eVision.ERegion[] masks,
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult[] results
 )
```

Parameters

img
Image to classify and segment defects in.

mask
Mask region of the image.

imgs
Vector of image to classify and segment defects in.

masks
Vector of mask regions for the images.

results
-

ESupervisedSegmenter.Capacity

Capacity of the ESupervisedSegmenter.
A higher capacity makes the supervised segmenter capable of learning more information at the cost of a slower processing speed.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterCapacity Capacity
  { get; set; }
```

ESupervisedSegmenter.ClassificationThreshold

Classification threshold for determining whether an image contains blobs with a label different than background.
By default, its value is set during training to maximize the weighted accuracy (see ESupervisedSegmenterMetrics).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float ClassificationThreshold
  { get; set; }
```

ESupervisedSegmenter.ESupervisedSegmenter

Constructs a ESupervisedSegmenter object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void ESupervisedSegmenter(
 )
void ESupervisedSegmenter(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenter other
 )
```

Parameters

other

Reference to the ESupervisedSegmenter object that should be copied

ESupervisedSegmenter.Evaluate

Evaluates the dataset.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics Evaluate(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

dataset

Dataset to evaluate

ESupervisedSegmenter.ForceGrayscale

Forces the ESupervisedSegmenter to convert all images to grayscale (default: false).
Setting this property to false will make the underlying neural network operates with the same number of channels as the images in the dataset used for training. Otherwise, color images will be converted to grayscale before using them.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool ForceGrayscale
  { get; set; }
```

ESupervisedSegmenter.GetNumPatchesForImage

Number of patches that will be extracted from an input image to perform inference.
For EasyClassify and EasyLocate, this will always be equal to 1.
For EasySegment, the number of patches will depend on the scale, patch size and sampling density parameters.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int GetNumPatchesForImage(
 int imageWidth,
 int imageHeight
 )
```

Parameters

imageWidth

Width of the image for which to get the number of patch

imageHeight

Height of the image for which to get the number of patch

ESupervisedSegmenter.GetTrainingMetrics

Training metrics at the given iteration

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics GetTrainingMetrics(
 int iteration
 )
```

Parameters

iteration

Iteration at which to get the metrics

ESupervisedSegmenter.GetValidationMetrics

Validation metrics at the given iteration

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics GetValidationMetrics(
 int iteration
 )
```

Parameters

iteration

Iteration at which to get the metrics

ESupervisedSegmenter.InferenceScale

The effective scale applied when performing inference.
If ESupervisedSegmenter::ScaleDisabledAtInference is true, it is equal to 1.0. Otherwise, it is equal to ESupervisedSegmenter::Scale.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float InferenceScale
  { get; }
```

ESupervisedSegmenter.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenter operator=(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenter other
 )
```

Parameters

other

Reference to the ESupervisedSegmenter object that should be copied

ESupervisedSegmenter.PatchSize

Patch size (width and height of the patches processed by the neural network).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int PatchSize
  { get; set; }
```

Remarks

There are three supported patch size: 64x64, 128x128, and 256x256. By default, the patch size is 0 and it means that the patch size will be 128x128 if all images in the training and validation dataset have a higher resolution or the patch size will be 64x64.

ESupervisedSegmenter.SamplingDensity

Sampling density (default value: 1.25, its value must be equal or greater than 1).
The sampling density is the parameter of the sliding window algorithm used for processing a whole image using subwindows of size ESupervisedSegmenter::PatchSize. It indicates how much overlap there will be between the image patches: the stride between two consecutive patches is ESupervisedSegmenter::PatchSize / ESupervisedSegmenter::SamplingDensity.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SamplingDensity
  { get; set; }
```

ESupervisedSegmenter.Scale

Down-scaling applied to images before processing them. Its value is between 0 and 1 (default value: 1).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Scale
  { get; set; }
```

ESupervisedSegmenter.ScaleDisabledAtInference

Whether to apply the scale parameter at inference or not.
If you disable the scale at inference, make sure your images are already scaled. For example, if you trained with images of 1024x1024 and a scale of 0.5, the inference images should be 512 x 512 images with the same field of view as the training images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool ScaleDisabledAtInference
  { get; set; }
```

ESupervisedSegmenter.SerializeSettings

Serializes the settings of the supervised segmenter.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

ESupervisedSegmenter.ToolType

Type of the deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
override Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType ToolType
  { get; }
```

4.241. ESupervisedSegmenterBlob Class

A blob detected by a supervised segmentation tool (see ESupervisedSegmenter and ESupervisedSegmenterResult).
A blob is a connected component from a label that is not the "Background" label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Area	Area of the blob in pixels.
AverageBackgroundProbability	Average probability of the background label (ESupervisedSegmenterBlob::Label) in the blob.
AverageProbability	Average probability of the predicted label (ESupervisedSegmenterBlob::Label) in the blob.
Label	Label of the blob.
MaxBackgroundProbability	Maximum probability of the background label (ESupervisedSegmenterBlob::Label) in the blob.
MaxProbability	Maximum probability of the predicted label (ESupervisedSegmenterBlob::Label) in the blob.
MinBackgroundProbability	Minimum probability of the background label (ESupervisedSegmenterBlob::Label) in the blob.
MinProbability	Minimum probability of the predicted label (ESupervisedSegmenterBlob::Label) in the blob.

Region	Region of the blob.

Methods

ESupervisedSegmenterBlob	Copy constructor of an ESupervisedSegmenterBlob object.
operator=	Assignment operator

ESupervisedSegmenterBlob.Area

Area of the blob in pixels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int Area
  { get; }
```

ESupervisedSegmenterBlob.AverageBackgroundProbability

Average probability of the background label (ESupervisedSegmenterBlob::Label) in the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AverageBackgroundProbability
  { get; }
```

ESupervisedSegmenterBlob.AverageProbability

Average probability of the predicted label (ESupervisedSegmenterBlob::Label) in the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AverageProbability
  { get; }
```

ESupervisedSegmenterBlob.ESupervisedSegmenterBlob

Copy constructor of an ESupervisedSegmenterBlob object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ESupervisedSegmenterBlob(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterBlob other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterBlob object that should be copied

ESupervisedSegmenterBlob.Label

Label of the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string Label
  { get; }
```

ESupervisedSegmenterBlob.MaxBackgroundProbability

Maximum probability of the background label (ESupervisedSegmenterBlob::Label) in the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxBackgroundProbability
  { get; }
```

ESupervisedSegmenterBlob.MaxProbability

Maximum probability of the predicted label (ESupervisedSegmenterBlob::Label) in the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MaxProbability
  { get; }
```

ESupervisedSegmenterBlob.MinBackgroundProbability

Minimum probability of the background label (ESupervisedSegmenterBlob::Label) in the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinBackgroundProbability
  { get; }
```

ESupervisedSegmenterBlob.MinProbability

Minimum probability of the predicted label (ESupervisedSegmenterBlob::Label) in the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float MinProbability
  { get; }
```

ESupervisedSegmenterBlob.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterBlob operator=(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterBlob other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterBlob object used for the assignment

ESupervisedSegmenterBlob.Region

Region of the blob.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.ERegion Region
  { get; }
```

4.242. ESupervisedSegmenterMetrics Class

Collection of metrics used to evaluate the state of a ESupervisedSegmenter tool.
A metric is a value summarizing the quality of a collection of supervised segmentation results (see ESupervisedSegmenterResult) with respect to their ground truth.
New results can be added to the object individually with ESupervisedSegmenterMetrics.

The ESupervisedSegmenterMetrics contains three types of metrics:
- pixel based metrics that are related to the quality of the segmentation masks
- blob based metrics that are related to the ability of the supervised segmentation tool to detect foreground blobs
- defect detection metrics that are related to the ability of the supervised segmentation tool to differentiate between images that contains foreground pixels (defective images) and images that are entirely background (good images).

The pixel metrics are the error (see ESupervisedSegmenterMetrics::Error), the pixel accuracy (see ESupervisedSegmenterMetrics::PixelAccuracy), the pixel confusion (see ESupervisedSegmenterMetrics::GetPixelConfusion), the pixel per-label accuracy (see ESupervisedSegmenterMetrics::GetPixelLabelAccuracy) and the intersection over union (see ESupervisedSegmenterMetrics).
The blob based metrics are two confusion matrixes (ESupervisedSegmenterMetrics::GetGroundtruthBlobConfusion and ESupervisedSegmenterMetrics::GetPredictedBlobConfusion), and various defect detection metrics (ESupervisedSegmenterMetrics, ESupervisedSegmenterMetrics, and ESupervisedSegmenterMetrics). Note that the metrics for defective blob detection are different from the metrics for defective image detection because, in the case of blob detection, we have no "good" ground truth results.
See EDeepLearningDefectDetectionMetrics for a description of the defect detection metrics. These metrics are available when EDeepLearningDefectDetectionMetrics::IsDefectDetectionMetricsValid is true, i.e. when both images that are entirely background and images with non-background pixels have been added to the metrics.
Most metrics depends upon the ESupervisedSegmenterMetrics.

Base Class:EDeepLearningDefectDetectionMetrics

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

BalancedError	Balanced error. The balanced error is the weighted error (ESupervisedSegmenterMetrics) where each label is given an equal weight.
BalancedIntersectionOverUnion	Balanced Intersection over Union (IoU). The balanced interesection over union is the weighted intersection over union (ESupervisedSegmenterMetrics::WeightedIntersectionOverUnion) where each label is given equal weight.

BalancedPixelAccuracy	Balanced accuracy. The balanced accuracy is the weighted accuracy (ESupervisedSegmenterMetrics::WeightedPixelAccuracy) where each label is given an equal weight.
BlobDetectionAveragePrecision	Average precision for blob detection. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label. The average precision for blob detection is the average of the precision (see ESupervisedSegmenterMetrics) over all the possible classification threshold values. As such, the average precision does not depend on a specific classification threshold.
BlobDetectionBestFScore	Best F1-Score of the segmenter for blob detection. See ESupervisedSegmenterMetrics::BlobDetectionBestFScoreThreshold for the corresponding threshold. See EDeepLearningDefectDetectionMetrics for a definition of the F1-Score. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.
BlobDetectionBestFScoreThreshold	Classification threshold that achieves the best F1-Score for blob detection. See ESupervisedSegmenterMetrics::BlobDetectionBestFScore for the corresponding F1-Score. See EDeepLearningDefectDetectionMetrics for a definition of the F1-Score. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.
BlobDetectionFScore	F1-Score for defective blob detection given the current classification threshold (see EDeepLearningDefectDetectionMetrics::ClassificationThreshold). See ESupervisedSegmenterMetrics for the corresponding F1-Score. See EDeepLearningDefectDetectionMetrics for a definition of the F1-Score. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.
BlobDetectionPrecision	Precision for blob detection given the current classification threshold (see EDeepLearningDefectDetectionMetrics::ClassificationThreshold). The precision is the proportion of detected defective blobs that match ground truth defective blobs. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.
BlobDetectionRecall	Recall for blob detection given the current classification threshold (see EDeepLearningDefectDetectionMetrics::ClassificationThreshold). The recall is the proportion of ground truth defective blobs that are matched to predicted defective blobs. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.
Error	Error.
NumLabels	Number of labels recognized by the segmenter that produced the results aggregated in the metrics.

PixelAccuracy	Accuracy. The accuracy is the ratio of the number of correctly classified pixels to the total number of pixels.
WeightedError	Weighted error. The weighted error is the weighted average of each label error (ESupervisedSegmenterMetrics::GetLabelError) with respect to the dataset label weights.
WeightedIntersectionOverUnion	Weighted Intersection over Union (IoU). The weighted interesection over union is the weighted averaged of each label intersection over union (see ESupervisedSegmenterMetrics::GetIntersectionOverUnion) with respect to the dataset label weights.
WeightedPixelAccuracy	Weighted accuracy. The weighted accuracy is the weighted average of each label accuracy (ESupervisedSegmenterMetrics::GetPixelLabelAccuracy) with respect to the dataset label weights.

Methods

ESupervisedSegmenterMetrics	Constructs an ESupervisedSegmenterMetrics object.
GetGroundtruthBlobConfusion	Number of ground truth blobs of the given ground truth label that best match with blobs of the given precited label. See ESupervisedSegmenterMetrics::GetPredictedBlobConfusion for the number of predicted blobs that match to these ground truth blobs.
GetIntersectionOverUnion	Intersection over union. The intersection over union if the ratio between the number of correctly classified pixels from the given label to the total number of pixels that belongs to that label or are predicted as being from that label. Assuming that the given label is the positive class, the intersection over union is expressed as IOU = TP / (TP + FP + FN) where TP is the number of true positive, FP the number of false positive (pixels that belongs to label but are not predicted as label) and FN the number of false negative (pixels predicted as label but that do not belong to label).
GetLabel	Label recognized by the segmenter that produced the results aggregated in the metrics.
GetLabelError	Label error.
GetNormalizedPixelConfusion	Pixel-wise normalized confusion between the given true and predicted labels. The normalized confusion is the ratio of the number of pixels belonging to the 'trueLabel' that are classified as 'predictedLabel' to the total number of pixels belonging to the 'trueLabel'.
GetPixelConfusion	Pixel-wise confusion between the given true and predicted labels. The confusion is the number of pixels belonging to the 'trueLabel' that are classified as 'predictedLabel'.

GetPixelLabelAccuracy	Pixel label accuracy. The label accuracy is the ratio of the number of correctly classified pixels of the given class to the total number of ground truth pixels from that class. If there are no ground truth pixels from the requested label, the method returns '-1'.
GetPredictedBlobConfusion	Number of predicted blobs of the given precited label that match to blobs of the given ground truth label. See ESupervisedSegmenterMetrics::GetGroundtruthBlobConfusion for the number of ground truth blobs that match to these predicted blobs.
IsValid	Indicates whether the object contains at least one result.
Load	Loads an supervised segmentation metric. The given ESerializer must have been created for reading.
operator=	Assignment operator.
operator==	Equality operator.
Save	Saves an supervised segmentation metric. The given ESerializer must have been created for writing.

ESupervisedSegmenterMetrics.BalancedError

Balanced error.
The balanced error is the weighted error (ESupervisedSegmenterMetrics) where each label is given an equal weight.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float BalancedError
  { get; }
```

Remarks

The error is also called the cross-entropy loss.

ESupervisedSegmenterMetrics.BalancedIntersectionOverUnion

Balanced Intersection over Union (IoU).
The balanced interesection over union is the weighted intersection over union (ESupervisedSegmenterMetrics::WeightedIntersectionOverUnion) where each label is given equal weight.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float BalancedIntersectionOverUnion
  { get; }
```

ESupervisedSegmenterMetrics.BalancedPixelAccuracy

Balanced accuracy.
The balanced accuracy is the weighted accuracy (ESupervisedSegmenterMetrics::WeightedPixelAccuracy) where each label is given an equal weight.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BalancedPixelAccuracy
  { get; }
```

ESupervisedSegmenterMetrics.BlobDetectionAveragePrecision

Average precision for blob detection.
Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label. The average precision for blob detection is the average of the precision (see ESupervisedSegmenterMetrics) over all the possible classification threshold values. As such, the average precision does not depend on a specific classification threshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BlobDetectionAveragePrecision
  { get; }
```

ESupervisedSegmenterMetrics.BlobDetectionBestFScore

Best F1-Score of the segmenter for blob detection.
See ESupervisedSegmenterMetrics::BlobDetectionBestFScoreThreshold for the corresponding threshold.
See EDeepLearningDefectDetectionMetrics for a definition of the F1-Score. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BlobDetectionBestFScore
  { get; }
```

ESupervisedSegmenterMetrics.BlobDetectionBestFScoreThreshold

Classification threshold that achieves the best F1-Score for blob detection.
See ESupervisedSegmenterMetrics::BlobDetectionBestFScore for the corresponding F1-Score.
See EDeepLearningDefectDetectionMetrics for a definition of the F1-Score. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BlobDetectionBestFScoreThreshold
  { get; }
```

ESupervisedSegmenterMetrics.BlobDetectionFScore

F1-Score for defective blob detection given the current classification threshold (see EDeepLearningDefectDetectionMetrics::ClassificationThreshold).
See ESupervisedSegmenterMetrics for the corresponding F1-Score.
See EDeepLearningDefectDetectionMetrics for a definition of the F1-Score. Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BlobDetectionFScore
  { get; }
```

ESupervisedSegmenterMetrics.BlobDetectionPrecision

Precision for blob detection given the current classification threshold (see EDeepLearningDefectDetectionMetrics::ClassificationThreshold).
The precision is the proportion of detected defective blobs that match ground truth defective blobs.
Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BlobDetectionPrecision
  { get; }
```

ESupervisedSegmenterMetrics.BlobDetectionRecall

Recall for blob detection given the current classification threshold (see EDeepLearningDefectDetectionMetrics::ClassificationThreshold).
The recall is the proportion of ground truth defective blobs that are matched to predicted defective blobs.
Blob detection is the ability of the segmenter to correctly detect foreground ground truth blobs, regardless of their specific label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float BlobDetectionRecall
  { get; }
```

ESupervisedSegmenterMetrics.Error

Error.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Error
  { get; }
```

Remarks

The error is also called the cross-entropy loss.

ESupervisedSegmenterMetrics.ESupervisedSegmenterMetrics

Constructs an ESupervisedSegmenterMetrics object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void ESupervisedSegmenterMetrics(
 )
void ESupervisedSegmenterMetrics(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterMetrics object that should be copied

ESupervisedSegmenterMetrics.GetGroundtruthBlobConfusion

Number of ground truth blobs of the given ground truth label that best match with blobs of the given precited label.
See ESupervisedSegmenterMetrics::GetPredictedBlobConfusion for the number of predicted blobs that match to these ground truth blobs.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.UInt64 GetGroundtruthBlobConfusion(
 string groundtruthLabel,
 string predictedLabel
 )
System.UInt64 GetGroundtruthBlobConfusion(
 int groundtruthLabelIndex,
 int predictedLabelIndex
 )
```

Parameters

groundtruthLabel
Ground truth label

predictedLabel
Predicted label

groundtruthLabelIndex
Ground truth label index

predictedLabelIndex
Predicted label index

Remarks

A ground truth blob is matched to the subset of predicted blobs from the same predicted label that has the best intersection over union with the ground truth blob. Otherwise, the ground truth blob is matched to background.

ESupervisedSegmenterMetrics.GetIntersectionOverUnion

Intersection over union.
The intersection over union if the ratio between the number of correctly classified pixels from the given label to the total number of pixels that belongs to that label or are predicted as being from that label.
Assuming that the given label is the positive class, the intersection over union is expressed as IOU = TP / (TP + FP + FN) where TP is the number of true positive, FP the number of false positive (pixels that belongs to label but are not predicted as label) and FN the number of false negative (pixels predicted as label but that do not belong to label).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetIntersectionOverUnion(
 string label
 )
```

Parameters

label

Label

Remarks

The intersection over union is also called the Jaccard index.

ESupervisedSegmenterMetrics.GetLabel

Label recognized by the segmenter that produced the results aggregated in the metrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
string GetLabel(
 int labelIdx
 )
```

Parameters

labelIdx

Index of the label between 0 and ESupervisedSegmenterMetrics::NumLabels - 1.

ESupervisedSegmenterMetrics.GetLabelError

Label error.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetLabelError(
 string label
 )
```

Parameters

label

Label

ESupervisedSegmenterMetrics.GetNormalizedPixelConfusion

Pixel-wise normalized confusion between the given true and predicted labels.
The normalized confusion is the ratio of the number of pixels belonging to the 'trueLabel' that are classified as 'predictedLabel' to the total number of pixels belonging to the 'trueLabel'.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetNormalizedPixelConfusion(
 string trueLabel,
 string predictedLabel
 )
```

Parameters

trueLabel
True label

predictedLabel
Predicted label

ESupervisedSegmenterMetrics.GetPixelConfusion

Pixel-wise confusion between the given true and predicted labels.
The confusion is the number of pixels belonging to the 'trueLabel' that are classified as 'predictedLabel'.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.UInt64 GetPixelConfusion(
 string trueLabel,
 string predictedLabel
 )
```

Parameters

trueLabel
True label

predictedLabel
Predicted label

ESupervisedSegmenterMetrics.GetPixelLabelAccuracy

Pixel label accuracy.
The label accuracy is the ratio of the number of correctly classified pixels of the given class to the total number of ground truth pixels from that class. If there are no ground truth pixels from the requested label, the method returns '-1'.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float GetPixelLabelAccuracy(
 string label
 )
```

Parameters

label

Label

ESupervisedSegmenterMetrics.GetPredictedBlobConfusion

Number of predicted blobs of the given precited label that match to blobs of the given ground truth label.
See ESupervisedSegmenterMetrics::GetGroundtruthBlobConfusion for the number of ground truth blobs that match to these predicted blobs.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
System.UInt64 GetPredictedBlobConfusion(
 string groundtruthLabel,
 string predictedLabel
 )

System.UInt64 GetPredictedBlobConfusion(
 int groundtruthLabelIndex,
 int predictedLabelIndex
 )
```

Parameters

groundtruthLabel

Ground truth label

predictedLabel

Predicted label

groundtruthLabelIndex

Ground truth label index

predictedLabelIndex

Predicted label index

Remarks

A predicted blob may be counted several times in the confusion matrix for predicted blobs:
- Once if the more than 50% of the blob intersects ground truth background.
- Once for each non-background label the predicted blob has an intersection with.

ESupervisedSegmenterMetrics.IsValid

Indicates whether the object contains at least one result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

ESupervisedSegmenterMetrics.Load

Loads an supervised segmentation metric. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ESupervisedSegmenterMetrics.NumLabels

Number of labels recognized by the segmenter that produced the results aggregated in the metrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLabels
  { get; }
```

ESupervisedSegmenterMetrics.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics operator=(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterMetrics object used for the assignment

ESupervisedSegmenterMetrics.operator==

Equality operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool operator==(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterMetrics object

ESupervisedSegmenterMetrics.PixelAccuracy

Accuracy.
The accuracy is the ratio of the number of correctly classified pixels to the total number of pixels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float PixelAccuracy
  { get; }
```

Remarks

The accuracy will be skewed towards the most represented labels in the dataset. For example, if your dataset has 1% of defective pixels, the accuracy will mostly reflect the results on the 99% of good pixels and will say nothing about the capability of the model to detect the defect labels.

ESupervisedSegmenterMetrics.Save

Saves an supervised segmentation metric. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ESupervisedSegmenterMetrics.WeightedError

Weighted error.
The weighted error is the weighted average of each label error (ESupervisedSegmenterMetrics::GetLabelError) with respect to the dataset label weights.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float WeightedError
  { get; }
```

Remarks

The error is also called the cross-entropy loss.

ESupervisedSegmenterMetrics.WeightedIntersectionOverUnion

Weighted Intersection over Union (IoU).
The weighted interesection over union is the weighted averaged of each label intersection over union (see ESupervisedSegmenterMetrics::GetIntersectionOverUnion) with respect to the dataset label weights.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float WeightedIntersectionOverUnion
  { get; }
```

ESupervisedSegmenterMetrics.WeightedPixelAccuracy

Weighted accuracy.
The weighted accuracy is the weighted average of each label accuracy (ESupervisedSegmenterMetrics::GetPixelLabelAccuracy) with respect to the dataset label weights.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float WeightedPixelAccuracy
  { get; }
```

4.243. ESupervisedSegmenterResult Class

An ESupervisedSegmenterResult object represents the result of a supervised segmentater.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

ClassificationThreshold	Classification threshold for determining whether the image contains blobs with a label different than background. By default, its value is given by the supervised segmenter that produced this result.
ColorizedSegmentation	Colorized version of the segmentation map.
ColorizedSegmentationWithTransparency	Colorized version of the segmentation map with transparency.
GroundtruthSegmentationMap	Ground truth segmentation map. By default, the ground truth segmentation map is all background.
Height	Height of the source image and of the segmentation result.
ImageMetrics	Metrics for the image. You must set the ESupervisedSegmenterResult::GroundtruthSegmentationMap before accessing this field.
NumLabels	Number of segmentation labels of the supervised segmenter that produced this result.
Score	Score used to determine whether the result contains segments that are not background.

SegmentationMap	Segmentation result.
Width	Width of the source image and of the segmentation result.

Methods

Draw	Draws the segmentation. The detected segment are drawn with the label color specified in the dataset used for training. The pixel classified as background are transparent.
ESupervisedSegmenterResult	Constructs a non-valid ESupervisedSegmenterResult.
GetBlobs	Detected blobs for all labels or for the specified label.
GetLabel	Label at the given index.
GetLabelColor	Color of a label.
GetNumBlobs	Number of detected blobs for all labels or for the specified label.
GetProbabilityMap	Probability map for the given label. The probability values are mapped between 0 and 255.
GetRegionForLabel	Region corresponding to the given label.
HasForegroundSegments	Whether the predicted segmnetation contains non-background pixels.
HasGroundtruthSegmentation	Whether the result is associated with a ground truth segmentation map.
IsValid	Indicates whether the result is valid and ready to be used. A default contructed ESupervisedSegmenterResult is not valid.
operator=	Assignment operator
RemoveGroundtruthSegmentation	Removes any ground truth associated with the result.

ESupervisedSegmenterResult.ClassificationThreshold

Classification threshold for determining whether the image contains blobs with a label different than background.
By default, its value is given by the supervised segmenter that produced this result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float ClassificationThreshold
  { get; set; }
```

ESupervisedSegmenterResult.ColorizedSegmentation

Colorized version of the segmentation map.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EImageC24 ColorizedSegmentation
  { get; }
```

ESupervisedSegmenterResult.ColorizedSegmentationWithTransparency

Colorized version of the segmentation map with transparency.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EImageC24A ColorizedSegmentationWithTransparency
  { get; }
```

ESupervisedSegmenterResult.Draw

Draws the segmentation.
The detected segment are drawn with the label color specified in the dataset used for training. The pixel classified as background are transparent.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

-

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

ESupervisedSegmenterResult.ESupervisedSegmenterResult

Constructs a non-valid ESupervisedSegmenterResult.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void ESupervisedSegmenterResult(
 )
void ESupervisedSegmenterResult(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterResult object that should be copied

ESupervisedSegmenterResult.GetBlobs

Detected blobs for all labels or for the specified label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterBlob[] GetBlobs(
 )
```

```
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterBlob[] GetBlobs(
 string label
 )
```

Parameters

label

Label

Remarks

A blob is a contiguous set of pixels detected to be of the same non-background label. As such, the "background" label never has blobs. The set of detected blobs depends on the threshold.

ESupervisedSegmenterResult.GetLabel

Label at the given index.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GetLabel(
 int labelIndex
 )
```

Parameters

labelIndex

Index of the label

Remarks

The index must be comprised between 0 and ESupervisedSegmenterResult::NumLabels - 1. The labels are the one from the supervised segmenter that produced this result.

ESupervisedSegmenterResult.GetLabelColor

Color of a label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.ERGBColor GetLabelColor(
 int i
 )

Euresys.Open_eVision.ERGBColor GetLabelColor(
 string label
 )
```

Parameters

i

Index of the label for which to get the color (between 0 and ESupervisedSegmenterResult::NumLabels - 1)

label

Label for which to get the color

Remarks

The label color is controlled at the tool level. To change a color in a result, change the label color in the tool.

ESupervisedSegmenterResult.GetNumBlobs

Number of detected blobs for all labels or for the specified label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int GetNumBlobs(
 string label
 )
int GetNumBlobs(
 )
```

Parameters

label

Label

Remarks

A blob is a contiguous set of pixels detected to be of the same non-background label. As such, the "background" label never has blobs.

ESupervisedSegmenterResult.GetProbabilityMap

Probability map for the given label.
The probability values are mapped between 0 and 255.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EImageBW8 GetProbabilityMap(
 string label
 )
```

Parameters

label

Label

ESupervisedSegmenterResult.GetRegionForLabel

Region corresponding to the given label.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.ERegion GetRegionForLabel(
 string label
 )
```

Parameters

label

Label

ESupervisedSegmenterResult.GroundtruthSegmentationMap

Ground truth segmentation map.
By default, the ground truth segmentation map is all background.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EImageBW16 GroundtruthSegmentationMap
  { get; set; }
```

ESupervisedSegmenterResult.HasForegroundSegments

Whether the predicted segmnetation contains non-background pixels.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasForegroundSegments(
 )
```

ESupervisedSegmenterResult.HasGroundtruthSegmentation

Whether the result is associated with a ground truth segmentation map.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool HasGroundtruthSegmentation(
 )
```

ESupervisedSegmenterResult.Height

Height of the source image and of the segmentation result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int Height
  { get; }
```

ESupervisedSegmenterResult.ImageMetrics

Metrics for the image.
You must set the ESupervisedSegmenterResult::GroundtruthSegmentationMap before accessing this field.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterMetrics ImageMetrics
  { get; }
```

ESupervisedSegmenterResult.IsValid

Indicates whether the result is valid and ready to be used.
A default contructed ESupervisedSegmenterResult is not valid.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsValid(
 )
```

ESupervisedSegmenterResult.NumLabels

Number of segmentation labels of the supervised segmenter that produced this result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int NumLabels
  { get; }
```

ESupervisedSegmenterResult.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult operator=(
 Euresys.Open_eVision.EasyDeepLearning.ESupervisedSegmenterResult other
 )
```

Parameters

other

Reference to the ESupervisedSegmenterResult object used for the assignment

ESupervisedSegmenterResult.RemoveGroundtruthSegmentation

Removes any ground truth associated with the result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void RemoveGroundtruthSegmentation(
 )
```

ESupervisedSegmenterResult.Score

Score used to determine whether the result contains segments that are not background.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Score
  { get; }
```

ESupervisedSegmenterResult.SegmentationMap

Segmentation result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EImageBW16 SegmentationMap
  { get; }
```

ESupervisedSegmenterResult.Width

Width of the source image and of the segmentation result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int Width
  { get; }
```

4.244. EThreeLayersImageSegmenter Class

The base class from which all the segmenters that produce three layers derive.

Remarks

The Layer Encoding can be enabled/disabled for each layer individually. The index of the layers in the coded image can also be assigned individually.

Base Class:EImageSegmenter

Derived Class(es):EGrayscaleDoubleThresholdSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

BlackLayerEncoded	Black layer encoding status.
BlackLayerIndex	Index of the black layer in the destination coded image.
NeutralLayerEncoded	Neutral layer encoding status.
NeutralLayerIndex	Index of the neutral layer in the destination coded image.
WhiteLayerEncoded	White layer encoding status.
WhiteLayerIndex	Index of the white layer in the destination coded image.

Methods

Load	Load the EThreeLayersImageSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the EThreeLayersImageSegmenter configuration. The given ESerializer must have been created for writing.

EThreeLayersImageSegmenter.BlackLayerEncoded

Black layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
virtual bool BlackLayerEncoded
  { get; set; }
```

EThreeLayersImageSegmenter.BlackLayerIndex

Index of the black layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
virtual uint BlackLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the black layer.

EThreeLayersImageSegmenter.Load

Load the EThreeLayersImageSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EThreeLayersImageSegmenter.NeutralLayerEncoded

Neutral layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
virtual bool NeutralLayerEncoded
  { get; set; }
```

EThreeLayersImageSegmenter.NeutralLayerIndex

Index of the neutral layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
virtual uint NeutralLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the neutral layer.

EThreeLayersImageSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
bool operator==(
 Euresys.Open_eVision.Segmenters.EThreeLayersImageSegmenter other
 )
```

Parameters

other

Other segmenter to compare to.

EThreeLayersImageSegmenter.Save

Save the EThreeLayersImageSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EThreeLayersImageSegmenter.WhiteLayerEncoded

White layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
virtual bool WhiteLayerEncoded
  { get; set; }
```

EThreeLayersImageSegmenter.WhiteLayerIndex

Index of the white layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
virtual uint WhiteLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the white layer.

4.245. ETwoLayersImageSegmenter Class

The base class from which all the segmenters that produce two layers derive.

Remarks

The Layer Encoding can be enabled/disabled for each layer individually. The index of the layers in the coded image can also be assigned individually.

Base Class:EImageSegmenter

Derived Class (es):
EBinaryImageSegmenter
EColorRangeThresholdSegmenter
EColorSingleThresholdSegmenter
EGrayscaleSingleThresholdSegmenterEImageRangeSegmenterEReferenceImageSegmenter

Namespace: Euresys.Open_eVision.Segmenters

Properties

BlackLayerEncoded	Black layer encoding status.
BlackLayerIndex	Index of the black layer in the destination coded image.
WhiteLayerEncoded	White layer encoding status.
WhiteLayerIndex	Index of the white layer in the destination coded image.

Methods

Load	Load the ETwoLayersImageSegmenter configuration. The given ESerializer must have been created for reading.
operator==	Comparison operator.
Save	Save the ETwoLayersImageSegmenter configuration. The given ESerializer must have been created for writing.

ETwoLayersImageSegmenter.BlackLayerEncoded

Black layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

```
[C#]
virtual bool BlackLayerEncoded
  { get; set; }
```

ETwoLayersImageSegmenter.BlackLayerIndex

Index of the black layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
virtual uint BlackLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the black layer.

ETwoLayersImageSegmenter.Load

Load the ETwoLayersImageSegmenter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ETwoLayersImageSegmenter.operator==

Comparison operator.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
bool operator==(
 Euresys.Open_eVision.Segmenters.ETwoLayersImageSegmenter other
 )
```

Parameters

other

-

ETwoLayersImageSegmenter.Save

Save the ETwoLayersImageSegmenter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

ETwoLayersImageSegmenter.WhiteLayerEncoded

White layer encoding status.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
virtual bool WhiteLayerEncoded
  { get; set; }
```

ETwoLayersImageSegmenter.WhiteLayerIndex

Index of the white layer in the destination coded image.

Namespace: Euresys.Open_eVision.Segmenters

[C#]

```
virtual uint WhiteLayerIndex
  { get; set; }
```

Remarks

Setting this property automatically switches on the encoding of the white layer.

4.246. EUnsupervisedSegmenter Class

Unsupervised segmentation tool.

The unsupervised segmentation tool learns a model of what is a good product and it can be used for classiyfing whether an image is from a good or defective product and for segmenting the defects within the image.
To learn a model of what is a good product, the tool is trained by considering only the images from the good label (EUnsupervisedSegmenter::GoodLabel). The tool labels (EDeepLearningTool::GetLabel) will always be empty.
The tool can work with images of any resolution higher than EUnsupervisedSegmenter::PatchSize by merging the results obtained by applying the deep neural network using a sliding window algorithm. The overlapping between the sliding windows is controled by EUnsupervisedSegmenter::SamplingDensity.
The unsupervised segmenter offers a tradeoff between a high good detection rate and a high bad detection rate through a classification threshold that can be configured after training (EUnsupervisedSegmenter::ClassificationThreshold).

Base Class:EDeepLearningTool

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

Capacity	Capacity of the EUnsupervisedSegmenter. A higher capacity makes the unsupervised segmenter capable of learning more information at the cost of a slower processing speed.
ClassificationThreshold	Classification threshold for the score of an image (See EUnsupervisedSegmenterResult::ClassificationScore). A image with a score smaller or equal to the classification threshold will be classified as good.
ForceGrayscale	Forces the EUnsupervisedSegmenter to convert all images to grayscale (default: true). Setting this property to false will make the underlying neural network operates with the same number of channels as the images in the dataset used for training. Otherwise, color images will be converted to grayscale before using them.
GoodLabel	Name of the good label in the dataset that is used for training (default value: empty).
InferenceScale	The effective scale applied when performing inference. If EUnsupervisedSegmenter::ScaleDisabledAtInference is true, it is equal to 1.0. Otherwise, it is equal to EUnsupervisedSegmenter::Scale.
PatchSize	Patch size (width and height of the patches processed by the neural network).

SamplingDensity	Sampling density (default value: 2.0, its value must be equal or greater than 1). The sampling density is the parameter of the sliding window algorithm used for processing a whole image using subwindows of size EUnsupervisedSegmenter::PatchSize. It indicates how much overlap there will be between the image patches: the stride between two consecutive patches is EUnsupervisedSegmenter::PatchSize / EUnsupervisedSegmenter::SamplingDensity.
Scale	Down-scaling applied to images before processing them. Its value is between 0 and 1 (default value: 1).
ScaleDisabledAtInference	Whether to apply the scale parameter at inference or not. If you disable the scale at inference, make sure your images are already scaled. For example, if you trained with images of 1024x1024 and a scale of 0.5, the inference images should be 512 x 512 images with the same field of view as the training images.
ToolType	Type of the deep learning tool.

Methods

Apply	Applies the unsupervised segmenter on the given image and its mask region. We recommend to use pointer-based versions of this method to avoid unnecessary image and result copies.
EUnsupervisedSegmenter	Constructs a EUnsupervisedSegmenter object.
GetNumPatchesForImage	Number of patches that will be extracted from an input image to perform inference. For EasyClassify and EasyLocate, this will always be equal to 1. For EasySegment, the number of patches will depend on the scale, patch size and sampling density parameters.
GetTrainingMetrics	Training metrics at the given iteration
GetValidationMetrics	Validation metrics at the given iteration
operator=	Assignment operator
SerializeSettings	Serializes the settings of the unsupervised segmenter.

EUnsupervisedSegmenter.Apply

Applies the unsupervised segmenter on the given image and its mask region. We recommend to use pointer-based versions of this method to avoid unnecessary image and result copies.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult Apply(
 Euresys.Open_eVision.EBaseROI img
 )
```

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult Apply(
 Euresys.Open_eVision.EBaseROI img,
 Euresys.Open_eVision.ERegion mask
 )

Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW8[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW8[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW16[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageBW16[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageC24[] imgs
 )

Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] Apply(
 Euresys.Open_eVision.EImageC24[] imgs,
 Euresys.Open_eVision.ERegion[] masks
 )

void Apply(
 Euresys.Open_eVision.EBaseROI[] imgs,
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] results
 )

void Apply(
 Euresys.Open_eVision.EBaseROI[] imgs,
 Euresys.Open_eVision.ERegion[] masks,
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult[] results
 )
```

Parameters

img
: Image to classify and segment defects in.

mask
: Mask region of the image.

imgs
: Vector of image to classify and segment defects in.

masks
: Vector of mask regions for the images.

results
: -

EUnsupervisedSegmenter.Capacity

Capacity of the EUnsupervisedSegmenter.
A higher capacity makes the unsupervised segmenter capable of learning more information at the cost of a slower processing speed.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterCapacity Capacity
  { get; set; }
```

EUnsupervisedSegmenter.ClassificationThreshold

Classification threshold for the score of an image (See EUnsupervisedSegmenterResult::ClassificationScore).
A image with a score smaller or equal to the classification threshold will be classified as good.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float ClassificationThreshold
  { get; set; }
```

Remarks

The classification threshold is optmized during training to maximize the balanced accuracy of the unsupervised segmenter.
The classification threshold can be changed after training.

EUnsupervisedSegmenter.EUnsupervisedSegmenter

Constructs a EUnsupervisedSegmenter object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EUnsupervisedSegmenter(
 )

void EUnsupervisedSegmenter(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenter other
 )
```

Parameters

other

Reference to the EUnsupervisedSegmenter object that should be copied

EUnsupervisedSegmenter.ForceGrayscale

Forces the EUnsupervisedSegmenter to convert all images to grayscale (default: true).
Setting this property to false will make the underlying neural network operates with the same number of channels as the images in the dataset used for training. Otherwise, color images will be converted to grayscale before using them.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool ForceGrayscale
  { get; set; }
```

EUnsupervisedSegmenter.GetNumPatchesForImage

Number of patches that will be extracted from an input image to perform inference.
For EasyClassify and EasyLocate, this will always be equal to 1.
For EasySegment, the number of patches will depend on the scale, patch size and sampling density parameters.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int GetNumPatchesForImage(
 int imageWidth,
 int imageHeight
 )
```

Parameters

imageWidth

Width of the image for which to get the number of patch

imageHeight

Height of the image for which to get the number of patch

EUnsupervisedSegmenter.GetTrainingMetrics

Training metrics at the given iteration

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterMetrics GetTrainingMetrics(
 int iteration
 )
```

Parameters

iteration

Iteration at which to get the metrics

Remarks

At a given iteration, the metrics will always contain the error (see EUnsupervisedSegmenterMetrics::Error). Other metrics (scores, accuracy, etc.) will be available only at iterations where the validation error is a new minimum.

EUnsupervisedSegmenter.GetValidationMetrics

Validation metrics at the given iteration

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterMetrics
GetValidationMetrics(
 int iteration
 )
```

Parameters

iteration

Iteration at which to get the metrics

Remarks

At a given iteration, the metrics will always contain the error (see EUnsupervisedSegmenterMetrics::Error). Other metrics (scores, accuracy, etc.) will be available only at iterations where the validation error is a new minimum.

EUnsupervisedSegmenter.GoodLabel

Name of the good label in the dataset that is used for training (default value: empty).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
string GoodLabel
  { get; set; }
```

EUnsupervisedSegmenter.InferenceScale

The effective scale applied when performing inference.
If EUnsupervisedSegmenter::ScaleDisabledAtInference is true, it is equal to 1.0. Otherwise, it is equal to EUnsupervisedSegmenter::Scale.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float InferenceScale
  { get; }
```

EUnsupervisedSegmenter.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenter operator=(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenter other
 )
```

Parameters

other

Reference to the EUnsupervisedSegmenter object that should be copied

EUnsupervisedSegmenter.PatchSize

Patch size (width and height of the patches processed by the neural network).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int PatchSize
  { get; set; }
```

Remarks

There are three supported patch size: 64x64, 128x128, and 256x256. By default, the patch size is 0 and it means that the patch size will be 128x128 if all images in the training and validation dataset have a higher resolution or the patch size will be 64x64.

EUnsupervisedSegmenter.SamplingDensity

Sampling density (default value: 2.0, its value must be equal or greater than 1).
The sampling density is the parameter of the sliding window algorithm used for processing a whole image using subwindows of size EUnsupervisedSegmenter::PatchSize. It indicates how much overlap there will be between the image patches: the stride between two consecutive patches is EUnsupervisedSegmenter::PatchSize / EUnsupervisedSegmenter::SamplingDensity.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float SamplingDensity
  { get; set; }
```

EUnsupervisedSegmenter.Scale

Down-scaling applied to images before processing them. Its value is between 0 and 1 (default value: 1).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Scale
  { get; set; }
```

EUnsupervisedSegmenter.ScaleDisabledAtInference

Whether to apply the scale parameter at inference or not.
If you disable the scale at inference, make sure your images are already scaled. For example, if you trained with images of 1024x1024 and a scale of 0.5, the inference images should be 512 x 512 images with the same field of view as the training images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool ScaleDisabledAtInference
  { get; set; }
```

EUnsupervisedSegmenter.SerializeSettings

Serializes the settings of the unsupervised segmenter.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void SerializeSettings(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Pointer to ESerializer

EUnsupervisedSegmenter.ToolType

Type of the deep learning tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
override Euresys.Open_eVision.EasyDeepLearning.EDeepLearningToolType ToolType
  { get; }
```

4.247. EUnsupervisedSegmenterMetrics Class

Collection of metrics used to evaluate the state of an EUnsupervisedSegmenter.
A metric is a value summarizing the quality of a collection of unsupervised segmentation results (see EUnsupervisedSegmenterResult) with respect to their ground truth.
New results can be added to the object individually with EUnsupervisedSegmenterMetrics::AddResult or collectively with EUnsupervisedSegmenterMetrics::AddMetrics.

EUnsupervisedSegmenterMetrics contains two types of metrics: unsupervised metrics that are computed only on good images and supervised/defect detection metrics that are computed on both good and bad images. The defect detection metrics are accessible only when results for bad images were added to the object. When supervised metrics are accessible, EUnsupervisedSegmenterMetrics::IsTotallyUnsupervised is false.
There is only one unsupervised metric: the error (see EUnsupervisedSegmenterMetrics::Error).
See EDeepLearningDefectDetectionMetrics for a description of the defect detection metrics.

Base Class:EDeepLearningDefectDetectionMetrics

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

AverageScoreOnDefectiveImages	Gets the average score of defective images.
AverageScoreOnGoodImages	Gets the average score of good images.
Error	The error of the segmenter. This metric is only available in the metrics computed during a training which are accessible through EUnsupervisedSegmenter::GetValidationMetrics. The error, which is also called the loss, is the quantity that is minimized during the training of the deep neural network.

Methods

AddErrorResult	Adds the given result to the metric for error computation. The result must be computed from a good image that was corrupted during training.
AddMetrics	Adds the other metrics to the current metrics of this object.
AddResult	Adds the given result with the corresponding ground truth label to the metrics.
EUnsupervisedSegmenterMetrics	Constructs an EUnsupervisedSegmenterMetrics object.
GetBestWeightedAccuracy	Best achievable weighted accuracy. The weighted accuracy is the weighted average of the true positive rate and the true negative rate (which is equal to 1 minus the false positive rate). See EROCPoint. The classification threshold corresponding to this accuracy is given by EUnsupervisedSegmenterMetrics::GetBestWeightedAccuracyClassificationThreshold.
GetBestWeightedAccuracyClassificationThreshold	Classification threshold giving the best achievable weighted accuracy (see EUnsupervisedSegmenterMetrics::GetBestWeightedAccuracy).
IsTotallyUnsupervised	Whether this metrics has results from only good images (true) or from both good and defective images (false). Some metrics are accessible only if EUnsupervisedSegmenterMetrics::IsTotallyUnsupervised is false.
IsValid	Indicates whether the object contains at least one result.
Load	Loads an unsupervised segmentation metric. The given ESerializer must have been created for reading.
operator=	Assignment operator.
RemoveErrorResult	Removes the given result from the metric for error computation. The result must be computed from a good image that was corrupted during training.
RemoveResult	Removes the given result with the corresponding ground truth label to the metrics.
Save	Saves an unsupervised segmentation metric. The given ESerializer must have been created for writing.

EUnsupervisedSegmenterMetrics.AddErrorResult

Adds the given result to the metric for error computation. The result must be computed from a good image that was corrupted during training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void AddErrorResult(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult result
 )
```

Parameters

result

A reference to an EUnsupervisedSegmenterResult object.

EUnsupervisedSegmenterMetrics.AddMetrics

Adds the other metrics to the current metrics of this object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void AddMetrics(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterMetrics other
 )
```

Parameters

other

Unsupervised segmenter metrics

EUnsupervisedSegmenterMetrics.AddResult

Adds the given result with the corresponding ground truth label to the metrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void AddResult(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult result,
 bool isGoodImage
 )
```

Parameters

result

A reference to an EUnsupervisedSegmenterResult object.

isGoodImage

True if the ground truth of this result is good, else false.

EUnsupervisedSegmenterMetrics.AverageScoreOnDefectiveImages

Gets the average score of defective images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AverageScoreOnDefectiveImages
  { get; }
```

EUnsupervisedSegmenterMetrics.AverageScoreOnGoodImages

Gets the average score of good images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float AverageScoreOnGoodImages
  { get; }
```

EUnsupervisedSegmenterMetrics.Error

The error of the segmenter.
This metric is only available in the metrics computed during a training which are accessible through EUnsupervisedSegmenter::GetValidationMetrics.
The error, which is also called the loss, is the quantity that is minimized during the training of the deep neural network.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Error
  { get; }
```

EUnsupervisedSegmenterMetrics.EUnsupervisedSegmenterMetrics

Constructs an EUnsupervisedSegmenterMetrics object.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void EUnsupervisedSegmenterMetrics(
 )
void EUnsupervisedSegmenterMetrics(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterMetrics other
 )
```

Parameters

other

Reference to the EUnsupervisedSegmenterMetrics object that should be copied

EUnsupervisedSegmenterMetrics.GetBestWeightedAccuracy

Best achievable weighted accuracy.
The weighted accuracy is the weighted average of the true positive rate and the true negative rate (which is equal to 1 minus the false positive rate). See EROCPoint.
The classification threshold corresponding to this accuracy is given by EUnsupervisedSegmenterMetrics::GetBestWeightedAccuracyClassificationThreshold.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetBestWeightedAccuracy(
 float goodWeight,
 float badWeight
 )

float GetBestWeightedAccuracy(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

goodWeight

-

badWeight

-

dataset

Dataset to get the label weight from.

Remarks

When using a dataset as the source for the label weights, the good weight is the weight of the "good" label and the bad weight is the sum of the weights of all the other labels.

EUnsupervisedSegmenterMetrics.GetBestWeightedAccuracyClassificationThreshold

Classification threshold giving the best achievable weighted accuracy (see EUnsupervisedSegmenterMetrics::GetBestWeightedAccuracy).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float GetBestWeightedAccuracyClassificationThreshold(
 float goodWeight,
 float badWeight
 )

float GetBestWeightedAccuracyClassificationThreshold(
 Euresys.Open_eVision.EasyDeepLearning.EClassificationDataset dataset
 )
```

Parameters

goodWeight

Weight for the good label

badWeight

Weight for the bad label

dataset

Dataset to get the label weight from.

EUnsupervisedSegmenterMetrics.IsTotallyUnsupervised

Whether this metrics has results from only good images (true) or from both good and defective images (false).
Some metrics are accessible only if EUnsupervisedSegmenterMetrics::IsTotallyUnsupervised is false.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsTotallyUnsupervised(
 )
```

EUnsupervisedSegmenterMetrics.IsValid

Indicates whether the object contains at least one result.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

EUnsupervisedSegmenterMetrics.Load

Loads an unsupervised segmentation metric. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EUnsupervisedSegmenterMetrics.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterMetrics operator=(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterMetrics other
 )
```

Parameters

other

Reference to the EUnsupervisedSegmenterMetrics object used for the assignment

EUnsupervisedSegmenterMetrics.RemoveErrorResult

Removes the given result from the metric for error computation. The result must be computed from a good image that was corrupted during training.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveErrorResult(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult result
 )
```

Parameters

result

A reference to an EUnsupervisedSegmenterResult object.

EUnsupervisedSegmenterMetrics.RemoveResult

Removes the given result with the corresponding ground truth label to the metrics.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void RemoveResult(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult result,
 bool isGoodImage
 )
```

Parameters

result

A reference to an EUnsupervisedSegmenterResult object.

isGoodImage

True if the ground truth of this result is good, else false.

EUnsupervisedSegmenterMetrics.Save

Saves an unsupervised segmentation metric. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

4.248. EUnsupervisedSegmenterResult Class

An EUnsupervisedSegmenterResult object represents the result of a EUnsupervisedSegmenter tool.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

ClassificationScore	Score that is used for classification of the image.
Error	Error of the image.
Region	Returns the segmented region. The segmented region corresponds to the pixels that have a value strictly higher than 0 in the segmentation map (see EUnsupervisedSegmenterResult::SegmentationMap).
SegmentationMap	Returns the segmentation map. The segmentation map is a grayscale image where all defective pixels have a value strictly higher than 0. The value of a pixel is proportional to the importance of the defect at that position.

Methods

Draw	Draws the segmentation (with transparency). To indicate the importance of the defect at a given pixel, the segmentation is drawn using a gradient going from yellow (least important) to red (maximum importance) (See EUnsupervisedSegmenterResult::SegmentationMap).
EUnsupervisedSegmenterResult	Constructs a non-valid EUnsupervisedSegmenterResult.
IsComplete	Indicates whether the result is complete and ready to be used.
IsDefective	Indicates whether the result is defective/not good based on the threshold of the unsupervised segmentation tool that produced the result (see EUnsupervisedSegmenter::ClassificationThreshold).
IsGood	Indicates whether the result is good based on the threshold of the unsupervised segmentation tool that produced the result (see EUnsupervisedSegmenter::ClassificationThreshold).
IsValid	Indicates whether the result was produced by a EUnsupervisedSegmenter object. A default contructed EUnsupervisedSegmenterResult is not valid.
operator=	Assignment operator

EUnsupervisedSegmenterResult.ClassificationScore

Score that is used for classification of the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float ClassificationScore
  { get; }
```

Remarks

The classification score is the value which is compared to the classification threshold of the EUnsupervisedSegmenter to decide whether the corresponding image is good or defective.

EUnsupervisedSegmenterResult.Draw

Draws the segmentation (with transparency).
To indicate the importance of the defect at a given pixel, the segmentation is drawn using a gradient going from yellow (least important) to red (maximum importance) (See EUnsupervisedSegmenterResult::SegmentationMap).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
void Draw(
 IntPtr graphicsContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

Parameters

graphicsContext

-

zoomX

Horizontal zooming factor. A value greater than 1 means zoom in. By default, true scale is used.

zoomY

Vertical zooming factor. A value greater than 1 means zoom in. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EUnsupervisedSegmenterResult.Error

Error of the image.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
float Error
  { get; }
```

Remarks

The error is the quantity that is minimized on good images during training.

EUnsupervisedSegmenterResult.EUnsupervisedSegmenterResult

Constructs a non-valid EUnsupervisedSegmenterResult.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void EUnsupervisedSegmenterResult(
 )
void EUnsupervisedSegmenterResult(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult other
 )
```

Parameters

other

Reference to the EUnsupervisedSegmenterResult object that should be copied

EUnsupervisedSegmenterResult.IsComplete

Indicates whether the result is complete and ready to be used.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsComplete(
 )
```

EUnsupervisedSegmenterResult.IsDefective

Indicates whether the result is defective/not good based on the threshold of the unsupervised segmentation tool that produced the result (see EUnsupervisedSegmenter::ClassificationThreshold).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsDefective(
 )
```

EUnsupervisedSegmenterResult.IsGood

Indicates whether the result is good based on the threshold of the unsupervised segmentation tool that produced the result (see EUnsupervisedSegmenter::ClassificationThreshold).

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
bool IsGood(
 )
```

EUnsupervisedSegmenterResult.IsValid

Indicates whether the result was produced by a EUnsupervisedSegmenter object.
A default contructed EUnsupervisedSegmenterResult is not valid.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
bool IsValid(
 )
```

EUnsupervisedSegmenterResult.operator=

Assignment operator

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult operator=(
 Euresys.Open_eVision.EasyDeepLearning.EUnsupervisedSegmenterResult other
 )
```

Parameters

other

Reference to the EUnsupervisedSegmenterResult object used for the assignment

EUnsupervisedSegmenterResult.Region

Returns the segmented region. The segmented region corresponds to the pixels that have a value strictly higher than 0 in the segmentation map (see EUnsupervisedSegmenterResult::SegmentationMap).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.ERegion Region
  { get; }
```

EUnsupervisedSegmenterResult.SegmentationMap

Returns the segmentation map. The segmentation map is a grayscale image where all defective pixels have a value strictly higher than 0. The value of a pixel is proportional to the importance of the defect at that position.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
Euresys.Open_eVision.EImageBW8 SegmentationMap
  { get; }
```

4.249. EUnwarpingLut Class

This class is used only as a lookup table in the EWorldShape::Unwarp and EWorldShape::SetupUnwarp methods. It has no other use of its own.

Namespace: Euresys.Open_eVision

Methods

EUnwarpingLut	Constructs a EUnwarpingLut object that is used to speed-up the unwarping process.

EUnwarpingLut.EUnwarpingLut

Constructs a EUnwarpingLut object that is used to speed-up the unwarping process.

Namespace: Euresys.Open_eVision

[C#]

```
void EUnwarpingLut(
 )
```

4.250. EUtils Class

3D Utilitarian Functions.

Namespace: Euresys.Open_eVision.Easy3D

Methods

Copy	Copies a source map or a constant in a destination map.

EUtils.Copy

Copies a source map or a constant in a destination map.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Copy(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceImage,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationImage
 )
```

```
void Copy(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceImage,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceImage,
 Euresys.Open_eVision.Easy3D.EZMap32f destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceImage,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceImage,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceImage,
 Euresys.Open_eVision.Easy3D.EDepthMap32f destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EZMap8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EZMap16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EZMap32f sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap32f destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EDepthMap8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.Easy3D.EDepthMap16 sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationImage
 )
```

```
void Copy(
 Euresys.Open_eVision.Easy3D.EDepthMap32f sourceImage,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap32f destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth8 constant,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth16 constant,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth32f constant,
 Euresys.Open_eVision.Easy3D.EZMap32f destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth8 constant,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth16 constant,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth32f constant,
 Euresys.Open_eVision.Easy3D.EDepthMap32f destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth8 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap8 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth16 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap16 destinationImage
 )

void Copy(
 Euresys.Open_eVision.EDepth32f constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EZMap32f destinationImage
 )
```

```
void Copy(
 Euresys.Open_eVision.EDepth8 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap8 destinationImage
 )
void Copy(
 Euresys.Open_eVision.EDepth16 constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap16 destinationImage
 )
void Copy(
 Euresys.Open_eVision.EDepth32f constant,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EDepthMap32f destinationImage
 )
```

Parameters

sourceImage
Source map.

destinationImage
Destination map.

region
Region on which to copy.

constant
Depth constant.

4.251. EVector Class

Base class for all typed vectors.

Remarks

This class contains all methods that are not type specific. Mainly methods to handle elements count and serialization

Derived Class (es):
EBW16PathVector
EBW16Vector
EBW32Vector
EBW8PathVector
EBW8Vector
EBWHistogramVectorEC24PathVectorEC24VectorEColorVectorEPathVectorEPeakVector

Namespace: Euresys.Open_eVision

Properties

NumElements	Number of elements in the vector.

Methods

Empty	Resets the number of elements to 0.
Load	Loads the EVector object with all its attributes.
RemoveElement	Removes the element at the specified position
Save	Saves the EVector object with all its attributes.

EVector.Empty

Resets the number of elements to 0.

Namespace: Euresys.Open_eVision

[C#]

```
void Empty(
 )
```

EVector.Load

Loads the EVector object with all its attributes.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string file,
 uint un32Version
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer,
 uint un32Version
 )
```

Parameters

file
File path.

un32Version
The file version number.

serializer
Serializer. Must be in read mode.

EVector.NumElements

Number of elements in the vector.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumElements
  { get; set; }
```

EVector.RemoveElement

Removes the element at the specified position

Namespace: Euresys.Open_eVision

```
[C#]
void RemoveElement(
 uint index
 )
```

Parameters

index

Index, between 0 and EVector::NumElements (excluded) of the element to be accessed.

EVector.Save

Saves the EVector object with all its attributes.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string file,
 uint un32Version
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer,
 uint un32Version
 )
```

Parameters

file

File path.

un32Version

The file version number.

serializer

Serializer. Must be in write mode.

4.252. EVectorModel Class

Represents a EShape hierarchy with a single root. This hierarchy can be retrieved from files in different file formats.

Namespace: Euresys.Open_eVision

Properties

Center	Gets the center of the model.
Root	Gets the root of the hierarchy.
Scale	Gets the scale of the model.

Methods

DisableDrawArea	Disables the custom drawing of the EVectorModel with a specific zoom and pan.
Draw	Draws a graphical representation of the hierarchy.
DrawWithCurrentPen	-
EnableDrawArea	Enables the drawing of the EVectorModel with a specific zoom and pan. Default: false
EVectorModel	Constructs an EVectorModel context.
GetVectorModelExtremas	Retrieves the coordinate extremas of the vector model
Load	Loads a Shape.The given ESerializer must have been created for reading.
LoadDXF	Loads an EVectorModel from an ascii DXF file. We do not support the whole possibilities offered by the dxf format. We are currently limited to straight polylines, lines, arcs and points. Blocks are ignored at the moment. Angles are assumed to be given in degrees.
operator=	Assignment operator, copies another EVectorModel instance to this one.
Save	Loads a Shape.The given ESerializer must have been created for writing.

EVectorModel.Center

Gets the center of the model.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
```

```
{ get; set; }
```

EVectorModel.DisableDrawArea

Disables the custom drawing of the EVectorModel with a specific zoom and pan.

Namespace: Euresys.Open_eVision

```
[C#]
void DisableDrawArea(
 )
```

EVectorModel.Draw

Draws a graphical representation of the hierarchy.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext
 )
void Draw(
 IntPtr graphicContext
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EVectorModel.DrawWithCurrentPen

This method is deprecated.

-

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext
 )
```

Parameters

graphicContext

-

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EVectorModel.EnableDrawArea

Enables the drawing of the EVectorModel with a specific zoom and pan. Default: false

Namespace: Euresys.Open_eVision

```
[C#]
void EnableDrawArea(
 int drawWindowWidth,
 int drawWindowHeight
 )
```

Parameters

drawWindowWidth

The width of the window that the EVectorModel is drawn into

drawWindowHeight

The height of the window that the EVectorModel is drawn into

EVectorModel.EVectorModel

Constructs an EVectorModel context.

Namespace: Euresys.Open_eVision

```
[C#]
void EVectorModel(
 )

void EVectorModel(
 Euresys.Open_eVision.EVectorModel frameShape
 )
```

Parameters

frameShape

-

EVectorModel.GetVectorModelExtremas

Retrieves the coordinate extremas of the vector model

Namespace: Euresys.Open_eVision

```
[C#]
void GetVectorModelExtremas(
 ref float xmin,
 ref float ymin,
 ref float xmax,
 ref float ymax,
 bool inSensorCoordinates
 )
```

Parameters

xmin

The X minimum of EVectorModel

ymin

The Y minimum of EVectorModel

xmax

The X maximum of EVectorModel

ymax

The Y maximum of EVectorModel

inSensorCoordinates

Specifies wheather the extremas are retrieved in sensor coordinates. Default: false

EVectorModel.Load

Loads a Shape.The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

```
[C#]
void Load(
 string filePath
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

filePath

The file path.

serializer

Pointer to the ESerializer created for reading.

EVectorModel.LoadDXF

Loads an EVectorModel from an ascii DXF file. We do not support the whole possibilities offered by the dxf format. We are currently limited to straight polylines, lines, arcs and points. Blocks are ignored at the moment. Angles are assumed to be given in degrees.

Namespace: Euresys.Open_eVision

[C#]

```
void LoadDXF(
 string fileName,
 float scale
 )

void LoadDXF(
 string fileName,
 float scale,
 Euresys.Open_eVision.EPoint origin
 )
```

Parameters

fileName

The name of the dxf file.

scale

The scale of the vector model, defaults to 1.

origin

The origin of the EVectorModel in the dxf's coordinates. If not specified, we try to parse the origin from the UCSORG field in the dxf headers. Otherwise, origin is (0, 0).

EVectorModel.operator=

Assignment operator, copies another EVectorModel instance to this one.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EVectorModel operator=(
 Euresys.Open_eVision.EVectorModel other
 )
```

Parameters

other

The EVectorModel instance to copy from.

EVectorModel.Root

Gets the root of the hierarchy.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EFrameShape Root
  { get; }
```

EVectorModel.Save

Loads a Shape.The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

[C#]

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
void Save(
 string filePath
 )
```

Parameters

serializer

Pointer to the ESerializer created for writing.

filePath

The file path.

EVectorModel.Scale

Gets the scale of the model.

Namespace: Euresys.Open_eVision

[C#]

```
float Scale
  { get; set; }
```

4.253. EWedge Class

Represents a model of a wedge (disk, ring, sector or curvilinear quadrilateral).

Base Class:EFrame

Namespace: Euresys.Open_eVision

Properties

Amplitude	Angular amplitude of the EWedge.
ApexAngle	Angular position at the apex of the EWedge.
Breadth	Breadth of the EWedge.
Direct	Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.
EndAngle	Ending angular position of the EWedge.
FullBreadth	Flag indicating if the EWedge has a full breadth (breadth = radius).
FullCircle	Flag indicating if the EWedge is a full circle (amplitude = 2 PI).
InnerApex	Inner apex point coordinates of the EWedge.
InnerArcLength	Inner circle arc length of the EWedge.
InnerDiameter	Inner diameter of the EWedge.
InnerEnd	Inner end point coordinates of the EWedge.
InnerOrg	Inner origin point coordinates of the EWedge.
InnerRadius	Inner radius of the EWedge
OrgAngle	Angular position from where the EWedge extents.
OuterApex	Outer apex point coordinates of the EWedge.
OuterArcLength	Outer circle arc length of the EWedge.
OuterDiameter	Outer diameter of the EWedge.
OuterEnd	Outer end point coordinates of the EWedge.
OuterOrg	Outer origin point coordinates of the EWedge.
OuterRadius	Outer radius of the EWedge.

Methods

CopyTo	Copies all the data of the current EWedge object into another EWedge object and returns it.
EWedge	Constructs a EWedge object.
GetCorners	Retrieves the coordinates of each corner of the EWedge.
GetEdges	Retrieves each edge of the EWedge.

GetInnerPoint	Returns the coordinates of a particular point specified by its location along the inner circle arc.
GetMidEdges	Retrieves the center coordinates of each edge of the wedge fitting gauge.
GetOuterPoint	Returns the coordinates of a particular point specified by its location along the outter circle arc.
GetPoint	Returns the coordinates of a particular point specified by its location along the wedge perimeter.
operator=	Copies all the data from another EWedge object into the current EWedge object
SetDiameters	Sets the nominal inner/outer diameter and breadth of the EWedge.
SetFromCenterAndOrigin	Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedge object.
SetFromOriginMiddleEnd	Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedge object.
SetFromTwoPoints	DEPRECATED (you should use EWedge::SetFromCenterAndOrigin): Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedge object.
SetRadii	Sets the nominal radius and breadth of the EWedge.

EWedge.Amplitude

Angular amplitude of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
float Amplitude
  { get; set; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedge.ApexAngle

Angular position at the apex of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
float ApexAngle
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedge.Breadth

Breadth of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
float Breadth
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.CopyTo

Copies all the data of the current EWedge object into another EWedge object and returns it.

Namespace: Euresys.Open_eVision

```
[C#]
void CopyTo(
 Euresys.Open_eVision.EWedge other
 )

Euresys.Open_eVision.EWedge CopyTo(
 Euresys.Open_eVision.EWedge destinationImage
 )
```

Parameters

other

-

destinationImage

Pointer to the EWedge object in which the current EWedge object data have to be copied.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EWedge object will be created and returned.

EWedge.Direct

Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.

Namespace: Euresys.Open_eVision

[C#]

```
bool Direct
  { get; set; }
```

Remarks

true (default) means that angles increase anticlockwisely in a direct coordinate system, and clockwisely in an inverse coordinate system.
 * When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards.
 * When the field of view is not calibrated, the coordinate system is said to be inverse the abscissa extends rightwards and the ordinate extends downwards.

EWedge.EndAngle

Ending angular position of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
float EndAngle
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedge.EWedge

Constructs a EWedge object.

Namespace: Euresys.Open_eVision

[C#]

```
void EWedge(
 )

void EWedge(
 Euresys.Open_eVision.EPoint center,
 float diameter,
 float breadth,
 float originAngle,
 bool direct
 )

void EWedge(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 float breadth,
 bool direct
 )

void EWedge(
 Euresys.Open_eVision.EPoint center,
 float diameter,
 float breadth,
 float originAngle,
 float amplitude
 )

void EWedge(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 float breadth,
 bool fullCircle
 )
```

```
void EWedge(
 Euresys.Open_eVision.EWedge other
 )
```

Parameters

center

Center coordinates of the wedge at its nominal position. The default value is (0,0).

diameter

Nominal diameter of the wedge. The default value is 100.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

originAngle

Origin point coordinates of the wedge.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system and clockwise in an inverse coordinate system.

origin

Origin point coordinates of the wedge.

amplitude

Nominal angular amplitude of the wedge. The default value is 360.

middle

Middle point coordinates of the wedge.

end

End point coordinates of the wedge.

fullCircle

true (default) in case of a full turn wedge. If fullCircle is false, origin and end give the wedge's amplitude.

other

Another EWedge object to be copied in the new EWedge object.

EWedge.FullBreadth

Flag indicating if the EWedge has a full breadth (breadth = radius).

Namespace: Euresys.Open_eVision

```
[C#]
bool FullBreadth
  { get; }
```

EWedge.FullCircle

Flag indicating if the EWedge is a full circle (amplitude = 2 PI).

Namespace: Euresys.Open_eVision

[C#]

```
bool FullCircle
  { get; }
```

EWedge.GetCorners

Retrieves the coordinates of each corner of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
void GetCorners(
 Euresys.Open_eVision.EPoint ar,
 Euresys.Open_eVision.EPoint AAr,
 Euresys.Open_eVision.EPoint aRR,
 Euresys.Open_eVision.EPoint AARR
 )
```

Parameters

ar

Coordinates of the inner org corner of the EWedge.

AAr

Coordinates of the inner end corner of the EWedge.

aRR

Coordinates of the outer org corner of the EWedge.

AARR

Coordinates of the outer end corner of the EWedge.

EWedge.GetEdges

Retrieves each edge of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
void GetEdges(
 Euresys.Open_eVision.ELine a,
 Euresys.Open_eVision.ELine AA,
 Euresys.Open_eVision.ECircle r,
 Euresys.Open_eVision.ECircle RR
 )
```

Parameters

a
Org edge of the EWedge.

AA
End edge of the EWedge.

r
Inner edge of the EWedge.

RR
Outer edge of the EWedge.

EWedge.GetInnerPoint

Returns the coordinates of a particular point specified by its location along the inner circle arc.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetInnerPoint(
 float fraction
 )
```

Parameters

fraction
Point location expressed as a fraction of the circle arc (range [-1, +1]).

EWedge.GetMidEdges

Retrieves the center coordinates of each edge of the wedge fitting gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void GetMidEdges(
 Euresys.Open_eVision.EPoint a,
 Euresys.Open_eVision.EPoint AA,
 Euresys.Open_eVision.EPoint r,
 Euresys.Open_eVision.EPoint RR
 )
```

Parameters

a
Center coordinates of the org edge of the EWedge.

AA
Center coordinates of the end edge of the EWedge.

r
Center coordinates of the inner edge of the EWedge.

RR
Center coordinates of the outer edge of the EWedge.

EWedge.GetOuterPoint

Returns the coordinates of a particular point specified by its location along the outter circle arc.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetOuterPoint(
 float fraction
 )
```

Parameters

fraction
Point location expressed as a fraction of the circle arc (range [-1, +1]).

EWedge.GetPoint

Returns the coordinates of a particular point specified by its location along the wedge perimeter.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 float breadthFraction,
 float angleFraction
 )
```

Parameters

breadthFraction
Point location expressed as a fraction of the wedge breadth (range -1, +1).

angleFraction
Point location expressed as a fraction of the wedge amplitude (range -1, +1).

EWedge.InnerApex

Inner apex point coordinates of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint InnerApex
  { get; }
```

EWedge.InnerArcLength

Inner circle arc length of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
float InnerArcLength
  { get; }
```

EWedge.InnerDiameter

Inner diameter of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
float InnerDiameter
  { get; }
```

EWedge.InnerEnd

Inner end point coordinates of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint InnerEnd
  { get; }
```

EWedge.InnerOrg

Inner origin point coordinates of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint InnerOrg
  { get; }
```

EWedge.InnerRadius

Inner radius of the EWedge

Namespace: Euresys.Open_eVision

```
[C#]
float InnerRadius
  { get; }
```

EWedge.operator=

Copies all the data from another EWedge object into the current EWedge object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EWedge operator=(
 Euresys.Open_eVision.EWedge other
 )
```

Parameters

other
EWedge object to be copied

EWedge.OrgAngle

Angular position from where the EWedge extents.

Namespace: Euresys.Open_eVision

```
[C#]
float OrgAngle
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedge.OuterApex

Outer apex point coordinates of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint OuterApex
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.OuterArcLength

Outer circle arc length of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
float OuterArcLength
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.OuterDiameter

Outer diameter of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
float OuterDiameter
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.OuterEnd

Outer end point coordinates of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint OuterEnd
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.OuterOrg

Outer origin point coordinates of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint OuterOrg
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal outer radius (diameter), its breadth (must be negative), the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.OuterRadius

Outer radius of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
float OuterRadius
  { get; }
```

Remarks

A EWedge is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedge.SetDiameters

Sets the nominal inner/outer diameter and breadth of the EWedge.

Namespace: Euresys.Open_eVision

[C#]

```
void SetDiameters(
 float diameter,
 float breadth
 )
```

Parameters

diameter

Outer diameter of the EWedge. The default value is 100.

breadth

Breadth of the EWedge. It must be negative or zero. Its default value is -50.

Remarks

A EWedge is fully defined knowing its nominal position (given by the coordinates of its center), its nominal outer radius (diameter), its breadth, the angular position from where it extents, its angular amplitude and its outline tolerance.
By default, the EWedge diameter value is 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

EWedge.SetFromCenterAndOrigin

Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedge object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromCenterAndOrigin(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 float breadth,
 bool direct
 )
```

Parameters

center

Center coordinates of the wedge at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system and clockwise in an inverse coordinate system.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedge.SetFromOriginMiddleEnd

Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedge object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 float breadth,
 bool fullCircle
 )
```

Parameters

origin

Origin point coordinates of the wedge.

middle

Middle point coordinates of the wedge.

end

End point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

fullCircle

true (default) in case of a full turn wedge. If fullCircle is false, origin and end give the wedge's amplitude.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedge.SetFromTwoPoints

This method is deprecated.

DEPRECATED (you should use EWedge::SetFromCenterAndOrigin): Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedge object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 float breadth,
 bool direct
 )
```

Parameters

center

Center coordinates of the wedge at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system and clockwise in an inverse coordinate system.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedge.SetRadii

Sets the nominal radius and breadth of the EWedge.

Namespace: Euresys.Open_eVision

```
[C#]
void SetRadii(
 float radius,
 float breadth
 )
```

Parameters

radius

Outer radius of the EWedge. The default value is 50.

breadth

Breadth of the EWedge, which must be negative or zero. Its default value is -50.

Remarks

A EWedge is fully defined knowing its nominal position (given by the coordinates of its center), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude and its outline tolerance.
By default, the EWedge radius value is 50, which means 50 pixels when the field of view is not calibrated and 50 "units" in case of a calibrated field of view.

4.254. EWedgeGauge Class

Manages a wedge fitting gauge.

Base Class:EWedgeShape

Namespace: Euresys.Open_eVision

Properties

Active	Sets the flag indicating whether the gauge is active or not.
ActiveEdges	Active edges as defined in EDragHandle.
AverageDistance	Average distance between the sampled points and the fitted model.
FilteringThreshold	Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

HVConstraint	Status of the restriction on the orientation of the point location gauge or model fitting sample paths.
MeasuredWedge	Information pertaining to the fitted wedge.
MinAmplitude	Offset added to the Threshold when a peak is to be detected.
MinArea	Minimum area value.
NumFilteringPasses	Number of filtering passes for a model fitting operation.
NumSamples	Number of sampled points during the model fitting operation.
NumSamplesa	Number of sampled points found on edge a during the measure operation.
NumSamplesA	Number of sampled points found on edge A during the measure operation.
NumSamplesInnerEdge	Number of sampled points found on inner edge during the measure operation.
NumSamplesLeftEdge	Number of sampled points found on leftmost edge during the measure operation.
NumSamplesOuterEdge	Number of sampled points found on outer edge during the measure operation.
NumSamplesr	Number of sampled points found on edge r during the measure operation.
NumSamplesR	Number of sampled points found on edge R during the measure operation.
NumSamplesRightEdge	Number of sampled points found on rightmost edge during the measure operation.
NumSkipRanges	Number of skip ranges in the gauge after a call to EWedgeGauge::AddSkipRange.
NumValidSamples	Number of valid sample points remaining after a model fitting operation.
RectangularSamplingArea	Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.
SamplingStep	Approximate distance between sampled points during a model fitting operation.
Smoothing	Number of pixels used for the low-pass filtering operation.
Thickness	Number of parallel segments used to extract the data profile.
Threshold	Threshold level used to delimit significant peaks in the data profile.
Tolerance	Searching area half thickness of the wedge fitting gauge.
TransitionChoice	Transition choice.
TransitionIndex	Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.
TransitionType	Transition type.
Type	Shape type.

Valid	Flag indicating if at least one valid transition has been found.
Wedge	Sets the nominal position (center coordinates), diameter, breadth, angular origin and amplitude of the wedge fitting gauge according to a known wedge.

Methods

AddSkipRange	Adds an item to the set of skip ranges and returns the index of the newly added range.
CopyTo	Copies all the data of the current EWedgeGauge object into another EWedgeGauge object, and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the gauge.
Draw	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
DrawWithCurrentPen	Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.
EWedgeGauge	Constructs a wedge measurement context.
GetMeasuredPoint	Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.
GetMinNumFitSamples	Returns the minimum number of samples required for fitting on each side of the shape.
GetSamplea	Allows to retrieve information on the samples found along the a edge.
GetSampleA	Allows to retrieve information on the samples found along the A edge.
GetSampleInnerEdge	Allows to retrieve information on the samples found along the inner edge.
GetSampleLeftEdge	Allows to retrieve information on the samples found along the left edge.
GetSampleOuterEdge	Allows to retrieve information on the samples found along the outer edge.
GetSampler	Allows to retrieve information on the samples found along the r edge.
GetSampleR	Allows to retrieve information on the samples found along the R edge.
GetSampleRightEdge	Allows to retrieve information on the samples found along the rightmost edge.
GetSkipRange	Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the EWedgeGauge::AddSkipRange method.
HitTest	Checks whether the cursor is positioned over a handle (true) or not (false).
Measure	Triggers the point location or the model fitting operation.
MeasureSample	Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.

MeasureWithoutFitting	Triggers the point location without wedge fitting operation.
operator=	Copies all the data from another EWedgeGauge object into the current EWedgeGauge object
Plot	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
PlotWithCurrentPen	Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.
Process	Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.
RemoveAllSkipRanges	Removes all the skip ranges previously created by a call to EWedgeGauge::AddSkipRange.
RemoveSkipRange	After a call to EWedgeGauge::AddSkipRange, removes the skip range with the given index.
SetDiameters	Sets the nominal inner/outer diameter and breadth of the EWedgeGauge.
SetFromOriginMiddleEnd	Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeGauge object.
SetFromTwoPoints	DEPRECATED (you should use EWedgeGauge): Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeGauge object.
SetMinNumFitSamples	Sets the minimum number of samples required for fitting on each side of the shape.
SetRadii	Sets the nominal radius and breadth of the EWedgeGauge.

EWedgeGauge.Active

Sets the flag indicating whether the gauge is active or not.

Namespace: Euresys.Open_eVision

[C#]

```
override bool Active
  { get; set; }
```

Remarks

When complex gauging is required, several gauges can be grouped together. Applying EWedgeGauge::Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process. By default, the gauge is active (true).

EWedgeGauge.ActiveEdges

Active edges as defined in EDragHandle.

Namespace: Euresys.Open_eVision

[C#]

```
uint ActiveEdges
  { get; set; }
```

Remarks

In the case of a wedge fitting gauge, each edge can have its own transition detection parameters. Updating the transition parameters only affect the current active edges. By default, all edges are active.

EWedgeGauge.AddSkipRange

Adds an item to the set of skip ranges and returns the index of the newly added range.

Namespace: Euresys.Open_eVision

[C#]

```
uint AddSkipRange(
 uint start,
 uint end
 )
```

Parameters

start

Beginning of the skip range.

end

End of the skip range.

Remarks

The samples indices between start and end (including the boundaries) will be discarded during the measurement process.
The EWedgeGauge::AddSkipRange method allows to define skip ranges in an EWedgeGauge. This means that, at measure time, samples belonging to these ranges will not be taken into account.
A sample may belong to more than one skip range; to be discarded, a sample has to pertain to at least one range. Moreover, the skip ranges are allowed to overlap one another.
The range is allowed to be reversed (i.e. end is not required to be greater than start).
Also, start and end are not required to reference valid indices at the time of the call (i.e. the range may lie outside of the current return value for EWedgeGauge::NumSamples).

EWedgeGauge.AverageDistance

Average distance between the sampled points and the fitted model.

Namespace: Euresys.Open_eVision

[C#]

```
float AverageDistance
```

```
{ get; }
```

Remarks

Irrelevant in case of a point location operation.

EWedgeGauge.CopyTo

Copies all the data of the current EWedgeGauge object into another EWedgeGauge object, and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EWedgeGauge other,
 bool recursive
 )

Euresys.Open_eVision.EWedgeGauge CopyTo(
 Euresys.Open_eVision.EWedgeGauge other,
 bool recursive
 )
```

Parameters

other

Pointer to the EWedgeGauge object in which the current EWedgeGauge object data have to be copied.

recursive

true if the children gauges have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EWedgeGauge object will be created and returned.

EWedgeGauge.Drag

Moves a handle to a new position and updates the position parameters of the gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int x,
 int y
 )
```

Parameters

x

Cursor current X coordinate.

y

Cursor current Y coordinate.

EWedgeGauge.Draw

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWedgeGauge.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a point location or model fitting gauge, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWedgeGauge.EWedgeGauge

Constructs a wedge measurement context.

Namespace: Euresys.Open_eVision

```
[C#]
void EWedgeGauge(
 )

void EWedgeGauge(
 Euresys.Open_eVision.EWedgeGauge other
 )
```

Parameters

other

Another EWedgeGauge object to be copied in the new EWedgeGauge object.

Remarks

With the default constructor, all the parameters are initialized to their respective default values. With the copy constructor, the constructed wedge measurement context is based on a pre-existing EWedgeGauge object. The gauge children are also copied. Hierarchy copying through a copy constructor is always recursive. To disable this recursion, use instead the EWedgeGauge::CopyTo method.

EWedgeGauge.FilteringThreshold

Relative filtering threshold, that is the fraction of the average distance between the sampled points and the fitted model above which a point is filtered out.

Namespace: Euresys.Open_eVision

[C#]

```
float FilteringThreshold
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation. During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious).

EWedgeGauge.GetMeasuredPoint

Returns the coordinates of a sample point, measured along one of the sample paths of the gauge.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetMeasuredPoint(
 uint index
 )
```

Parameters

index

This argument must be left unchanged from its default value, i.e. ~0 (= 0xFFFFFFFF).

Remarks

These coordinates pertain to the world space; they are expressed in the reference frame to which the current EWedgeGauge object belongs. The gauging process uses a list of sample points to find the shape position and size that best fit a given image. These sample points are measured along the sample paths defined by the gauge geometry. EWedgeGauge::GetMeasuredPoint returns the coordinates of the sample point that meets the following two requirements: 1. It lies on the sample path inspected with the last call to EWedgeGauge::MeasureSample, and 1. Among all the sample points along the latter sample path, it is the one selected by the EWedgeGauge::TransitionChoice property.

Note. For this method to succeed, it is necessary to previously call EWedgeGauge::MeasureSample.

EWedgeGauge.GetMinNumFitSamples

Returns the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void GetMinNumFitSamples(
 out int side0,
 out int side1,
 out int side2,
 out int side3
 )
```

Parameters

side0

Minimum number of samples on the top side of the rectangle.

side1

Minimum number of samples on the left side of the rectangle.

side2

Minimum number of samples on the bottom side of the rectangle.

side3

Minimum number of samples on the right side of the rectangle.

Remarks

Irrelevant in case of a point location operation.

EWedgeGauge.GetSampleA

This method is deprecated.

Allows to retrieve information on the samples found along the A edge.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetSampleA(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSampleA(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )
bool GetSampleA(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use EWedgeGauge::GetSampleRightEdge instead.

EWedgeGauge.GetSampleA

This method is deprecated.

Allows to retrieve information on the samples found along the A edge.

Namespace: Euresys.Open_eVision

```
[C#]
bool GetSampleA(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSampleA(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )
```

```
bool GetSampleA(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use EWedgeGauge::GetSampleRightEdge instead.

EWedgeGauge.GetSampleInnerEdge

Allows to retrieve information on the samples found along the inner edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleInnerEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleInnerEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleInnerEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

EWedgeGauge.GetSampleLeftEdge

Allows to retrieve information on the samples found along the left edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleLeftEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleLeftEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleLeftEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

EWedgeGauge.GetSampleOuterEdge

Allows to retrieve information on the samples found along the outer edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleOuterEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleOuterEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleOuterEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

EWedgeGauge.GetSampleR

This method is deprecated.

Allows to retrieve information on the samples found along the R edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleR(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
```

```
void GetSampleR(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleR(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index

The sample index

sp

ESamplePoint structure that will receive the sample position.

pk

EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use EWedgeGauge::GetSampleInnerEdge instead.

EWedgeGauge.GetSampleR

This method is deprecated.

Allows to retrieve information on the samples found along the R edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleR(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )

void GetSampleR(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )

bool GetSampleR(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt

EPoint structure that will receive the sample position.

index
The sample index
sp
ESamplePoint structure that will receive the sample position.
pk
EPeak structure that will contain the sample peak properties.

Remarks

Deprecation notice: Use EWedgeGauge::GetSampleInnerEdge instead.

EWedgeGauge.GetSampleRightEdge

Allows to retrieve information on the samples found along the rightmost edge.

Namespace: Euresys.Open_eVision

[C#]

```
bool GetSampleRightEdge(
 Euresys.Open_eVision.EPoint pt,
 uint index
 )
void GetSampleRightEdge(
 Euresys.Open_eVision.ESamplePoint sp,
 uint index
 )
bool GetSampleRightEdge(
 ref Euresys.Open_eVision.EPeak pk,
 uint index
 )
```

Parameters

pt
EPoint structure that will receive the sample position.
index
The sample index
sp
ESamplePoint structure that will receive the sample position.
pk
EPeak structure that will contain the sample peak properties.

Remarks

The method provides the sample point corresponding to the supplied index.
The returned value is true when the sample is valid, and false otherwise.

EWedgeGauge.GetSkipRange

Allows to retrieve the start and end values of the skip range corresponding to the given index, if it is valid (i.e. if it has previously been created by a call to the EWedgeGauge::AddSkipRange method.

Namespace: Euresys.Open_eVision

```
[C#]
void GetSkipRange(
 uint index,
 out uint start,
 out uint end
 )
```

Parameters

index

Index of the skip range.

start

Beginning of the skip range.

end

End of the skip range.

Remarks

Start is guaranteed to be smaller or equal to end.

EWedgeGauge.HitTest

Checks whether the cursor is positioned over a handle (true) or not (false).

Namespace: Euresys.Open_eVision

```
[C#]
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

true if the daughters gauges handles have to be considered as well.

EWedgeGauge.HVConstraint

Status of the restriction on the orientation of the point location gauge or model fitting sample paths.

Namespace: Euresys.Open_eVision

[C#]

```
bool HVConstraint
  { get; set; }
```

Remarks

Sample paths are the point location gauges placed along the model to be fitted.

EWedgeGauge.Measure

Triggers the point location or the model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void Measure(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Pointer to the source image.

region

Region to use with the source image.

Remarks

When this method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

EWedgeGauge.MeasuredWedge

Information pertaining to the fitted wedge.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EWedge MeasuredWedge
  { get; }
```

Remarks

Use method EShape::GetFound to get the status of the measurement.
EWedgeGauge::MeasuredWedge returns a successful fitted wedge if EShape::GetFound is true, otherwise it returns the orginal (nominal) wedge.

EWedgeGauge.MeasureSample

Computes the sample points along the sample path whose index in the list is given by the pathIndex parameter.

Namespace: Euresys.Open_eVision

```
[C#]
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 uint pathIndex
 )
void MeasureSample(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 uint pathIndex
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

pathIndex

Sample path index.

region

Region on which to measure.

Remarks

This method stores its results into a temporary variable inside the EWedgeGauge object.

EWedgeGauge.MeasureWithoutFitting

Triggers the point location without wedge fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage
 )
void MeasureWithoutFitting(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region
 )
```

Parameters

sourceImage

Source image.

region

-

Remarks

This method performs the actual measurement for each transition, but does not perform the wedge fitting. This means that individual samples will be available for each edges through the EWedgeGauge::GetSamplea (Edge a), EWedgeGauge::GetSampler (Edge r), EWedgeGauge::GetSampleA (Edge A), EWedgeGauge::GetSampleR (Edge R) methods, but the gauge position will not be changed.
Please note that the filtering will not be performed in this method, since it relies upon the fitting process. The filtering parameters will thus be unused.

EWedgeGauge.MinAmplitude

Offset added to the Threshold when a peak is to be detected.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinAmplitude
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value.
To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected.
When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

EWedgeGauge.MinArea

Minimum area value.

Namespace: Euresys.Open_eVision

[C#]

```
uint MinArea
  { get; set; }
```

Remarks

A transition is detected if its derivative peak reaches Threshold + MinAmplitude value, and then declared valid if the area between the peak curve and the horizontal at level Threshold reaches the MinArea value.

EWedgeGauge.NumFilteringPasses

Number of filtering passes for a model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumFilteringPasses
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation. During a filtering pass, the points that are too distant from the model are discarded. During a model fitting operation, the "filtering" process can be invoked to remove outliers, i.e. points that were located significantly far away from the fitted model (so that their position is dubious). By default (the number of filtering passes is 0), the outliers rejection process is disabled.

EWedgeGauge.NumSamples

Number of sampled points during the model fitting operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation.
After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

EWedgeGauge.NumSamplesA

This property is deprecated.

Number of sampled points found on edge A during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesA
  { get; }
```

Remarks

Deprecation notice: Use EWedgeGauge instead.

EWedgeGauge.NumSamplesA

This property is deprecated.

Number of sampled points found on edge A during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesA
  { get; }
```

Remarks

Deprecation notice: Use EWedgeGauge instead.

EWedgeGauge.NumSamplesInnerEdge

Number of sampled points found on inner edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesInnerEdge
  { get; }
```

EWedgeGauge.NumSamplesLeftEdge

Number of sampled points found on leftmost edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesLeftEdge
  { get; }
```

EWedgeGauge.NumSamplesOuterEdge

Number of sampled points found on outer edge during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesOuterEdge
  { get; }
```

EWedgeGauge.NumSamplesR

This property is deprecated.

Number of sampled points found on edge R during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesR
  { get; }
```

Remarks

Deprecation notice: Use EWedgeGauge instead.

EWedgeGauge.NumSamplesR

This property is deprecated.

Number of sampled points found on edge R during the measure operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint NumSamplesR
  { get; }
```

Remarks

Deprecation notice: Use EWedgeGauge instead.

EWedgeGauge.NumSamplesRightEdge

Number of sampled points found on rightmost edge during the measure operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumSamplesRightEdge
  { get; }
```

EWedgeGauge.NumSkipRanges

Number of skip ranges in the gauge after a call to EWedgeGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumSkipRanges
  { get; }
```

EWedgeGauge.NumValidSamples

Number of valid sample points remaining after a model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumValidSamples
  { get; }
```

Remarks

Irrelevant in case of a point location operation. After a model fitting operation, a number of points have been fitted along the model. Among them, some are not reliable because of their Area value. Among the remaining ones, some are filtered out (NumFilteringPasses, FilteringThreshold).

EWedgeGauge.operator=

Copies all the data from another EWedgeGauge object into the current EWedgeGauge object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EWedgeGauge operator=(
 Euresys.Open_eVision.EWedgeGauge other
 )
```

Parameters

other

EWedgeGauge object to be copied

EWedgeGauge.Plot

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void Plot(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )

void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )

void Plot(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

drawItems
Boolean combination of EPlotItem members, that indicates which items must be displayed.

width
Width of the plot.

height
Height of the plot.

originX
Origin point coordinates of the plot along the X axis.

originY
Origin point coordinates of the plot along the Y axis.

color

The color in which to draw the overlay.

Remarks

The sample path that is taken into considered is the one inspected with the last call to EWedgeGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call EWedgeGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWedgeGauge.PlotWithCurrentPen

This method is deprecated.

Draws the profile that is crossed by one of the sample paths of the gauge, as defined by EPlotItem.

Namespace: Euresys.Open_eVision

[C#]

```
void PlotWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EPlotItem drawItems,
 float width,
 float height,
 float originX,
 float originY
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawItems

Boolean combination of EPlotItem members, that indicates which items must be displayed.

width

Width of the plot.

height

Height of the plot.

originX

Origin point coordinates of the plot along the X axis.

originY

Origin point coordinates of the plot along the Y axis.

Remarks

The sample path that is taken into considered is the one inspected with the last call to EWedgeGauge::MeasureSample.

Note. For this method to succeed, it is necessary to previously call EWedgeGauge::MeasureSample.
Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWedgeGauge.Process

Triggers the process pertaining to a shape or gauge and all the daughter gauges attach to it.

Namespace: Euresys.Open_eVision

[C#]

```
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool daughters
 )
void Process(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.ERegion region,
 bool daughters
 )
```

Parameters

sourceImage

Pointer to the source image.

daughters

Flag indicating whether the daughters shapes inherit of the same behavior.

region

Region to use with the source image.

Remarks

When complex gauging is required, several gauges can be grouped together. Applying Process to the mother gauge or shape triggers the measurement of the whole. Only the active gauges will participate in the process.

EWedgeGauge.RectangularSamplingArea

Flag indicating whether the sampling area remains a rectangle when rotated, instead of becoming a parallelogram.

Namespace: Euresys.Open_eVision

[C#]

```
bool RectangularSamplingArea
```

```
{ get; set; }
```

Remarks

By default, this flag is set to true: the sampling area always remains a rectangle. Setting this property is only useful when the thickness transition parameter is greater than 1. In fact, when thickness transition parameter is equal to 1, rectangle and parallelogram reduce to the same segment.

EWedgeGauge.RemoveAllSkipRanges

Removes all the skip ranges previously created by a call to EWedgeGauge::AddSkipRange.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveAllSkipRanges(
 )
```

EWedgeGauge.RemoveSkipRange

After a call to EWedgeGauge::AddSkipRange, removes the skip range with the given index.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveSkipRange(
 uint index
 )
```

Parameters

index

Index of the skip range to remove, as returned by EWedgeGauge::AddSkipRange.

EWedgeGauge.SamplingStep

Approximate distance between sampled points during a model fitting operation.

Namespace: Euresys.Open_eVision

[C#]

```
float SamplingStep
  { get; set; }
```

Remarks

Irrelevant in case of a point location operation.
To fit a model, a series of point location operations are performed along the model. The point location gauges spacing is given by the sampling step.
By default, the sampling step is set to 5, which means 5 pixels when the field of view is not calibrated, and 5 physical units in case of a calibrated field of view.
Be aware that if the sampling step is too large, the number of sampled points along the model will not be sufficient enough to accurately locate it.

EWedgeGauge.SetDiameters

Sets the nominal inner/outer diameter and breadth of the EWedgeGauge.

Namespace: Euresys.Open_eVision

[C#]

```
void SetDiameters(
 float diameter,
 float breadth
 )
```

Parameters

diameter

Outer diameter of the EWedgeGauge. The default value is 100.

breadth

Breadth of the EWedgeGauge. It must be negative or zero. Its default value is -50.

Remarks

A EWedgeGauge is fully defined knowing its nominal position (given by the coordinates of its center), its nominal outer radius (diameter), its breadth, the angular position from where it extents, its angular amplitude and its outline tolerance.
By default, the EWedgeGauge diameter value is 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

EWedgeGauge.SetFromOriginMiddleEnd

Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeGauge object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 float breadth,
 bool fullCircle
 )
```

Parameters

origin

Origin point coordinates of the wedge.

middle

Middle point coordinates of the wedge.

end

End point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

fullCircle

true (default) in case of a full turn wedge. If fullCircle is false, origin and end give the wedge's amplitude.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedgeGauge.SetFromTwoPoints

DEPRECATED (you should use EWedgeGauge): Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeGauge object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 float breadth,
 bool direct
 )
```

Parameters

center

Center coordinates of the wedge at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system and clockwise in an inverse coordinate system.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedgeGauge.SetMinNumFitSamples

Sets the minimum number of samples required for fitting on each side of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
void SetMinNumFitSamples(
 int side0,
 int side1,
 int side2,
 int side3
 )
```

Parameters

side0

Minimum number of samples on the *outer circle* of the wedge. The default value is 3.

side1

Minimum number of samples on the *original border* of the wedge. If this value is not specified, it is equal to n32Side0. The default value is 2.

side2

Minimum number of samples on the *inner circle* of the wedge. If this value is not specified, it is equal to n32Side0. The default value is 3.

side3

Minimum number of samples on the *end border* of the wedge. If this value is not specified, it is equal to n32Side1. The default value is 2.

Remarks

Irrelevant in case of a point location operation. When the EWedgeGauge::Measure method is called, and if not enough valid points are detected, then the method returns directly, and the measured gauge is set to the nominal parameters.

EWedgeGauge.SetRadii

Sets the nominal radius and breadth of the EWedgeGauge.

Namespace: Euresys.Open_eVision

```
[C#]
void SetRadii(
 float radius,
 float breadth
 )
```

Parameters

radius

Outer radius of the EWedgeGauge. The default value is 50.

breadth

Breadth of the EWedgeGauge, which must be negative or zero. Its default value is -50.

Remarks

A EWedgeGauge is fully defined knowing its nominal position (given by the coordinates of its center), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude and its outline tolerance.
By default, the EWedgeGauge radius value is 50, which means 50 pixels when the field of view is not calibrated and 50 "units" in case of a calibrated field of view.

EWedgeGauge.Smoothing

Number of pixels used for the low-pass filtering operation.

Namespace: Euresys.Open_eVision

```
[C#]
uint Smoothing
  { get; set; }
```

Remarks

To reduce the effect of noise, the profile data can be low-pass filtered along the point location gauge direction.

EWedgeGauge.Thickness

Number of parallel segments used to extract the data profile.

Namespace: Euresys.Open_eVision

```
[C#]
uint Thickness
  { get; set; }
```

Remarks

To reduce the effect of noise and/or strengthen a transition, several parallel profiles can be accumulated.

EWedgeGauge.Threshold

Threshold level used to delimit significant peaks in the data profile.

Namespace: Euresys.Open_eVision

[C#]

```
uint Threshold
  { get; set; }
```

Remarks

When analyzing a derivative profile, a peak is made up of consecutive pixel values above Threshold. To detect weak [strong] transitions, lower [raise] the Threshold value.
To avoid interference of noise, an additional parameter is provided. The MinAmplitude parameter is an offset added to Threshold when a peak is to be detected.
When the pixel values of the derivative profile do not reach Threshold + MinAmplitude, the peak is not taken into account. Anyway, when a peak is taken into account, all the pixels with values above Threshold are considered (for more accuracy). Setting the MinAmplitude value to 0 merely cancels its effect.

EWedgeGauge.Tolerance

Searching area half thickness of the wedge fitting gauge.

Namespace: Euresys.Open_eVision

[C#]

```
float Tolerance
  { get; set; }
```

Remarks

A wedge fitting gauge is fully defined knowing its nominal position (its center coordinates), its outer nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
By default, the searching area thickness of the wedge fitting gauge is 20 (2x10), which means 20 pixels when the field of view is not calibrated, and 20 physical units in case of a calibrated field of view.

EWedgeGauge.TransitionChoice

Transition choice.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ETransitionChoice TransitionChoice
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition.
In case of NthFromBegin or NthFromEnd transition choice, set EWedgeGauge::TransitionIndex to specify the desired transition.
By default, the selected transition corresponds to the one with the largest amplitude (LargestAmplitude).

EWedgeGauge.TransitionIndex

Index (from 0 on) of the transition to be retained when the transition choice parameter is set to NthFromBegin or NthFromEnd.

Namespace: Euresys.Open_eVision

[C#]

```
uint TransitionIndex
  { get; set; }
```

Remarks

Several peaks may be detected along a point location gauge. This parameter helps to select the desired transition.
By default, the first transition is retained (the index value is 0).

EWedgeGauge.TransitionType

Transition type.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ETransitionType TransitionType
  { get; set; }
```

Remarks

The type of a transition tells whether it crosses increasing or decreasing gray-level values. This helps discriminate between nearby edges of an object.
By default, the searched transition type is indifferently a black to white or a white to black transition (BwOrWb).

EWedgeGauge.Type

Shape type.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

EWedgeGauge.Valid

Flag indicating if at least one valid transition has been found.

Namespace: Euresys.Open_eVision

[C#]

```
bool Valid
  { get; }
```

Remarks

A false value means that no measurement has been performed. A true value means that a transition was found along the sample path inspected with the last call to EWedgeGauge::MeasureSample, and thus a point has been measured.

EWedgeGauge.Wedge

Sets the nominal position (center coordinates), diameter, breadth, angular origin and amplitude of the wedge fitting gauge according to a known wedge.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EWedge Wedge
  { get; set; }
```

4.255. EWedgeShape Class

Manages a wedge shape.

Base Class:EShape
Derived Class(es):EWedgeGauge
Namespace: Euresys.Open_eVision

Properties

Amplitude	Angular amplitude of the EWedgeShape.
Angle	Orientation of the shape.
ApexAngle	Angular position at the apex of the EWedgeShape.

Breadth	Breadth of the EWedgeShape.
Center	Center point of the shape.
CenterX	Abscissa of the origin point of the shape.
CenterY	Ordinate of the origin point of the shape.
Direct	Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.
EndAngle	Ending angular position of the EWedgeShape.
FullBreadth	Flag indicating if the EWedgeShape has a full breadth (breadth = radius).
FullCircle	Flag indicating if the EWedgeShape is a full circle (amplitude = 2 PI).
InnerApex	Inner apex point coordinates of the EWedgeShape.
InnerArcLength	Inner circle arc length of the EWedgeShape.
InnerDiameter	Inner diameter of the EWedgeShape.
InnerEnd	Inner end point coordinates of the EWedgeShape.
InnerOrg	Inner origin point coordinates of the EWedgeShape.
InnerRadius	Inner radius of the EWedgeShape
OrgAngle	Angular position from where the EWedgeShape extents.
OuterApex	Outer apex point coordinates of the EWedgeShape.
OuterArcLength	Outer circle arc length of the EWedgeShape.
OuterDiameter	Outer diameter of the EWedgeShape.
OuterEnd	Outer end point coordinates of the EWedgeShape.
OuterOrg	Outer origin point coordinates of the EWedgeShape.
OuterRadius	Outer radius of the EWedgeShape.
Scale	Horizontal sensor resolution, in pixels per unit.
Type	Shape type.
Wedge	Sets the nominal position, length and rotation angle of the wedge according to a known EWedge object.

Methods

Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
CopyTo	Copies all the data of the current EWedgeShape object into another EWedgeShape object and returns it.
Drag	Moves a handle to a new position and updates the position parameters of the shape.
Draw	Draws a graphical representation of a shape, as defined by EDrawingMode.

DrawWithCurrentPen	Draws a graphical representation of a shape, as defined by EDrawingMode.
GetCorners	Retrieves the coordinates of each corner of the EWedgeShape.
GetEdges	Retrieves each edge of the EWedgeShape.
GetInnerPoint	Returns the coordinates of a particular point specified by its location along the inner circle arc.
GetMidEdges	Retrieves the center coordinates of each edge of the wedge fitting gauge.
GetOuterPoint	Returns the coordinates of a particular point specified by its location along the outter circle arc.
GetPoint	Returns the coordinates of a particular point specified by its location along the wedge perimeter.
HitTest	Checks if there is a handle under the cursor.
operator=	Copies all the data from another EWedgeShape object into the current EWedgeShape object
SetCenterXY	Sets the center coordinates of a EWedgeShape object.
SetDiameters	Sets the nominal inner/outer diameter and breadth of the EWedgeShape.
SetFromCenterAndOrigin	Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeShape object.
SetFromOriginMiddleEnd	Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeShape object.
SetFromTwoPoints	DEPRECATED (you should use EWedgeShape::SetFromCenterAndOrigin): Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeShape object.
SetRadii	Sets the nominal radius and breadth of the EWedgeShape.

EWedgeShape.Amplitude

Angular amplitude of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float Amplitude
    { get; set; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedgeShape.Angle

Orientation of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

EWedgeShape.ApexAngle

Angular position at the apex of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float ApexAngle
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedgeShape.Breadth

Breadth of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
float Breadth
    { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.Center

Center point of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint Center
    { get; set; }
```

EWedgeShape.CenterX

Abscissa of the origin point of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterX
    { get; }
```

EWedgeShape.CenterY

Ordinate of the origin point of the shape.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterY
    { get; }
```

EWedgeShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

[C#]

```
void Closest(
 )
```

EWedgeShape.CopyTo

Copies all the data of the current EWedgeShape object into another EWedgeShape object and returns it.

Namespace: Euresys.Open_eVision

[C#]

```
void CopyTo(
 Euresys.Open_eVision.EWedgeShape dest,
 bool bRecursive
 )

Euresys.Open_eVision.EWedgeShape CopyTo(
 Euresys.Open_eVision.EWedgeShape dest,
 bool bRecursive
 )
```

Parameters

dest

Pointer to the EWedgeShape object in which the current EWedgeShape object data have to be copied.

bRecursive

true if the children shapes have to be copied as well, false otherwise.

Remarks

Deprecation notice: the overload taking and returning a pointer is deprecated. In that overload, in case of a NULL pointer, a new EWedgeShape object will be created and returned.

EWedgeShape.Direct

Flag indicating whether positive angles correspond to a clockwise or an anticlockwise rotation.

Namespace: Euresys.Open_eVision

[C#]

```
bool Direct
  { get; set; }
```

Remarks

true (default) means that angles increase anticlockwisely in a direct coordinate system, and clockwisely in an inverse coordinate system.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards.
* When the field of view is not calibrated, the coordinate system is said to be inverse the abscissa extends rightwards and the ordinate extends downwards.

EWedgeShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

EWedgeShape.Draw

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

```
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

color

The color to draw with.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWedgeShape.DrawWithCurrentPen

This method is deprecated.

Draws a graphical representation of a shape, as defined by EDrawingMode.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingMode,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingMode

Indicates how the point location or model fitting gauge must be displayed, as defined by EDrawingMode.

daughters

true if the daughters gauges are to be displayed also.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWedgeShape.EndAngle

Ending angular position of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float EndAngle
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedgeShape.FullBreadth

Flag indicating if the EWedgeShape has a full breadth (breadth = radius).

Namespace: Euresys.Open_eVision

[C#]

```
bool FullBreadth
  { get; }
```

EWedgeShape.FullCircle

Flag indicating if the EWedgeShape is a full circle (amplitude = 2 PI).

Namespace: Euresys.Open_eVision

[C#]

```
bool FullCircle
```

```
{ get; }
```

EWedgeShape.GetCorners

Retrieves the coordinates of each corner of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
void GetCorners(
 Euresys.Open_eVision.EPoint ar,
 Euresys.Open_eVision.EPoint AAr,
 Euresys.Open_eVision.EPoint aRR,
 Euresys.Open_eVision.EPoint AARR
 )
```

Parameters

ar

Coordinates of the inner org corner of the EWedgeShape.

AAr

Coordinates of the inner end corner of the EWedgeShape.

aRR

Coordinates of the outer org corner of the EWedgeShape.

AARR

Coordinates of the outer end corner of the EWedgeShape.

EWedgeShape.GetEdges

Retrieves each edge of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
void GetEdges(
 Euresys.Open_eVision.ELine a,
 Euresys.Open_eVision.ELine AA,
 Euresys.Open_eVision.ECircle r,
 Euresys.Open_eVision.ECircle RR
 )
```

Parameters

a
Org edge of the EWedgeShape.

AA
End edge of the EWedgeShape.

r
Inner edge of the EWedgeShape.

RR
Outer edge of the EWedgeShape.

EWedgeShape.GetInnerPoint

Returns the coordinates of a particular point specified by its location along the inner circle arc.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetInnerPoint(
 float fraction
 )
```

Parameters

fraction
Point location expressed as a fraction of the circle arc (range [-1, +1]).

EWedgeShape.GetMidEdges

Retrieves the center coordinates of each edge of the wedge fitting gauge.

Namespace: Euresys.Open_eVision

[C#]

```
void GetMidEdges(
 Euresys.Open_eVision.EPoint a,
 Euresys.Open_eVision.EPoint AA,
 Euresys.Open_eVision.EPoint r,
 Euresys.Open_eVision.EPoint RR
 )
```

Parameters

a
Center coordinates of the org edge of the EWedgeShape.

AA
Center coordinates of the end edge of the EWedgeShape.

r
Center coordinates of the inner edge of the EWedgeShape.

RR
Center coordinates of the outer edge of the EWedgeShape.

EWedgeShape.GetOuterPoint

Returns the coordinates of a particular point specified by its location along the outter circle arc.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetOuterPoint(
 float fraction
 )
```

Parameters

fraction
Point location expressed as a fraction of the circle arc (range [-1, +1]).

EWedgeShape.GetPoint

Returns the coordinates of a particular point specified by its location along the wedge perimeter.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint GetPoint(
 float breadthFraction,
 float angleFraction
 )
```

Parameters

breadthFraction
Point location expressed as a fraction of the wedge breadth (range -1, +1).

angleFraction
Point location expressed as a fraction of the wedge amplitude (range -1, +1).

EWedgeShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTest(
 bool daughters
 )
```

Parameters

daughters

-

EWedgeShape.InnerApex

Inner apex point coordinates of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint InnerApex
  { get; }
```

EWedgeShape.InnerArcLength

Inner circle arc length of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float InnerArcLength
  { get; }
```

EWedgeShape.InnerDiameter

Inner diameter of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float InnerDiameter
  { get; }
```

EWedgeShape.InnerEnd

Inner end point coordinates of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint InnerEnd
  { get; }
```

EWedgeShape.InnerOrg

Inner origin point coordinates of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint InnerOrg
  { get; }
```

EWedgeShape.InnerRadius

Inner radius of the EWedgeShape

Namespace: Euresys.Open_eVision

```
[C#]
float InnerRadius
  { get; }
```

EWedgeShape.operator=

Copies all the data from another EWedgeShape object into the current EWedgeShape object

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EWedgeShape operator=(
 Euresys.Open_eVision.EWedgeShape other
 )
```

Parameters

other

EWedgeShape object to be copied

EWedgeShape.OrgAngle

Angular position from where the EWedgeShape extents.

Namespace: Euresys.Open_eVision

[C#]

```
float OrgAngle
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.
The sign of the rotation angle depends whether the field of view is calibrated or not.
* When the field of view is calibrated, the coordinate system is said to be direct, the abscissa extends rightwards and the ordinate extends upwards. In this case, an anticlockwise rotation leads to a positive angle value.
* When the field of view is not calibrated, the coordinate system is said to be inverse, the abscissa extends rightwards and the ordinate extends downwards. In this case, a clockwise rotation leads to a positive angle value.

EWedgeShape.OuterApex

Outer apex point coordinates of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint OuterApex
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.OuterArcLength

Outer circle arc length of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float OuterArcLength
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.OuterDiameter

Outer diameter of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
float OuterDiameter
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.OuterEnd

Outer end point coordinates of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint OuterEnd
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.OuterOrg

Outer origin point coordinates of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint OuterOrg
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal outer radius (diameter), its breadth (must be negative), the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.OuterRadius

Outer radius of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
float OuterRadius
  { get; }
```

Remarks

A EWedgeShape is fully defined knowing its nominal position (its center coordinates), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude, and its outline tolerance.

EWedgeShape.Scale

Horizontal sensor resolution, in pixels per unit.

Namespace: Euresys.Open_eVision

[C#]

```
float Scale
  { get; set; }
```

EWedgeShape.SetCenterXY

Sets the center coordinates of a EWedgeShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Center coordinates of the EWedgeShape object.

centerY

Center coordinates of the EWedgeShape object.

EWedgeShape.SetDiameters

Sets the nominal inner/outer diameter and breadth of the EWedgeShape.

Namespace: Euresys.Open_eVision

```
[C#]
void SetDiameters(
 float diameter,
 float breadth
 )
```

Parameters

diameter

Outer diameter of the EWedgeShape. The default value is 100.

breadth

Breadth of the EWedgeShape. It must be negative or zero. Its default value is -50.

Remarks

A EWedgeShape is fully defined knowing its nominal position (given by the coordinates of its center), its nominal outer radius (diameter), its breadth, the angular position from where it extents, its angular amplitude and its outline tolerance.
By default, the EWedgeShape diameter value is 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

EWedgeShape.SetFromCenterAndOrigin

Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromCenterAndOrigin(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 float breadth,
 bool direct
 )
```

Parameters

center

Center coordinates of the wedge at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system and clockwise in an inverse coordinate system.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedgeShape.SetFromOriginMiddleEnd

Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeShape object.

Namespace: Euresys.Open_eVision

```
[C#]
void SetFromOriginMiddleEnd(
 Euresys.Open_eVision.EPoint origin,
 Euresys.Open_eVision.EPoint middle,
 Euresys.Open_eVision.EPoint end,
 float breadth,
 bool fullCircle
 )
```

Parameters

origin

Origin point coordinates of the wedge.

middle

Middle point coordinates of the wedge.

end

End point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

fullCircle

true (default) in case of a full turn wedge. If fullCircle is false, origin and end give the wedge's amplitude.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedgeShape.SetFromTwoPoints

This method is deprecated.

DEPRECATED (you should use EWedgeShape::SetFromCenterAndOrigin): Sets the geometric parameters (nominal position and diameter, breadth, angular position and amplitude) of an EWedgeShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFromTwoPoints(
 Euresys.Open_eVision.EPoint center,
 Euresys.Open_eVision.EPoint origin,
 float breadth,
 bool direct
 )
```

Parameters

center

Center coordinates of the wedge at its nominal position. The default value is (0,0).

origin

Origin point coordinates of the wedge.

breadth

Nominal breadth of the wedge. It must be negative or zero. The default value is -50.

direct

true (default) means that angles increase anticlockwise in a direct coordinate system and clockwise in an inverse coordinate system.

Remarks

In a direct coordinate system, the abscissa extends rightwards and the ordinate extends upwards. The coordinate system is said to be inverse if the abscissa extends rightwards and the ordinate extends downwards.

EWedgeShape.SetRadii

Sets the nominal radius and breadth of the EWedgeShape.

Namespace: Euresys.Open_eVision

[C#]

```
void SetRadii(
 float outerRadius,
 float breadth
 )
```

Parameters

outerRadius

Outer radius of the EWedgeShape. The default value is 50.

breadth

Breadth of the EWedgeShape, which must be negative or zero. Its default value is -50.

Remarks

A EWedgeShape is fully defined knowing its nominal position (given by the coordinates of its center), its nominal radius (diameter), its breadth, the angular position from where it extents, its angular amplitude and its outline tolerance.
By default, the EWedgeShape radius value is 50, which means 50 pixels when the field of view is not calibrated and 50 "units" in case of a calibrated field of view.

EWedgeShape.Type

Shape type.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

EWedgeShape.Wedge

Sets the nominal position, length and rotation angle of the wedge according to a known EWedge object.

Namespace: Euresys.Open_eVision

[C#]

```
virtual Euresys.Open_eVision.EWedge Wedge
  { get; set; }
```

4.256. EWindowsDrawAdapter Class

A draw adapter using the GDI+ native API on Windows. This class is only usable on Windows and all its methods will throw NotImplemented errors if used on another platform.

Base Class:EDrawAdapter
Derived Class(es):EGDIPlusDrawAdapter
Namespace: Euresys.Open_eVision

Properties

Brush	Default brush.
Font	Default font.
HDC	Gets the HDC associated with this instance of EWindowsDrawAdapter.
Pen	Default pen.

Methods

Arc	Draws an arc defined by a rectangle, angle, and amplitude.
BackedText	Draws a text with a background.
Close	Closes the attached drawing context, if the current instance was initialized from an image.
DrawPoint	Draws a point at the given coordinate.
Ellipse	Draws an ellipse.
EWindowsDrawAdapter	Creates an EWindowsDrawAdapter either by providing a drawing context or an image. If a drawing context is provided EWindowsDrawAdapter will forward all drawing commands to that drawing context. If an image is provided a drawing context will be initialized on that image and that drawing context will be closed either on destruction of the EWindowsDrawAdapter or when the EWindowsDrawAdapter::Close method is called.
FilledEllipse	Fills an ellipse.
FilledPolygon	Fills a polygon.
FilledRectangle	Fills a rectangle.
GetTextSize	Size of the given text using the default font (EWindowsDrawAdapter::Font).
Image	Draws an image.
Line	Draws a line between two points.
Polygon	Draws a polygon.
Rectangle	Draws a rectangle.
Text	Draws a text.
UseCurrentBrush	Use the current pen set in the drawing framework.
UseCurrentPen	Uses the current GDI pen.

EWindowsDrawAdapter.Arc

Draws an arc defined by a rectangle, angle, and amplitude.

Namespace: Euresys.Open_eVision

```
[C#]
void Arc(
 int orgX,
 int orgY,
 int width,
 int height,
 float startAngle,
 float amplitude,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
: X origin of the rectangle

orgY
: Y origin of the rectangle

width
: Width of the rectangle

height
: Height of the rectangle

startAngle
: Starting angle of the arc in radians

amplitude
: Amplitude of the arc in radians

pen
: Optional pen to use

EWindowsDrawAdapter.BackedText

Draws a text with a background.

Namespace: Euresys.Open_eVision

[C#]

```
void BackedText(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush,
 Euresys.Open_eVision.EBrush backgroundBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

orientation
Orientation of the text.

textBrush
Optional brush to use for the color of the text.

backgroundBrush
Optional brush to use for the background.

EWindowsDrawAdapter.Brush

Default brush.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EBrush Brush
  { get; set; }
```

EWindowsDrawAdapter.Close

Closes the attached drawing context, if the current instance was initialized from an image.

Namespace: Euresys.Open_eVision

[C#]

```
void Close(
 )
```

EWindowsDrawAdapter.DrawPoint

Draws a point at the given coordinate.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawPoint(
 int x1,
 int y1,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate

y1
Y coordinate

pen
Optional pen to use

EWindowsDrawAdapter.Ellipse

Draws an ellipse.

Namespace: Euresys.Open_eVision

```
[C#]
void Ellipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle containing the ellipse

orgY
Y origin of the rectangle containing the ellipse

width
Width of the rectangle containing the ellipse

height
Height of the rectangle containing the ellipse

pen
Optional pen to use

EWindowsDrawAdapter.EWindowsDrawAdapter

Creates an EWindowsDrawAdapter either by providing a drawing context or an image. If a drawing context is provided EWindowsDrawAdapter will forward all drawing commands to that drawing context. If an image is provided a drawing context will be initialized on that image and that drawing context will be closed either on destruction of the EWindowsDrawAdapter or when the EWindowsDrawAdapter::Close method is called.

Namespace: Euresys.Open_eVision

[C#]

```
void EWindowsDrawAdapter(
 IntPtr dc
 )

void EWindowsDrawAdapter(
 Euresys.Open_eVision.EImageBW8 pImage
 )

void EWindowsDrawAdapter(
 Euresys.Open_eVision.EImageC24 pImage
 )
```

Parameters

dc

The Windows API drawning context.

pImage

-

EWindowsDrawAdapter.FilledEllipse

Fills an ellipse.

Namespace: Euresys.Open_eVision

[C#]

```
void FilledEllipse(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
X origin of the rectangle containing the ellipse

orgY
Y origin of the rectangle containing the ellipse

width
Width of the rectangle containing the ellipse

height
Height of the rectangle containing the ellipse

pen
Optional pen to use for drawing the contour of the ellipse

brush
Optional pen to use for drawing the inside of the ellipse

EWindowsDrawAdapter.FilledPolygon

Fills a polygon.

Namespace: Euresys.Open_eVision

[C#]

```
void FilledPolygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

points
Points of the polygon

pen
Optional pen to use for drawing the contour of the polygon

brush
Optional pen to use for drawing the inside of the polygon

EWindowsDrawAdapter.FilledRectangle

Fills a rectangle.

Namespace: Euresys.Open_eVision

[C#]

```
void FilledRectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen,
 Euresys.Open_eVision.EBrush brush
 )
```

Parameters

orgX
: X origin of the rectangle

orgY
: Y origin of the rectangle

width
: Width of the rectangle

height
: Height of the rectangle

pen
: Optional pen to use for drawing the contour of the rectangle

brush
: Optional brush to use for filling the inside of the rectangle

EWindowsDrawAdapter.Font

Default font.

Namespace: Euresys.Open_eVision

[C#]

```
override Euresys.Open_eVision.EFont Font
  { get; set; }
```

EWindowsDrawAdapter.GetTextSize

Size of the given text using the default font (EWindowsDrawAdapter::Font).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint GetTextSize(
 string text
 )
```

Parameters

text

Text

EWindowsDrawAdapter.HDC

Gets the HDC associated with this instance of EWindowsDrawAdapter.

Namespace: Euresys.Open_eVision

[C#]

```
IntPtr HDC
  { get; }
```

EWindowsDrawAdapter.Image

Draws an image.

Namespace: Euresys.Open_eVision

[C#]

```
void Image(
 Euresys.Open_eVision.EBaseROI image,
 float orgX,
 float orgY,
 float width,
 float height
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EC24Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )

void Image(
 Euresys.Open_eVision.EROIBW8 image,
 Euresys.Open_eVision.EBW8Vector pColorScale,
 float orgX,
 float orgY,
 float width,
 float height
 )
```

Parameters

image
Image.
orgX
X coordinate of the point where to draw the image.
orgY
Y coordinate of the point where to draw the image.
width
Width of the destination rectangle in which to draw the image.
height
Height of the destination rectangle in which to draw the image.
pColorScale
Color scale to draw a grayscale image with.

EWindowsDrawAdapter.Line

Draws a line between two points.

Namespace: Euresys.Open_eVision

```
[C#]
void Line(
 int x1,
 int y1,
 int x2,
 int y2,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

x1
X coordinate of line origin point
y1
Y coordinate of line origin point
x2
X coordinate of line end point
y2
Y coordinate of line end point
pen
Optional pen to use

EWindowsDrawAdapter.Pen

Default pen.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EPen Pen
  { get; set; }
```

EWindowsDrawAdapter.Polygon

Draws a polygon.

Namespace: Euresys.Open_eVision

```
[C#]
void Polygon(
 Euresys.Open_eVision.EPoint[] points,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

points

Points of the polygon

pen

Optional pen to use

EWindowsDrawAdapter.Rectangle

Draws a rectangle.

Namespace: Euresys.Open_eVision

```
[C#]
void Rectangle(
 int orgX,
 int orgY,
 int width,
 int height,
 Euresys.Open_eVision.EPen pen
 )
```

Parameters

orgX
X origin of the rectangle

orgY
Y origin of the rectangle

width
Width of the rectangle

height
Height of the rectangle

pen
Optional pen to use

EWindowsDrawAdapter.Text

Draws a text.

Namespace: Euresys.Open_eVision

[C#]

```
void Text(
 string text,
 int x,
 int y,
 float orientation,
 Euresys.Open_eVision.EBrush textBrush
 )
```

Parameters

text
Text to draw.

x
X position of the text.

y
Y position of the text.

orientation
Orientation of the text in radians.

textBrush
Optional brush to use for the color of the text.

EWindowsDrawAdapter.UseCurrentBrush

Use the current pen set in the drawing framework.

Namespace: Euresys.Open_eVision

[C#]

```
void UseCurrentBrush(
 )
```

EWindowsDrawAdapter.UseCurrentPen

Uses the current GDI pen.

Namespace: Euresys.Open_eVision

[C#]

```
void UseCurrentPen(
 )
```

4.257. EWorldShape Class

Manages a complete context for calibrating a field of view.

Base Class:EShape

Namespace: Euresys.Open_eVision

Properties

Angle	Tilt X angle, that is the amplitude of the rotation applied around the X-axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.
CalibrationModes	Current calibration mode, made from a combination of values.
Center	Position of the origin point of the reference frame as projected onto the image, i.e. the Sensor position of the point at World coordinates (0,0).
CenterX	Horizontal position of the origin point of the reference frame as projected onto the image, i.e. the Sensor abscissa of the point at World coordinates (0,0).
CenterY	Vertical position of the origin point of the reference frame as projected onto the image, i.e. the Sensor ordinate of the point at World coordinates (0,0).
Distortion	Sets the optical distortion parameters
DistortionStrength	Sets the optical distortion parameters
FieldHeight	Field-of-view height, in physical units.
FieldWidth	Field-of-view width, in physical units.

GridPointsMaxVariation	Maximum variation of grid points (maximum distance between computed grid points and ideal grid points in world space), normalized using the pitch values, after a call to EWorldShape::CalibrationSucceeded
GridPointsMaxVariationThreshold	Grid points maximum variation threshold, that is the value above which the maximum variation of grid points (maximum distance between computed grid points and ideal grid points in world space) is considered too high, and thus marks the calibration as a failure when using EWorldShape::CalibrationSucceeded.
GridPointsMeanVariation	Mean variation of grid points (mean distance between computed grid points and ideal grid points in world space), normalized using the pitch values, after a call to EWorldShape::CalibrationSucceeded.
GridPointsMeanVariationThreshold	Grid points mean variation threshold, that is the value above which the mean variation of grid points (mean distance between computed grid points and ideal grid points in world space) is considered too high, and thus marks the calibration as a failure when using EWorldShape::CalibrationSucceeded.
HitLandmark	Returns the landmark selected by EWorldShape::HitLandmarks or ~0 if no landmark is selected.
NumLandmarkElements	Returns the number of landmark elements.
PanX	Current horizontal panning value for drawing operations, expressed in pixels. By default, no panning occurs.
PanY	Current vertical panning value for drawing operations, expressed in pixels. By default, no panning occurs.
PerspectiveStrength	Perspective effect coefficient, that is the inverse of the observation distance.
Ratio	XResolution/YResolution ratio.
Scale	The scale of the reference frame.
SensorHeight	Logical image height, that is the number of pixels vertically.
SensorWidth	Logical image width, that is the number of pixels horizontally.
TiltXAngle	Tilt X angle, that is the amplitude of the rotation applied around the X-axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.
TiltYAngle	Tilt Y angle, that is the amplitude of the rotation applied around the Y-axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.
Type	Shape type.
XResolution	Horizontal sensor resolution, in pixels per unit.
YResolution	Vertical sensor resolution, in pixels per unit.
ZoomX	Current horizontal zooming factor for drawing operations.
ZoomY	Current vertical zooming factor for drawing operations.

Methods

AddLandmark	Adds a new pair of points coordinates (in Sensor and World spaces) to the set of landmarks used for calibration.
AddPoint	Adds a new point coordinates (in Sensor space) to the set of grid points used for calibration.
AutoCalibrate	Returns the best calibration modes for the current calibration grid and calibrates the field of view accordingly.
AutoCalibrateDotGrid	Performs an automatic calibration based on a dot grid image.
AutoCalibrateLandmarks	Returns the best calibration modes for the current landmark set and calibrates the field of view accordingly.
Calibrate	Performs a calibration according to the specified combination of calibration modes.
CalibrationSucceeded	Getter method for the CalibrationSucceeded property. This property is the flag indicating if the calibration has succeeded (true), that is whether the mean variation of grid points (distance between computed grid points and ideal grid points in world space) and the maximum variation of grid points are between given tolerances.
Closest	Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.
DisableTypeFilter	Enables all shape types
Drag	Moves a handle to a new position and updates the position parameters of the shape.
DragLandmark	Moves the landmark to a new position.
Draw	Draws the world coordinate axis.
DrawCrossGrid	Draws a regular grid of crosses in world coordinates.
DrawCrossGridWithCurrentPen	Draws a regular grid of crosses in world coordinates.
DrawGrid	Draws the reconstructed grid to be used for grid calibration.
DrawGridWithCurrentPen	Draws the reconstructed grid to be used for grid calibration.
DrawLandmarks	Draws the landmarks to be used for landmark calibration.
DrawWithCurrentPen	Draws the world coordinate axis.
EmptyLandmarks	Resets the landmark specification sequence.
EnableTypeFilter	Enables the filter of the specified shape type
EWorldShape	Constructs a EWorldShape object.
GetLandmarkElement	Returns the landmark element corresponding to the given index.
HitLandmarks	Checks if the cursor is placed over a landmark point.
HitTest	Checks if there is a handle under the cursor.

operator=	Copies all the data from another EWorldShape object into the current EWorldShape object
RebuildGrid	Reconstructs the grid of points from the given dot centers, to compute the World coordinates of the points.
RemoveLandmark	Removes a landmark.
SensorToWorld	Performs coordinate transform for arbitrary points from Sensor space to World space.
SetCenterXY	Position of the origin point of the reference frame as projected onto the image, i.e. the Sensor position of the point at World coordinates (0,0).
SetFieldSize	Sets the field of view size in physical units.
SetPan	Sets the horizontal and vertical panning values for drawing operations, expressed in pixels.
SetPerspective	Sets the perspective effect coefficient, i.e. the inverse of the observation distance.
SetResolution	Sets the sensor resolution in pixels per unit in both directions.
SetSensor	Initializes the calibration object using all given parameters.
SetSensorSize	Sets the logical image size, i.e. the number of pixels horizontally and vertically.
SetSize	Sets the frame size.
SetupUnwarp	Prepares a lookup table for fast image unwarping.
SetZoom	Sets the horizontal and vertical zooming factors for drawing operations.
Unwarp	Unwarps a distorted image using the current calibration model.
WorldToSensor	Performs coordinate transform for arbitrary points from World space to Sensor space.

EWorldShape.AddLandmark

Adds a new pair of points coordinates (in Sensor and World spaces) to the set of landmarks used for calibration.

Namespace: Euresys.Open_eVision

[C#]

```
void AddLandmark(
 Euresys.Open_eVision.EPoint sensorPoint,
 Euresys.Open_eVision.EPoint worldPoint
 )
```

Parameters

sensorPoint

Sensor point coordinates.

worldPoint

Corresponding World point coordinates.

Remarks

Landmark calibration is the process of computing the calibration parameters by means of a set of known points for which the coordinates are available in both World and Sensor spaces. Usually, such points are chosen as salient features on the part or target in view. They must be such that appropriate image processing techniques allow measuring their positions from the image (directly or indirectly by geometric constructions), while at the same time their coordinates in a reference frame are known.

EWorldShape.AddPoint

Adds a new point coordinates (in Sensor space) to the set of grid points used for calibration.

Namespace: Euresys.Open_eVision

```
[C#]
void AddPoint(
 Euresys.Open_eVision.EPoint sensorPoint
 )
```

Parameters

sensorPoint

Sensor point coordinates.

Remarks

Grid calibration is the process of computing the calibration parameters by means of a set of points known to lie on a rectangular grid. If the grid pitch is known and one of the points is chosen as the origin point, the points can be used as landmarks. By contrast with the landmark calibration functions, the World coordinates of the grid points need not be specified, nor do they have to be given in any specific order. The calibration algorithm is capable of sorting out the points to reconstruct the grid topology. Typically, this function is used in conjunction with blob analysis to extract the dot centers from a grid of dots. Anyway, any other scheme can be used. The grid of points need not be complete, i.e. some of the nodes may be missing, and the points need not completely fill a rectangular area. Landmark calibration is simply achieved by providing a series of point coordinates (in Sensor space only) and then calling the grid reconstruction function followed by the calibration function.

EWorldShape.Angle

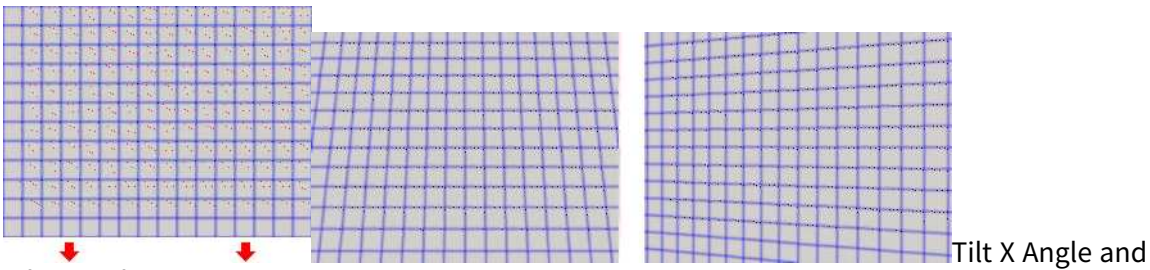
Tilt X angle, that is the amplitude of the rotation applied around the X-axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.

Namespace: Euresys.Open_eVision

[C#]

```
float Angle
  { get; set; }
```

Remarks


Tilt X Angle and Tilt Y Angle

EWorldShape.AutoCalibrate

Returns the best calibration modes for the current calibration grid and calibrates the field of view accordingly.

Namespace: Euresys.Open_eVision

[C#]

```
uint AutoCalibrate(
 bool testEmpiricalModes
 )
```

Parameters

testEmpiricalModes

Boolean indicating whether empirical calibration modes (Quadratic and Bilinear) should be considered when determining the best calibration modes.

Remarks

To ensure a successful calibration, the perspective angle of the view should not exceed 45 degrees.

EWorldShape.AutoCalibrateDotGrid

Performs an automatic calibration based on a dot grid image.

Namespace: Euresys.Open_eVision

```
[C#]
uint AutoCalibrateDotGrid(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 float columnPitch,
 float rowPitch,
 bool testEmpiricalModes
 )
```

Parameters

sourceImage

Pointer to the source image/ROI.

columnPitch

Actual pitches of the grid, i.e. distances between vertical and horizontal rows of the grid.

rowPitch

Actual pitches of the grid, i.e. distances between vertical and horizontal rows of the grid.

testEmpiricalModes

Boolean indicating whether empirical calibration modes (Quadratic and Bilinear) should be considered when determining the best calibration modes. Default value is false.

Remarks

Returns the best calibration mode for the current dot grid. The EWorldShape::AutoCalibrateDotGrid method will first do an automatic blob analysis in order to extract all dots (all blobs whose area is smaller than 5 pixels will be considered as noise and rejected). The dot gravity centers are used as the grid reference points. Then, the EWorldShape::AutoCalibrateDotGrid method will select and compute the best calibration mode by reducing the fitting error. To ensure a successful calibration, the perspective angle of the dot grid should not exceed 45 degrees.

EWorldShape.AutoCalibrateLandmarks

Returns the best calibration modes for the current landmark set and calibrates the field of view accordingly.

Namespace: Euresys.Open_eVision

```
[C#]
uint AutoCalibrateLandmarks(
 bool testEmpiricalModes
 )
```

Parameters

testEmpiricalModes

Boolean indicating whether empirical calibration modes (Quadratic and Bilinear) should be considered when determining the best calibration modes. Default value is false.

Remarks

Landmark calibration is the process of computing the calibration parameters by means of a set of known points for which the coordinates are available in both World and Sensor spaces. Usually, such points are chosen as salient features on the part or target in view. They must be such that appropriate image processing techniques allow measuring their positions from the image (directly or indirectly by geometric constructions), while at the same time their coordinates in a reference frame are known. To ensure a successful calibration, the perspective angle of the view should not exceed 45 degrees. The EWorldShape::AutoCalibrateLandmarks method is meant to be used with landmark calibration only. To calibrate automatically your field of view using a dot grid, use the EWorldShape::AutoCalibrate method instead.

EWorldShape.Calibrate

Performs a calibration according to the specified combination of calibration modes.

Namespace: Euresys.Open_eVision

[C#]

```
void Calibrate(
 uint calibrationModes
 )
```

Parameters

calibrationModes

Calibration modes, as defined by a combination of values from ECalibrationMode.

Remarks

Landmark calibration is the process of computing the calibration parameters by means of a set of known points for which the coordinates are available in both World and Sensor spaces. Usually, such points are chosen as salient features on the part or target in view. They must be such that appropriate image processing techniques allow measuring their positions from the image (directly or indirectly by geometric constructions), while at the same time their coordinates in a reference frame are known. In some cases, not all requested calibration modes are honored. After calibration, EWorldShape::CalibrationModes returns the actual combination of modes in effect. To ensure a successful calibration, the perspective angle of the view should not exceed 45 degrees.

EWorldShape.CalibrationModes

Current calibration mode, made from a combination of values.

Namespace: Euresys.Open_eVision

[C#]

```
uint CalibrationModes
  { get; set; }
```

Remarks

The supported calibration modes can be set to Raw, meaning that no calibration at all is performed (the World coordinates are pixel indices), or to the logical sum of other values from ECalibrationMode.

EWorldShape.CalibrationSucceeded

Getter method for the CalibrationSucceeded property. This property is the flag indicating if the calibration has succeeded (true), that is whether the mean variation of grid points (distance between computed grid points and ideal grid points in world space) and the maximum variation of grid points are between given tolerances.

Namespace: Euresys.Open_eVision

[C#]

```
bool CalibrationSucceeded(
 )
```

Remarks

The mean and maximum grid point variations are normalized using the pitch values. By default, tolerances are set to 0.05 (5 %) for the mean, and 0.1 (10 %) for the maximum grid point variation. You can get and set these tolerances using the EWorldShape::GridPointsMeanVariationThreshold and EWorldShape::GridPointsMaxVariationThreshold properties.

EWorldShape.Center

Position of the origin point of the reference frame as projected onto the image, i.e. the Sensor position of the point at World coordinates (0,0).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint Center
  { get; set; }
```

EWorldShape.CenterX

Horizontal position of the origin point of the reference frame as projected onto the image, i.e. the Sensor abscissa of the point at World coordinates (0,0).

Namespace: Euresys.Open_eVision

[C#]

```
float CenterX
  { get; }
```

EWorldShape.CenterY

Vertical position of the origin point of the reference frame as projected onto the image, i.e. the Sensor ordinate of the point at World coordinates (0,0).

Namespace: Euresys.Open_eVision

[C#]

```
float CenterY
  { get; }
```

EWorldShape.Closest

Find the daughter shape that is the closest to this shape. To retrieve the closest shape, use EShape::ClosestShape.

Namespace: Euresys.Open_eVision

[C#]

```
void Closest(
 )
```

EWorldShape.DisableTypeFilter

Enables all shape types

Namespace: Euresys.Open_eVision

[C#]

```
void DisableTypeFilter(
 )
```

EWorldShape.Distortion

This property is deprecated.

Sets the optical distortion parameters

Namespace: Euresys.Open_eVision

[C#]

```
float Distortion
  { get; set; }
```

Remarks

Deprecated in favor of EWorldShape::DistortionStrength.

EWorldShape.DistortionStrength

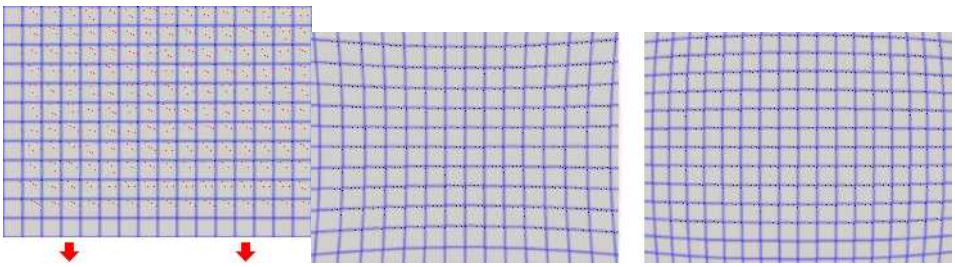
Sets the optical distortion parameters

Namespace: Euresys.Open_eVision

[C#]

```
float DistortionStrength
  { get; set; }
```

Remarks



<caption>Positive distortion and negative distortion</caption>

EWorldShape.Drag

Moves a handle to a new position and updates the position parameters of the shape.

Namespace: Euresys.Open_eVision

[C#]

```
void Drag(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

EWorldShape.DragLandmark

Moves the landmark to a new position.

Namespace: Euresys.Open_eVision

```
[C#]
void DragLandmark(
 int n32CursorX,
 int n32CursorY
 )
```

Parameters

n32CursorX

Current cursor coordinates.

n32CursorY

Current cursor coordinates.

EWorldShape.Draw

Draws the world coordinate axis.

Namespace: Euresys.Open_eVision

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingModes,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingModes,
 bool daughters
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 Euresys.Open_eVision.EDrawingMode drawingModes,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingModes

Indicates how the world coordinate axis must be displayed, as defined by EDrawingMode.

daughters

Indicates whether the daughter shapes are to be displayed as well.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.DrawCrossGrid

Draws a regular grid of crosses in world coordinates.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawCrossGrid(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float minimumX,
 float maximumX,
 float minimumY,
 float maximumY,
 uint numberOfIntervalsX,
 uint numberOfIntervalsY
 )

void DrawCrossGrid(
 IntPtr graphicContext,
 float minimumX,
 float maximumX,
 float minimumY,
 float maximumY,
 uint numberOfIntervalsX,
 uint numberOfIntervalsY
 )

void DrawCrossGrid(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color,
 float minimumX,
 float maximumX,
 float minimumY,
 float maximumY,
 uint numberOfIntervalsX,
 uint numberOfIntervalsY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

minimumX
Abscissa of the leftmost crosses, in world coordinates.

maximumX
Abscissa of the rightmost crosses, in world coordinates.

minimumY
Ordinate of the leftmost crosses, in world coordinates.

maximumY
Ordinate of the rightmost crosses, in world coordinates.

numberOfIntervalsX
Number of intervals between crosses along the horizontal direction.

numberOfIntervalsY
Number of intervals between crosses along the vertical direction.

color
The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.DrawCrossGridWithCurrentPen

This method is deprecated.

Draws a regular grid of crosses in world coordinates.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawCrossGridWithCurrentPen(
 IntPtr graphicContext,
 float minimumX,
 float maximumX,
 float minimumY,
 float maximumY,
 uint numberOfIntervalsX,
 uint numberOfIntervalsY
 )
```

Parameters

graphicContext
Handle of the device context on which to draw.

minimumX
Abscissa of the leftmost crosses, in world coordinates.

maximumX

Abscissa of the rightmost crosses, in world coordinates.

minimumY

Ordinate of the leftmost crosses, in world coordinates.

maximumY

Ordinate of the rightmost crosses, in world coordinates.

numberOfIntervalsX

Number of intervals between crosses along the horizontal direction.

numberOfIntervalsY

Number of intervals between crosses along the vertical direction.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.DrawGrid

Draws the reconstructed grid to be used for grid calibration.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawGrid(
 Euresys.Open_eVision.EDrawAdapter graphicContext
 )
void DrawGrid(
 IntPtr graphicContext
 )
void DrawGrid(
 IntPtr graphicContext,
 Euresys.Open_eVision.ERGBColor color
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

color

The color in which to draw the overlay.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.DrawGridWithCurrentPen

This method is deprecated.

Draws the reconstructed grid to be used for grid calibration.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawGridWithCurrentPen(
 IntPtr graphicContext
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.DrawLandmarks

Draws the landmarks to be used for landmark calibration.

Namespace: Euresys.Open_eVision

```
[C#]
void DrawLandmarks(
 Euresys.Open_eVision.EDrawAdapter graphicContext
 )

void DrawLandmarks(
 IntPtr graphicContext
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.DrawWithCurrentPen

This method is deprecated.

Draws the world coordinate axis.

Namespace: Euresys.Open_eVision

[C#]

```
void DrawWithCurrentPen(
 IntPtr graphicContext,
 Euresys.Open_eVision.EDrawingMode drawingModes,
 bool daughters
 )
```

Parameters

graphicContext

Handle of the device context on which to draw.

drawingModes

Indicates how the world coordinate axis must be displayed, as defined by EDrawingMode.

daughters

Indicates whether the daughter shapes are to be displayed as well.

Remarks

Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EWorldShape.EmptyLandmarks

Resets the landmark specification sequence.

Namespace: Euresys.Open_eVision

[C#]

```
void EmptyLandmarks(
 )
```

Remarks

Landmark calibration is the process of computing the calibration parameters by means of a set of known points for which the coordinates are available in both World and Sensor spaces. Usually, such points are chosen as salient features on the part or target in view. They must be such that appropriate image processing techniques allow measuring their positions from the image (directly or indirectly by geometric constructions), while at the same time their coordinates in a reference frame are known.

EWorldShape.EnableTypeFilter

Enables the filter of the specified shape type

Namespace: Euresys.Open_eVision

[C#]

```
void EnableTypeFilter(
 uint un32Types
 )
```

Parameters

un32Types

The type of the shape to filter from EShapeType.

EWorldShape.EWorldShape

Constructs a EWorldShape object.

Namespace: Euresys.Open_eVision

[C#]

```
void EWorldShape(
 Euresys.Open_eVision.EWorldShape other
 )
void EWorldShape(
 )
```

Parameters

other

Another EWorldShape object to be copied in the new EWorldShape object.

EWorldShape.FieldHeight

Field-of-view height, in physical units.

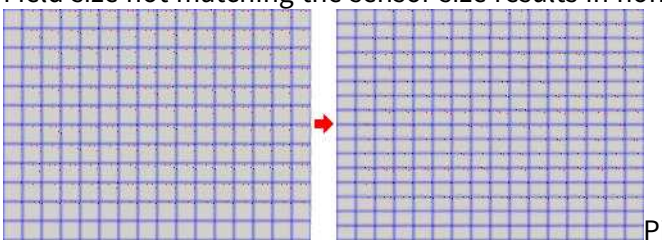
Namespace: Euresys.Open_eVision

[C#]

```
float FieldHeight
  { get; }
```

Remarks

Field size not matching the sensor size results in non-square pixels.

 Pixels having non-square aspect ratioBeware there is a restriction pertaining to the allowed image anisotropy. The resulting pixels aspect ratio (XResolution/YResolution) should be in the range [-4/3, -3/4] (or [3/4, 4/3]), otherwise the calibration process could fail.

EWorldShape.FieldWidth

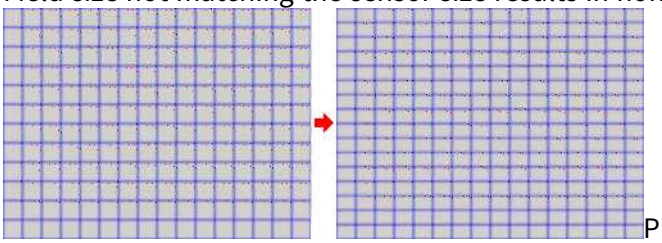
Field-of-view width, in physical units.

Namespace: Euresys.Open_eVision

```
[C#]
float FieldWidth
  { get; }
```

Remarks

Field size not matching the sensor size results in non-square pixels.

 Pixels having non-square aspect ratioBeware there is a restriction pertaining to the allowed image anisotropy. The resulting pixels aspect ratio (XResolution/YResolution) should be in the range [-4/3, -3/4] (or [3/4, 4/3]), otherwise the calibration process could fail.

EWorldShape.GetLandmarkElement

Returns the landmark element corresponding to the given index.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ELandmark GetLandmarkElement(
 uint i
 )

Euresys.Open_eVision.ELandmark GetLandmarkElement(
 uint i
 )
```

Parameters

i

Landmark index.

EWorldShape.GridPointsMaxVariation

Maximum variation of grid points (maximum distance between computed grid points and ideal grid points in world space), normalized using the pitch values, after a call to EWorldShape::CalibrationSucceeded

Namespace: Euresys.Open_eVision

[C#]

```
float GridPointsMaxVariation
  { get; }
```

Remarks

The maximum grid point variation is normalized using the pitch values.

EWorldShape.GridPointsMaxVariationThreshold

Grid points maximum variation threshold, that is the value above which the maximum variation of grid points (maximum distance between computed grid points and ideal grid points in world space) is considered too high, and thus marks the calibration as a failure when using EWorldShape::CalibrationSucceeded.

Namespace: Euresys.Open_eVision

[C#]

```
float GridPointsMaxVariationThreshold
  { get; set; }
```

Remarks

The maximum grid point variation is normalized using the pitch values.

EWorldShape.GridPointsMeanVariation

Mean variation of grid points (mean distance between computed grid points and ideal grid points in world space), normalized using the pitch values, after a call to EWorldShape::CalibrationSucceeded.

Namespace: Euresys.Open_eVision

[C#]

```
float GridPointsMeanVariation
  { get; }
```

Remarks

The mean grid point variation is normalized using the pitch values.

EWorldShape.GridPointsMeanVariationThreshold

Grid points mean variation threshold, that is the value above which the mean variation of grid points (mean distance between computed grid points and ideal grid points in world space) is considered too high, and thus marks the calibration as a failure when using EWorldShape::CalibrationSucceeded.

Namespace: Euresys.Open_eVision

[C#]

```
float GridPointsMeanVariationThreshold
  { get; set; }
```

Remarks

The mean grid point variation is normalized using the pitch values.

EWorldShape.HitLandmark

Returns the landmark selected by EWorldShape::HitLandmarks or ~0 if no landmark is selected.

Namespace: Euresys.Open_eVision

[C#]

```
uint HitLandmark
  { get; }
```

EWorldShape.HitLandmarks

Checks if the cursor is placed over a landmark point.

Namespace: Euresys.Open_eVision

[C#]

```
void HitLandmarks(
 )
```

Remarks

Landmark calibration is the process of computing the calibration parameters by means of a set of known points for which the coordinates are available in both World and Sensor spaces. Usually, such points are chosen as salient features on the part or target in view. They must be such that appropriate image processing techniques allow measuring their positions from the image (directly or indirectly by geometric constructions), while at the same time their coordinates in a reference frame are known.

EWorldShape.HitTest

Checks if there is a handle under the cursor.

Namespace: Euresys.Open_eVision

[C#]

```
bool HitTest(
 bool bDaughters
 )
```

Parameters

bDaughters

Indicates if the check must be done in the whole hierarchy or just this object.

EWorldShape.NumLandmarkElements

Returns the number of landmark elements.

Namespace: Euresys.Open_eVision

[C#]

```
uint NumLandmarkElements
  { get; }
```

EWorldShape.operator=

Copies all the data from another EWorldShape object into the current EWorldShape object

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EWorldShape operator=(
 Euresys.Open_eVision.EWorldShape other
 )
```

Parameters

other

EWorldShape object to be copied

EWorldShape.PanX

Current horizontal panning value for drawing operations, expressed in pixels. By default, no panning occurs.

Namespace: Euresys.Open_eVision

[C#]

```
override float PanX
  { get; }
```

EWorldShape.PanY

Current vertical panning value for drawing operations, expressed in pixels. By default, no panning occurs.

Namespace: Euresys.Open_eVision

[C#]

```
override float PanY
  { get; }
```

EWorldShape.PerspectiveStrength

Perspective effect coefficient, that is the inverse of the observation distance.

Namespace: Euresys.Open_eVision

[C#]

```
float PerspectiveStrength
  { get; }
```

Remarks

The larger this parameter, the more perceivable the perspective distortion will be. A NULL value corresponds to a telecentric lens.

EWorldShape.Ratio

XResolution/YResolution ratio.

Namespace: Euresys.Open_eVision

[C#]

```
float Ratio
  { get; set; }
```

Remarks

If Ratio equals -1 (or 1), pixels are square. Beware there is a restriction pertaining to the allowed image anisotropy. The resulting pixels aspect ratio (XResolution/YResolution) should be in the range [-4/3, -3/4] (or [3/4, 4/3]), otherwise the calibration process could fail.

EWorldShape.RebuildGrid

Reconstructs the grid of points from the given dot centers, to compute the World coordinates of the points.

Namespace: Euresys.Open_eVision

[C#]

```
uint RebuildGrid(
 float colPitch,
 float rowPitch,
 uint centerIndex,
 bool direct
 )
uint RebuildGrid(
 float colPitch,
 float rowPitch,
 Euresys.Open_eVision.EPoint worldCenter,
 uint centerIndex,
 bool direct
 )
```

Parameters

colPitch

Actual pitches of the grid, that are distances between vertical and horizontal rows of the grid.

rowPitch

Actual pitches of the grid, that are distances between vertical and horizontal rows of the grid.

centerIndex

Index of the grid point chosen as coordinate origin point. By default, the most central grid point.

direct

true if the world reference frame points upwards.

worldCenter

World coordinates of the starting grid point.

Remarks

This member function also returns the number of grid points that were connected. This prepares the calibration using landmarks (for use by member EWorldShape::Calibrate). Landmark calibration is the process of computing the calibration parameters by means of a set of known points for which the coordinates are available in both World and Sensor spaces. Usually, such points are chosen as salient features on the part or target in view. They must be such that appropriate image processing techniques allow measuring their positions from the image (directly or indirectly by geometric constructions), while at the same time their coordinates in a reference frame are known. See also Dot-Grid-Based Calibration for the grid construction algorithm.

EWorldShape.RemoveLandmark

Removes a landmark.

Namespace: Euresys.Open_eVision

[C#]

```
void RemoveLandmark(
 uint index
 )
```

Parameters

index

Index of the landmark to be removed.

EWorldShape.Scale

The scale of the reference frame.

Namespace: Euresys.Open_eVision

[C#]

```
float Scale
  { get; set; }
```

EWorldShape.SensorHeight

Logical image height, that is the number of pixels vertically.

Namespace: Euresys.Open_eVision

[C#]

```
int SensorHeight
  { get; }
```

EWorldShape.SensorToWorld

Performs coordinate transform for arbitrary points from Sensor space to World space.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EPoint SensorToWorld(
 Euresys.Open_eVision.EPoint sensorPoint
 )
```

Parameters

sensorPoint

Sensor point.

EWorldShape.SensorWidth

Logical image width, that is the number of pixels horizontally.

Namespace: Euresys.Open_eVision

[C#]

```
int SensorWidth
  { get; }
```

EWorldShape.SetCenterXY

Position of the origin point of the reference frame as projected onto the image, i.e. the Sensor position of the point at World coordinates (0,0).

Namespace: Euresys.Open_eVision

[C#]

```
void SetCenterXY(
 float centerX,
 float centerY
 )
```

Parameters

centerX

Horizontal position (abscissa)

centerY

Vertical position (ordinate)

EWorldShape.SetFieldSize

Sets the field of view size in physical units.

Namespace: Euresys.Open_eVision

[C#]

```
void SetFieldSize(
 float width,
 float height
 )
```

Parameters

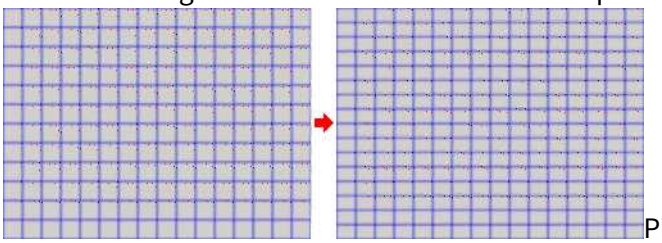
width

Full image physical width, in length units.

height

Full image physical height, in length units. If not specified, same as physical width.

Remarks

Field size not matching the sensor size results in non-square pixels. By default, the pixels are square.  Pixels having non-square aspect ratioBeware there is a restriction pertaining to the allowed image anisotropy. The resulting pixels aspect ratio (XResolution/YResolution) should be in the range [-4/3, -3/4] (or [3/4, 4/3]), otherwise the calibration process could fail.

EWorldShape.SetPan

Sets the horizontal and vertical panning values for drawing operations, expressed in pixels.

Namespace: Euresys.Open_eVision

```
[C#]
void SetPan(
 float panX,
 float panY
 )
```

Parameters

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

Remarks

All objects attached to an EWorldShape object inherit of the same panning factor.

EWorldShape.SetPerspective

Sets the perspective effect coefficient, i.e. the inverse of the observation distance.

Namespace: Euresys.Open_eVision

[C#]

```
void SetPerspective(
 float tiltXAngle,
 float tiltYAngle,
 float perspectiveStrength
 )
```

Parameters

tiltXAngle

Tilt angles, i.e. the amplitudes of the rotations applied around the X and Y axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.

tiltYAngle

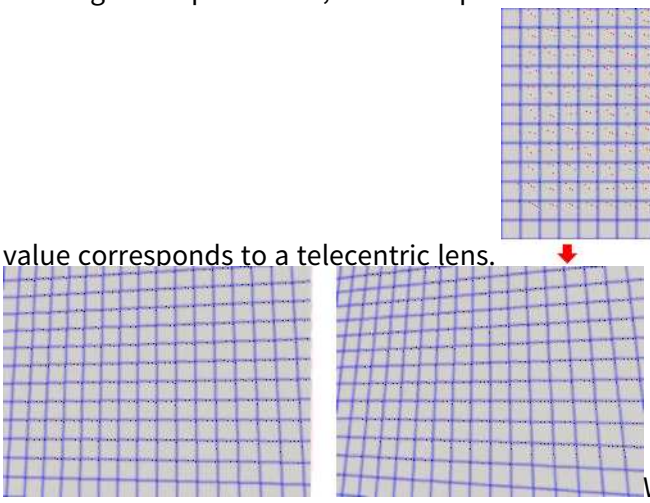
Tilt angles, i.e. the amplitudes of the rotations applied around the X and Y axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.

perspectiveStrength

Perspective effect coefficient.

Remarks

The larger this parameter, the more perceivable the perspective distortion will be. A NULL value corresponds to a telecentric lens.



Weak Perspective and Strong Perspective

EWorldShape.SetResolution

Sets the sensor resolution in pixels per unit in both directions.

Namespace: Euresys.Open_eVision

[C#]

```
void SetResolution(
 float resolutionX,
 float resolutionY
 )
```

Parameters

resolutionX

Horizontal resolution in pixels per units

resolutionY

Vertical resolution in pixels per units. If not specified, same as horizontal resolution.

Remarks

By default, the pixels are square.

EWorldShape.SetSensor

Initializes the calibration object using all given parameters.

Namespace: Euresys.Open_eVision

```
[C#]
void SetSensor(
 int sensorWidth,
 int sensorHeight,
 float fieldWidth,
 float fieldHeight,
 float centerX,
 float centerY,
 float angle,
 float tiltXAngle,
 float tiltYAngle,
 float perspectiveStrength,
 float distortionStrength,
 float opticalCenterX,
 float opticalCenterY,
 uint calibrationModes
 )
```

Parameters

sensorWidth

Logical size of the field of view, i.e. image size, in pixels.

sensorHeight

Logical size of the field of view, i.e. image size, in pixels.

fieldWidth

Physical size of the field of view. By default (argument omitted), the pixels are square.

fieldHeight

Physical size of the field of view. By default (argument omitted), the pixels are square.

centerX

Position of the "intersection" between the optical axis and the field of view in the image. By default, if the calibration modes contain Raw, it is set to 0. Otherwise, it is set to the image center.

centerY

Position of the "intersection" between the optical axis and the field of view in the image. By default, if the calibration modes contain Raw, it is set to 0 (or to the bottommost pixel index if the calibration modes also contain Inverse). Otherwise, it is set to the image center.

angle

Skew angle, i.e. angle formed by the axis of reference and the image edges. By default (argument omitted), no skewing effect is assumed.

tiltXAngle

Rotation angles on the X axis to bring the optical axis perpendicular to the image plane. By default (argument omitted), no perspective effect is assumed.

tiltYAngle

Rotation angles on the Y axis to bring the optical axis perpendicular to the image plane. By default (argument omitted), no perspective effect is assumed.

perspectiveStrength

Relative importance of the perspective effect. By default, no perspective effect is assumed, as if the lens was telecentric.

distortionStrength

Relative importance of the lens radial distortion. Positive for barrel, negative for cushion. By default (argument omitted), no optical distortion is assumed.

opticalCenterX

X Position of the "intersection" between the optical axis and the field of view in the image. By default (argument omitted) the image center.

opticalCenterY

Y Position of the "intersection" between the optical axis and the field of view in the image. By default (argument omitted) the image center.

calibrationModes

Desired calibration mode effects to be combined, as defined by ECalibrationMode. By default (argument omitted), the simplest model compatible with the given parameters is chosen.

Remarks

The function automatically selects the appropriate calibration model by checking the parameters. The use of a more complex calibration mode can be enforced by means of parameter EWorldShape::CalibrationModes, not a simpler one.

EWorldShape.SetSensorSize

Sets the logical image size, i.e. the number of pixels horizontally and vertically.

Namespace: Euresys.Open_eVision

[C#]

```
void SetSensorSize(
 int width,
 int height
 )
```

Parameters

width

Full image logical sizes, in pixels.

height

Full image logical sizes, in pixels.

EWorldShape.SetSize

Sets the frame size.

Namespace: Euresys.Open_eVision

```
[C#]
void SetSize(
 float sizeX,
 float sizeY
 )
```

Parameters

sizeX

Frame X-axis length. The default value is 100.

sizeY

Frame Y-axis length. By default, both axes have the same length.

Remarks

By default, both frame axis value are set to 100, which means 100 pixels when the field of view is not calibrated and 100 "units" in case of a calibrated field of view.

EWorldShape.SetupUnwarp

Prepares a lookup table for fast image unwarping.

Namespace: Euresys.Open_eVision

```
[C#]
void SetupUnwarp(
 Euresys.Open_eVision.EUnwarpingLut lookupTable,
 Euresys.Open_eVision.EROIBW8 sourceImage,
 bool interpolate
 )
void SetupUnwarp(
 Euresys.Open_eVision.EUnwarpingLut lookupTable,
 Euresys.Open_eVision.EROIC24 sourceImage,
 bool interpolate
 )
```

Parameters

lookupTable

Pointer to the lookup table.

sourceImage

Pointer to the source image/ROI.

interpolate

Interpolation mode. Default value is false.

Remarks

The function should be called each time the system is re-calibrated (after the optical setup has been changed, for instance). A sample source image has to be supplied to EWorldShape::SetupUnwarp, and its row pitch is recorded in order to speedup the unwarping process. This implies that the following calls to EWorldShape::Unwarp are not allowed to use images with row pitches different from the source image initially supplied to EWorldShape::SetupUnwarp.

EWorldShape.SetZoom

Sets the horizontal and vertical zooming factors for drawing operations.

Namespace: Euresys.Open_eVision

[C#]

```
void SetZoom(
 float zoomX,
 float zoomY
 )
```

Parameters

zoomX

Horizontal zooming factor. By default, true scale is used.

zoomY

Vertical zooming factor. If set to 0, the default value, the horizontal zooming factor is used instead, so as to provide isotropic zooming.

Remarks

All objects attached to an EWorldShape inherit of the same zooming factor.

EWorldShape.TiltXAngle

Tilt X angle, that is the amplitude of the rotation applied around the X-axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.

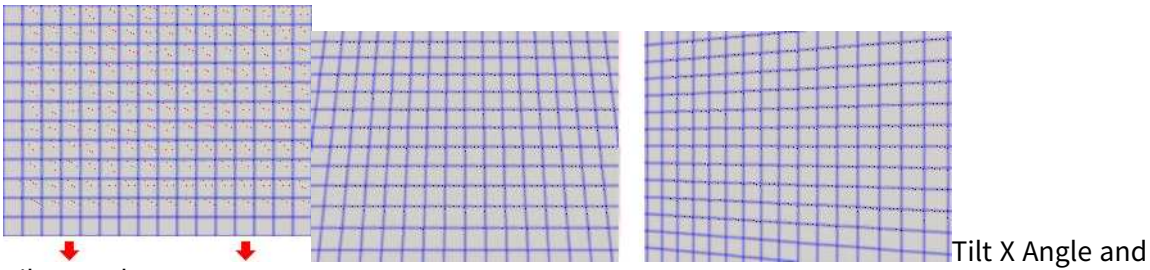
Namespace: Euresys.Open_eVision

[C#]

```
float TiltXAngle
```

```
{ get; }
```

Remarks



Tilt Y Angle

Tilt X Angle and

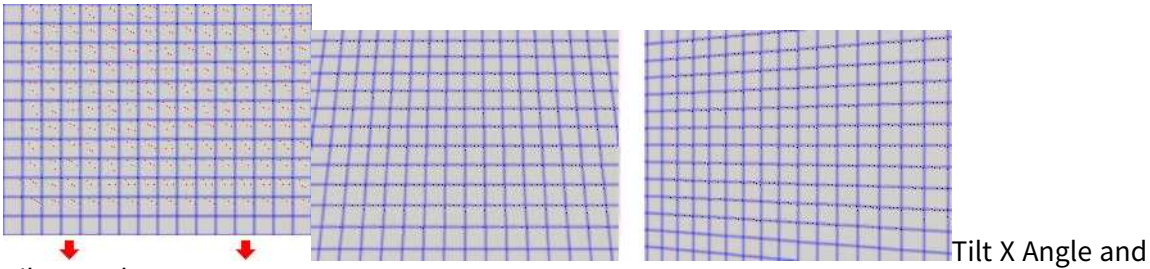
EWorldShape.TiltYAngle

Tilt Y angle, that is the amplitude of the rotation applied around the Y-axis of the sensor to bring the optical (Z) axis perpendicular to the field of view.

Namespace: Euresys.Open_eVision

```
[C#]
float TiltYAngle
  { get; }
```

Remarks



Tilt Y Angle

Tilt X Angle and

EWorldShape.Type

Shape type.

Namespace: Euresys.Open_eVision

```
[C#]
override Euresys.Open_eVision.EShapeType Type
  { get; }
```

EWorldShape.Unwarp

Unwarps a distorted image using the current calibration model.

Namespace: Euresys.Open_eVision

```
[C#]
void Unwarp(
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool interpolate
 )
void Unwarp(
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool interpolate
 )
void Unwarp(
 Euresys.Open_eVision.EUnwarpingLut lookupTable,
 Euresys.Open_eVision.EROIBW8 sourceImage,
 Euresys.Open_eVision.EROIBW8 destinationImage,
 bool interpolate
 )
void Unwarp(
 Euresys.Open_eVision.EUnwarpingLut lookupTable,
 Euresys.Open_eVision.EROIC24 sourceImage,
 Euresys.Open_eVision.EROIC24 destinationImage,
 bool interpolate
 )
```

Parameters

sourceImage
Pointer to the source image/ROI.

destinationImage
Pointer to the destination unwarped image.

interpolate
Interpolation mode. Default value is false.

lookupTable
Pointer to the lookup table.

Remarks

Using a precomputed lookup table allows speeding up the unwarping process. The lookup table is initialized by means of the EWorldShape::SetupUnwarp function.

EWorldShape.WorldToSensor

Performs coordinate transform for arbitrary points from World space to Sensor space.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPoint WorldToSensor(
 Euresys.Open_eVision.EPoint worldPoint
 )
```

Parameters

worldPoint

World point.

EWorldShape.XResolution

Horizontal sensor resolution, in pixels per unit.

Namespace: Euresys.Open_eVision

```
[C#]
float XResolution
  { get; }
```

EWorldShape.YResolution

Vertical sensor resolution, in pixels per unit.

Namespace: Euresys.Open_eVision

```
[C#]
float YResolution
  { get; }
```

EWorldShape.ZoomX

Current horizontal zooming factor for drawing operations.

Namespace: Euresys.Open_eVision

```
[C#]
override float ZoomX
  { get; }
```

EWorldShape.ZoomY

Current vertical zooming factor for drawing operations.

Namespace: Euresys.Open_eVision

```
[C#]
override float ZoomY
  { get; }
```

4.258. EZMap Class

Represents a generic ZMap type interface.

Derived Class(es):EZMap16EZMap32fEZMap8

Namespace: Euresys.Open_eVision.Easy3D

Properties

Height	Access ZMap Height.
MapToWorldMatrix	E3DTransformMatrix that transforms positions from the EZMap space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.
RowPitch	Returns the buffer row pitch.
Type	Pixel accessor type.
Width	Access ZMap Width.
WorldShape	Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap in real space coordinates (e.g mm).
WorldToMapMatrix	Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.
XResolution	Resolution of the EZMap along the X axis The resolution is the number of metric units per pixel.
YResolution	Resolution of the EZMap along the Y axis The resolution is the number of metric units per pixel.
ZResolution	Resolution of the EZMap along the Z axis The resolution is the number of metric units per grey value.

Methods

AddMetadata	Adds a metadata key (name) and value. If the metadata key already exists, its value will be overwritten.
Clear	Clears the ZMap: replaces all pixels with the undefined value.

Create	Factory method to allocates and reads a ZMap from a file. Depending of the serialized EZMap type, it returns the corresponding EZMap8, EZMap16 or EZMap32f object. The allocated EZMap must be released after use.
Draw	Draws an EZMap in a device context.
DrawImage	Displays the internal image buffer
GetBufferPtr	Retrieves the pointer to the internal pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer to the pixel buffer.
GetMetadata	Returns the string value of the given metadata. Throws an exception if it does not exist.
GetResolution	Gets the resolution of the EZMap along the X, Y and Z axis. On the Z axis, the resolution is the number of metric units per grey value. On the X and Y axis, the resolution is the number of metric units per pixel.
GetSizeInWorld	Returns the dimensions of the EZMap in real world space (e.g metric unit).
GetWorldPositionFromMapPosition	Returns the 3D world position corresponding to a EZMap 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap, otherwise an exception will be thrown.
GetWorldPositionFromPixelPosition	Returns the 3D world position corresponding to a EZMap pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.
GetZMapPositionFromPixelPosition	Returns the corresponding EZMap 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.
ImageToWorld	Transforms a floating point (sub)pixel image position to a 3D world position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The pixel Z value is in grey scale values (its range depends on the ZMap type).
ImageToZMap	Converts a 2D image (sub)pixel coordinate to the EZMap space. (u,v) is the pixel position (with its origin in the upper left corner of the image). (x,y) is the corresponding ZMap position (which has the same scale as the world space). All values are expressed in floating point numbers.
IsVoid	Tests if the EZMap object size is zero.

Load	Restores the EZMap stored in the given Open eVision file.
LoadImage	Restores the EZMap image stored in the given image file.
LoadImageAndMetadata	Loads image format and Metadata in JSON format.
LoadMetadata	Loads Metadata in JSON format.
ResetWorldTransformation	Reset the world transformation, Map to World and World to Map matrices become identity matrix.
Save	Saves the EZMap object to the given Open eVision file.
SaveImage	Saves the EZMap image to the given image file.
SaveImageAndMetadata	Saves image format and Metadata JSON format.
SaveMetadata	Saves Metadata in JSON format.
SetBufferPtr	Sets the pointer to an externally allocated image buffer.
SetResolution	Sets the resolution of the EZMap along the X, Y and Z axis. On the Z axis, the resolution is the number of metric units per grey value. On the X and Y axis, the resolution is the number of metric units per pixel.
SetSize	Sets the width and height of the EZMap.
WorldToImage	Transforms a 3D world position to a floating point (sub)pixel image position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The Z value is given in grey scale value. Returns true if the pixel position is inside the image limits and the Z value is positive. The parameter pixelPt is filled even if the point is outside the image.
WorldToZMap	Transforms a 3D world position to a 3D EZMap position. The ZMap space origin is at the lower left corner of the image. The scales of the world space and ZMap space are the same.
ZMapToImage	Converts a 2D coordinate in the EZMap space to image (sub)pixel space. (x,y) is the ZMap position (which has the same scale as the world space). (u,v) is the corresponding pixel position (with its origin in the upper left corner of the image). All values are expressed in floating point numbers. Returns true if the pixel position is inside the image limits.
ZMapToWorld	Transforms a 3D EZMap position to a 3D world space position. The ZMap space origin is at the lower left corner of the image.

EZMap.AddMetadata

Adds a metadata key (name) and value.
If the metadata key already exists, its value will be overwritten.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EZMap.Clear

Clears the ZMap: replaces all pixels with the undefined value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Clear(
 )
```

EZMap.Create

Factory method to allocates and reads a ZMap from a file. Depending of the serialized EZMap type, it returns the corresponding EZMap8, EZMap16 or EZMap32f object. The allocated EZMap must be released after use.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EZMap Create(
 string path
 )
```

Parameters

path

Full path to the file.

EZMap.Draw

Draws an EZMap in a device context.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the ZMap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A ZMap can be drawn (its pixels rendered) using a device context. EZMap::Draw and EZMap::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context. EZMap::Draw and EZMap::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap.GetBufferPtr

Retrieves the pointer to the internal pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetBufferPtr(
 )

IntPtr GetBufferPtr(
 int x,
 int y
 )

IntPtr GetBufferPtr(
 )
```

```
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel which we want the address.

y

Row of the pixel which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EZMap.GetCheckedBufferPtr

Retrieves the pointer to the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

EZMap.GetMetadata

Returns the string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
string GetMetadata(
 string Key
 )
```

Parameters

Key
The name of an existing metadata.

EZMap.GetResolution

Gets the resolution of the EZMap along the X, Y and Z axis.
On the Z axis, the resolution is the number of metric units per grey value.
On the X and Y axis, the resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetResolution(
 )
void GetResolution(
 ref float sx,
 ref float sy,
 ref float sz
 )
```

Parameters

sx
Contains the resolution along the X axis.

sy
Contains the resolution along the Y axis.

sz
Contains the resolution along the Z axis.

EZMap.GetSizeInWorld

Returns the dimensions of the EZMap in real world space (e.g metric unit).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetSizeInWorld(
 ref float worldWidth,
 ref float worldHeight
 )
```

Parameters

worldWidth

Contains the size of the ZMap along the X axis (column).

worldHeight

Contains the size of the ZMap along the Y axis (row).

EZMap.GetWorldPositionFromMapPosition

Returns the 3D world position corresponding to a EZMap 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromMapPosition(
 float x,
 float y
 )
```

Parameters

x

The X coordinate.

y

The Y coordinate.

EZMap.GetWorldPositionFromPixelPosition

Returns the 3D world position corresponding to a EZMap pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap.GetZMapPositionFromPixelPosition

Returns the corresponding EZMap 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.E3DPoint GetZMapPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap.Height

Access ZMap Height.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract int Height
  { get; set; }
```

EZMap.ImageToWorld

Transforms a floating point (sub)pixel image position to a 3D world position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The pixel Z value is in grey scale values (its range depends on the ZMap type).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ImageToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint pixelPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

pixelPt

Position in the image space.

worldPt

Position in the 3D world space.

EZMap.ImageToZMap

Converts a 2D image (sub)pixel coordinate to the EZMap space.
(u,v) is the pixel position (with its origin in the upper left corner of the image).
(x,y) is the corresponding ZMap position (which has the same scale as the world space).
All values are expressed in floating point numbers.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ImageToZMap(
 float u,
 float v,
 ref float x,
 ref float y
 )
```

Parameters

u

X Coordinate of the pixel as a floating point value.

v

Y Coordinate of the pixel as a floating point value.

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

EZMap.IsVoid

Tests if the EZMap object size is zero.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool IsVoid(
 )
```

Remarks

Returns true if the ZMap size is zero.

EZMap.Load

Restores the EZMap stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path to the file.

serializer

-

Remarks

When loading, the ZMap is resized if needed. This function restores all the ZMap attributes.

EZMap.LoadImage

Restores the EZMap image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the ZMap is resized if needed. This function does not restore the ZMap attributes, only the image associated with the EZMap is updated.

EZMap.LoadImageAndMetadata

Loads image format and Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string pathImage,
 string pathMetadata
 )
```

Parameters

pathImage

Full path to the file.

pathMetadata

Full path to the file.

EZMap.LoadMetadata

Loads Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path

Full path to the file.

EZMap.MapToWorldMatrix

E3DTransformMatrix that transforms positions from the EZMap space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract Euresys.Open_eVision.Easy3D.E3DTransformMatrix MapToWorldMatrix
  { get; set; }
```

EZMap.ResetWorldTransformation

Reset the world transformation, Map to World and World to Map matrices become identity matrix.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ResetWorldTransformation(
 )
```

EZMap.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract int RowPitch
  { get; }
```

EZMap.Save

Saves the EZMap object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )
```

```
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This format save the EZMap in a Open eVision file. This function stores all the ZMap attributes.

EZMap.SaveImage

Saves the EZMap image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This format save the image associated to EZMap in a standard image file and thus does not store ZMap attributes.

EZMap.SaveImageAndMetadata

Saves image format and Metadata JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string pathImage,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

pathImage

The full path to the destination file.

pathMetadata

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

EZMap.SaveMetadata

Saves Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EZMap.SetBufferPtr

Sets the pointer to an externally allocated image buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the data.

bitsPerRow

The total number of bits contained in a row, padding included.
Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EZMap::SetBufferPtr.

EZMap.SetResolution

Sets the resolution of the EZMap along the X, Y and Z axis.
On the Z axis, the resolution is the number of metric units per grey value.
On the X and Y axis, the resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetResolution(
 Euresys.Open_eVision.Easy3D.E3DPoint resolution
 )
void SetResolution(
 float rx,
 float ry,
 float rz
 )
```

Parameters

resolution

Contains the resolution along the X,Y and Z axis.

rx

Contains the resolution along the X axis.

ry

Contains the resolution along the Y axis.

rz

Contains the resolution along the Z axis.

EZMap.SetSize

Sets the width and height of the EZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetSize(
 int width,
 int height
 )
void SetSize(
 Euresys.Open_eVision.Easy3D.EZMap other
 )
```

Parameters

width

The new requested width.

height

The new requested height.

other

The other ZMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new image buffer (deallocate the old image buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new Open eVision image buffer and setting its size creates a 4-byte aligned buffer, by default. The *size of an ZMap* is specified as a number of columns (width) and rows (height).
The maximum image dimensions are 32767 by 32767. Furthermore, it must fit into the available memory, that depends upon the physical memory, the operating system and the memory already allocated by the process in other modules or libraries.

EZMap.Type

Pixel accessor type.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract Euresys.Open_eVision.EImageType Type
  { get; }
```

EZMap.Width

Access ZMap Width.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract int Width
```

```
{ get; set; }
```

EZMap.WorldShape

Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap in real space coordinates (e.g mm).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract Euresys.Open_eVision.EWorldShape WorldShape
  { get; }
```

EZMap.WorldToImage

Transforms a 3D world position to a floating point (sub)pixel image position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The Z value is given in grey scale value.
Returns true if the pixel position is inside the image limits and the Z value is positive.
The parameter pixelPt is filled even if the point is outside the image.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool WorldToImage(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint pixelPt
 )
```

Parameters

worldPt

Position in the 3D world space.

pixelPt

Position in the image space.

EZMap.WorldToMapMatrix

Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract Euresys.Open_eVision.Easy3D.E3DTransformMatrix WorldToMapMatrix
  { get; set; }
```

EZMap.WorldToZMap

Transforms a 3D world position to a 3D EZMap position.
The ZMap space origin is at the lower left corner of the image.
The scales of the world space and ZMap space are the same.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void WorldToZMap(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint zmapPt
 )
```

Parameters

worldPt

Position in the 3D world space.

zmapPt

Position in the ZMap space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap.XResolution

Resolution of the EZMap along the X axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract float XResolution
  { get; set; }
```

EZMap.YResolution

Resolution of the EZMap along the Y axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
abstract float YResolution
  { get; set; }
```

EZMap.ZMapToImage

Converts a 2D coordinate in the EZMap space to image (sub)pixel space.
(x,y) is the ZMap position (which has the same scale as the world space).
(u,v) is the corresponding pixel position (with its origin in the upper left corner of the image).
All values are expressed in floating point numbers.
Returns true if the pixel position is inside the image limits.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ZMapToImage(
 float x,
 float y,
 ref float u,
 ref float v
 )
```

Parameters

x
Position along horizontal axis in the ZMap space.

y
Position along vertical axis in the ZMap space.

u
Column of the pixel as a floating point value.

v
Row of the pixel as a floating point value.

EZMap.ZMapToWorld

Transforms a 3D EZMap position to a 3D world space position.
The ZMap space origin is at the lower left corner of the image.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ZMapToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint zmapPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

zmapPt

Position in the ZMap space.

worldPt

Position in the 3D world space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap.ZResolution

Resolution of the EZMap along the Z axis
The resolution is the number of metric units per grey value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
abstract float ZResolution
  { get; set; }
```

4.259. EZMap16 Class

A ZMap16 is a 16bits corrected 2.5D image.
ZMap Pixel values (16 bits integers) represent distances from a 3D reference plane.
Distances are positive, during the ZMap generation all points below the reference plane are discarded.
The EZMap class also stores the transformation from the pixel coordinates to the real world coordinate system.
There could be undefined pixels in the ZMap.

Base Class:EZMap

Namespace: Euresys.Open_eVision.Easy3D

Properties

Height	Access ZMap Height.
MapToWorldMatrix	E3DTransformMatrix that transforms positions from the EZMap16 space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.
RowPitch	Returns the buffer row pitch.
Type	Pixel accessor type.
UndefinedValue	Returns the Undefined value. That value is used to set to mark pixels with no valid depth value.

Width	Access ZMap Width.
WorldShape	Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap16 in real space coordinates (e.g mm).
WorldToMapMatrix	Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap16 space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.
XResolution	Resolution of the EZMap16 along the X axis The resolution is the number of metric units per pixel.
YResolution	Resolution of the EZMap16 along the Y axis The resolution is the number of metric units per pixel.
ZResolution	Resolution of the EZMap16 along the Z axis The resolution is the number of metric units per grey value.

Methods

AddMetadata	Adds a metadata key (name) and value. If the metadata key already exists, its value will be overwritten.
AsEImage	Returns the EZMap16 as an EImageBW16 (16 bits gray scale) to use with existing eVision 2D tools.
Clear	Clears the ZMap: replaces all pixels with the undefined value.
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Buffer coordinates
ConvertCoordinatesPixelToMap	Converts Buffer coordinates to 3D Map coordinates
CopyMetadataTo	Copies all metadata.
DeleteMetadata	Deletes value of this existing metadata key . Throws an exception if it does not exist.
Draw	Draws an EZMap16 in a device context.
DrawImage	Displays the internal image buffer
EZMap16	Creates a 16 bits EZMap.
FillUndefinedPixels	Fills undefined pixels, used to fill the "holes" in the ZMap.
FillUndefinedPixelsWithMedian	Fills undefined pixels, used to fill the "holes" in the ZMap using a median rectangular kernel of odd size.
GetBufferPtr	Retrieves the pointer to the internal pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer to the pixel buffer.
GetMetadata	Returns the string value of the given metadata. Throws an exception if it does not exist.
GetPixel	Gets the value of a pixel .

GetPixelPositionFromWorldPosition	Returns in the u, v and value parameters the EZMap16 values corresponding to a 3D world position. The world position is projected on the ZMap reference plane to get a position in the ZMap. If the projected position is outside the ZMap, the method returns false.
GetResolution	Gets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.
GetSizeInWorld	Returns the dimensions of the EZMap16 in real world space (e.g metric unit).
GetWorldPositionFromMapPosition	Returns the 3D world position corresponding to a EZMap16 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap16, otherwise an exception will be thrown.
GetWorldPositionFromPixelPosition	Returns the 3D world position corresponding to a EZMap16 pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.
GetZMapPositionFromPixelPosition	Returns the corresponding EZMap16 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.
GetZRange	Compute the minimum and maximum pixel values, excluding the undefined pixels.
GetZValue	Gets Z value (in metric coordinate) at pixel coordinates.
ImageToWorld	Transforms a floating point (sub)pixel image position to a 3D world position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The pixel Z value is in grey scale values (its range depends on the ZMap type).
ImageToZMap	Converts a 2D image (sub)pixel coordinate to the EZMap16 space. (u,v) is the pixel position (with its origin in the upper left corner of the image). (x,y) is the corresponding ZMap position (which has the same scale as the world space). All values are expressed in floating point numbers.
IsVoid	Tests if the EZMap16 object size is zero.
Load	Restores the EZMap16 stored in the given Open eVision file.
LoadImage	Restores the EZMap16 image stored in the given image file.
LoadImageAndMetadata	Loads image format and Metadata in JSON format.

LoadMetadata	Loads Metadata in JSON format.
ModifyMetadata	Changes an existing metadata key and value. Throws an exception if it does not exist.
operator=	Assignment operator.
ResetWorldTransformation	Reset the world transformation, Map to World and World to Map matrices become identity matrix.
Save	Saves the EZMap16 object to the given Open eVision file.
SaveImage	Saves the EZMap16 image to the given image file.
SaveImageAndMetadata	Saves image format and Metadata JSON format.
SaveMetadata	Saves Metadata in JSON format.
SetBufferPtr	Sets the pointer to an externally allocated image buffer.
SetPixel	Sets the value of a pixel .
SetResolution	Sets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.
SetSize	Sets the width and height of the EZMap16.
SetZValue	Sets Z value (in metric coordinate) at pixel coordinates.
WorldToImage	Transforms a 3D world position to a floating point (sub)pixel image position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The Z value is given in grey scale value. Returns true if the pixel position is inside the image limits and the Z value is positive. The parameter pixelPt is filled even if the point is outside the image.
WorldToZMap	Transforms a 3D world position to a 3D EZMap16 position. The ZMap space origin is at the lower left corner of the image. The scales of the world space and ZMap space are the same.
ZMapToImage	Converts a 2D coordinate in the EZMap16 space to image (sub)pixel space. (x,y) is the ZMap position (which has the same scale as the world space). (u,v) is the corresponding pixel position (with its origin in the upper left corner of the image). All values are expressed in floating point numbers. Returns true if the pixel position is inside the image limits.
ZMapToWorld	Transforms a 3D EZMap16 position to a 3D world space position. The ZMap space origin is at the lower left corner of the image.

EZMap16.AddMetadata

Adds a metadata key (name) and value.
If the metadata key already exists, its value will be overwritten.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EZMap16.AsEImage

Returns the EZMap16 as an EImageBW16 (16 bits gray scale) to use with existing eVision 2D tools.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EImageBW16 AsEImage(
 )

Euresys.Open_eVision.EImageBW16 AsEImage(
 )
```

EZMap16.Clear

Clears the ZMap: replaces all pixels with the undefined value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Clear(
 )
```

EZMap16.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearMetadata(
 )
```

EZMap16.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Buffer coordinates

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D

The Map X coordinate.

y3D

The Map Y coordinate.

xBuffer

The returned Pixel X coordinate.

yBuffer

The returned Pixel Y coordinate.

EZMap16.ConvertCoordinatesPixelToMap

Converts Buffer coordinates to 3D Map coordinates

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer
The pixel X coordinate.

yBuffer
The pixel Y coordinate.

x3D
The returned Map X coordinate.

y3D
The returned Map Y coordinate.

EZMap16.CopyMetadataTo

Copies all metadata.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void CopyMetadataTo(
 Euresys.Open_eVision.Easy3D.EZMap16 other
 )
```

Parameters

other
An other EZMap16.

EZMap16.DeleteMetadata

Deletes value of this existing metadata key . Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DeleteMetadata(
 string Key
 )
```

Parameters

Key
-

EZMap16.Draw

Draws an EZMap16 in a device context.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the ZMap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A ZMap can be drawn (its pixels rendered) using a device context. EZMap16::Draw and EZMap16::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap16.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context. EZMap16::Draw and EZMap16::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap16.EZMap16

Creates a 16 bits EZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EZMap16(
 )

void EZMap16(
 int width,
 int height
 )
```

```
void EZMap16(
 Euresys.Open_eVision.Easy3D.EZMap16 other
 )
```

Parameters

width
The width of the new ZMap.

height
The height of the new ZMap.

other
Another ZMap.

EZMap16.FillUndefinedPixels

Fills undefined pixels, used to fill the "holes" in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillUndefinedPixels(
 Euresys.Open_eVision.Easy3D.EZMap16 outMap,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

outMap
The destination ZMap.

direction
Direction in which the undefined pixels are filled in a ZMap from EFillUndefinedPixelsDirection.

method
Which values used to fill the undefined pixels in a ZMap from EFillUndefinedPixelsMethod.

EZMap16.FillUndefinedPixelsWithMedian

Fills undefined pixels, used to fill the "holes" in the ZMap using a median rectangular kernel of odd size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void FillUndefinedPixelsWithMedian(
 Euresys.Open_eVision.Easy3D.EZMap16 outMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

outMap

The destination ZMap.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 2).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth).

EZMap16.GetBufferPtr

Retrieves the pointer to the internal pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel which we want the address.

y

Row of the pixel which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EZMap16.GetCheckedBufferPtr

Retrieves the pointer to the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

EZMap16.GetMetadata

Returns the string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EZMap16.GetPixel

Gets the value of a pixel .

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth16 GetPixel(
 int x,
 int y
 )
```

Parameters

x
Column of the pixel.

y
Row of the pixel.

EZMap16.GetPixelPositionFromWorldPosition

Returns in the u, v and value parameters the EZMap16 values corresponding to a 3D world position.
The world position is projected on the ZMap reference plane to get a position in the ZMap.
If the projected position is outside the ZMap, the method returns false.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool GetPixelPositionFromWorldPosition(
 Euresys.Open_eVision.Easy3D.E3DPoint world_position,
 ref int u,
 ref int v,
 ref Euresys.Open_eVision.EDepth16 value
 )
```

Parameters

world_position
The 3D coordinates of a world position.

u
Column of the ZMap pixel in [0,width[.

v
Row of the ZMap pixel in [0,height[.

value
Value of the pixel.

EZMap16.GetResolution

Gets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel.
For the Z axis it is expressed in metric units per grey scale value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetResolution(
 ref float sx,
 ref float sy,
 ref float sz
 )

Euresys.Open_eVision.Easy3D.E3DPoint GetResolution(
 )
```

Parameters

sx
Resolution along the X axis.

sy
Resolution along the Y axis.

sz
Resolution along the Z axis.

EZMap16.GetSizeInWorld

Returns the dimensions of the EZMap16 in real world space (e.g metric unit).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetSizeInWorld(
 ref float worldWidth,
 ref float worldHeight
 )
```

Parameters

worldWidth
Contains the size of the ZMap along the X axis (column).

worldHeight
Contains the size of the ZMap along the Y axis (row).

EZMap16.GetWorldPositionFromMapPosition

Returns the 3D world position corresponding to a EZMap16 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap16, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromMapPosition(
 float x,
 float y
 )
```

Parameters

x

The X coordinate.

y

The Y coordinate.

EZMap16.GetWorldPositionFromPixelPosition

Returns the 3D world position corresponding to a EZMap16 pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap16.GetZMapPositionFromPixelPosition

Returns the corresponding EZMap16 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetZMapPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap16.GetZRange

Compute the minimum and maximum pixel values, excluding the undefined pixels.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetZRange(
 ref Euresys.Open_eVision.EBW16 min,
 ref Euresys.Open_eVision.EBW16 max
 )
```

Parameters

min

The lowest pixel value.

max

The highest pixel value.

EZMap16.GetZValue

Gets Z value (in metric coordinate) at pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float GetZValue(
 int x,
 int y
 )
```

Parameters

x
X Coordinate.

y
Y Coordinate.

EZMap16.Height

Access ZMap Height.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Height
  { get; set; }
```

EZMap16.ImageToWorld

Transforms a floating point (sub)pixel image position to a 3D world position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The pixel Z value is in grey scale values (its range depends on the ZMap type).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ImageToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint pixelPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

pixelPt
Position in the image space.

worldPt
Position in the 3D world space.

EZMap16.ImageToZMap

Converts a 2D image (sub)pixel coordinate to the EZMap16 space.
(u,v) is the pixel position (with its origin in the upper left corner of the image).
(x,y) is the corresponding ZMap position (which has the same scale as the world space).
All values are expressed in floating point numbers.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ImageToZMap(
 float u,
 float v,
 ref float x,
 ref float y
 )
```

Parameters

u

X Coordinate of the pixel as a floating point value.

v

Y Coordinate of the pixel as a floating point value.

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

EZMap16.IsVoid

Tests if the EZMap16 object size is zero.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsVoid(
 )
```

Remarks

Returns true if the ZMap size is zero.

EZMap16.Load

Restores the EZMap16 stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path to the file.

serializer

-

Remarks

When loading, the ZMap is resized if needed. This function restores all the ZMap attributes.

EZMap16.LoadImage

Restores the EZMap16 image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the ZMap is resized if needed. This function does not restore the ZMap attributes, only the image associated with the EZMap16 is updated.

EZMap16.LoadImageAndMetadata

Loads image format and Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string path,
 string pathMetadata
 )
```

Parameters

path

-

pathMetadata

Full path to the file.

EZMap16.LoadMetadata

Loads Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path

Full path to the file.

EZMap16.MapToWorldMatrix

E3DTransformMatrix that transforms positions from the EZMap16 space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.E3DTransformMatrix MapToWorldMatrix
  { get; set; }
```

EZMap16.ModifyMetadata

Changes an existing metadata key and value. Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key

-

value

-

EZMap16.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EZMap16 operator=(
 Euresys.Open_eVision.Easy3D.EZMap16 other
 )
```

Parameters

other

The source EZMap16.

EZMap16.ResetWorldTransformation

Reset the world transformation, Map to World and World to Map matrices become identity matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ResetWorldTransformation(
 )
```

EZMap16.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int RowPitch
  { get; }
```

EZMap16.Save

Saves the EZMap16 object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This format save the EZMap16 in a Open eVision file. This function stores all the ZMap attributes.

EZMap16.SaveImage

Saves the EZMap16 image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This format save the image associated to EZMap16 in a standard image file and thus does not store ZMap attributes.

EZMap16.SaveImageAndMetadata

Saves image format and Metadata JSON format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveImageAndMetadata(
 string path,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

path

-

pathMetadata

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

EZMap16.SaveMetadata

Saves Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EZMap16.SetBufferPtr

Sets the pointer to an externally allocated image buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the data.

bitsPerRow

The total number of bits contained in a row, padding included.
Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EZMap16::SetBufferPtr.

EZMap16.SetPixel

Sets the value of a pixel .

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EDepth16 value,
 int x,
 int y
 )
```

Parameters

value
Value of the pixel.

x
Column of the pixel.

y
Row of the pixel.

EZMap16.SetResolution

Sets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetResolution(
 float rx,
 float ry,
 float rz
 )
void SetResolution(
 Euresys.Open_eVision.Easy3D.E3DPoint resolution
 )
```

Parameters

rx
Resolution along the X axis.

ry
Resolution along the Y axis.

rz
Resolution along the Z axis.

resolution
Resolution for X,Y and Z axis.

EZMap16.SetSize

Sets the width and height of the EZMap16.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSize(
 int width,
 int height
 )
```

```
void SetSize(
 Euresys.Open_eVision.Easy3D.EZMap other
 )
```

Parameters

width

The new requested width.

height

The new requested height.

other

The other ZMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new image buffer (deallocate the old image buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new Open eVision image buffer and setting its size creates a 4-byte aligned buffer, by default. The *size of an ZMap* is specified as a number of columns (width) and rows (height).
The maximum image dimensions are 32767 by 32767. Furthermore, it must fit into the available memory, that depends upon the physical memory, the operating system and the memory already allocated by the process in other modules or libraries.

EZMap16.SetZValue

Sets Z value (in metric coordinate) at pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetZValue(
 float value,
 int x,
 int y
 )
```

Parameters

value

Value of the pixel in metric space.

x

X Coordinate.

y

Y Coordinate.

EZMap16.Type

Pixel accessor type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EImageType Type
  { get; }
```

EZMap16.UndefinedValue

Returns the Undefined value. That value is used to set to mark pixels with no valid depth value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth16 UndefinedValue
  { get; }
```

EZMap16.Width

Access ZMap Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Width
  { get; set; }
```

EZMap16.WorldShape

Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap16 in real space coordinates (e.g mm).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EWorldShape WorldShape
  { get; }
```

EZMap16.WorldToImage

Transforms a 3D world position to a floating point (sub)pixel image position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The Z value is given in grey scale value.
Returns true if the pixel position is inside the image limits and the Z value is positive.
The parameter pixelPt is filled even if the point is outside the image.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool WorldToImage(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint pixelPt
 )
```

Parameters

worldPt

Position in the 3D world space.

pixelPt

Position in the image space.

EZMap16.WorldToMapMatrix

Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap16 space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
override Euresys.Open_eVision.Easy3D.E3DTransformMatrix WorldToMapMatrix
  { get; set; }
```

EZMap16.WorldToZMap

Transforms a 3D world position to a 3D EZMap16 position.
The ZMap space origin is at the lower left corner of the image.
The scales of the world space and ZMap space are the same.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void WorldToZMap(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint zmapPt
 )
```

Parameters

worldPt

Position in the 3D world space.

zmapPt

Position in the ZMap space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap16.XResolution

Resolution of the EZMap16 along the X axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float XResolution
  { get; set; }
```

EZMap16.YResolution

Resolution of the EZMap16 along the Y axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float YResolution
  { get; set; }
```

EZMap16.ZMapToImage

Converts a 2D coordinate in the EZMap16 space to image (sub)pixel space.
(x,y) is the ZMap position (which has the same scale as the world space).
(u,v) is the corresponding pixel position (with its origin in the upper left corner of the image).
All values are expressed in floating point numbers.
Returns true if the pixel position is inside the image limits.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ZMapToImage(
 float x,
 float y,
 ref float u,
 ref float v
 )
```

Parameters

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

u

Column of the pixel as a floating point value.

v

Row of the pixel as a floating point value.

EZMap16.ZMapToWorld

Transforms a 3D EZMap16 position to a 3D world space position.
The ZMap space origin is at the lower left corner of the image.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ZMapToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint zmapPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

zmapPt

Position in the ZMap space.

worldPt

Position in the 3D world space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap16.ZResolution

Resolution of the EZMap16 along the Z axis
The resolution is the number of metric units per grey value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float ZResolution
  { get; set; }
```

4.260. EZMap32f Class

A ZMap32f is a 32bits corrected 2.5D image.
ZMap pixel values (32 bits floating point numbers) represent distances from a 3D reference plane.
Distances are positive, during the ZMap generation all points below the reference plane are discarded.
The EZMap class also stores the transformation from the pixel coordinates to the real world coordinate system.
There could be undefined pixels in the ZMap.

Base Class:EZMap

Namespace: Euresys.Open_eVision.Easy3D

Properties

Height	Access ZMap Height.
MapToWorldMatrix	E3DTransformMatrix that transforms positions from the EZMap32f space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.
RowPitch	Returns the buffer row pitch.
Type	Pixel accessor type.
UndefinedValue	Returns the Undefined value. That value is used to set to mark pixels with no valid depth value.
Width	Access ZMap Width.
WorldShape	Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap32f in real space coordinates (e.g mm).
WorldToMapMatrix	Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap32f space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.
XResolution	Resolution of the EZMap32f along the X axis The resolution is the number of metric units per pixel.
YResolution	Resolution of the EZMap32f along the Y axis The resolution is the number of metric units per pixel.

ZResolution	Resolution of the EZMap32f along the Z axis The resolution is the number of metric units per grey value.

Methods

AddMetadata	Adds a metadata key (name) and value. If the metadata key already exists, its value will be overwritten.
AsEImage	Returns the EZMap32f as an EImageBW32 (32 bits gray scale) to use with existing eVision 2D tools.
Clear	Clears the ZMap: replaces all pixels with the undefined value.
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Buffer coordinates
ConvertCoordinatesPixelToMap	Converts Buffer coordinates to 3D Map coordinates
CopyMetadataTo	Copies all metadata.
DeleteMetadata	Deletes value of this existing metadata key . Throws an exception if it does not exist.
Draw	Draws an EZMap32f in a device context.
DrawImage	Displays the internal image buffer
EZMap32f	Creates a 32 bits EZMap.
FillUndefinedPixels	Fills undefined pixels, used to fill the "holes" in the ZMap.
FillUndefinedPixelsWithMedian	Fills undefined pixels, used to fill the "holes" in the ZMap using a median rectangular kernel of odd size.
GetBufferPtr	Retrieves the pointer to the internal pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer to the pixel buffer.
GetMetadata	Returns the string value of the given metadata. Throws an exception if it does not exist.
GetPixel	Gets the value of a pixel .
GetPixelPositionFromWorldPosition	Returns in the u, v and value parameters the EZMap32f values corresponding to a 3D world position. The world position is projected on the ZMap reference plane to get a position in the ZMap. If the projected position is outside the ZMap, the method returns false.
GetResolution	Gets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.
GetSizeInWorld	Returns the dimensions of the EZMap32f in real world space (e.g metric unit).

GetWorldPositionFromMapPosition	Returns the 3D world position corresponding to a EZMap32f 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap32f, otherwise an exception will be thrown.
GetWorldPositionFromPixelPosition	Returns the 3D world position corresponding to a EZMap32f pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.
GetZMapPositionFromPixelPosition	Returns the corresponding EZMap32f 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.
GetZRange	Compute the minimum and maximum pixel values, excluding the undefined pixels.
GetZValue	Gets Z value (in metric coordinate) at pixel coordinates.
ImageToWorld	Transforms a floating point (sub)pixel image position to a 3D world position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The pixel Z value is in grey scale values (its range depends on the ZMap type).
ImageToZMap	Converts a 2D image (sub)pixel coordinate to the EZMap32f space. (u,v) is the pixel position (with its origin in the upper left corner of the image). (x,y) is the corresponding ZMap position (which has the same scale as the world space). All values are expressed in floating point numbers.
IsVoid	Tests if the EZMap32f object size is zero.
Load	Restores the EZMap32f stored in the given Open eVision file.
LoadImage	Restores the EZMap32f image stored in the given image file.
LoadImageAndMetadata	Loads image format and Metadata in JSON format.
LoadMetadata	Loads Metadata in JSON format.
ModifyMetadata	Changes an existing metadata key and value. Throws an exception if it does not exist.
operator=	Assignment operator.
ResetWorldTransformation	Reset the world transformation, Map to World and World to Map matrices become identity matrix.
Save	Saves the EZMap32f object to the given Open eVision file.
SaveImage	Saves the EZMap32f image to the given image file.

SaveImageAndMetadata	Saves image format and Metadata JSON format.
SaveMetadata	Saves Metadata in JSON format.
SetBufferPtr	Sets the pointer to an externally allocated image buffer.
SetPixel	Sets the value of a pixel .
SetResolution	Sets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.
SetSize	Sets the width and height of the EZMap32f.
SetZValue	Sets Z value (in metric coordinate) at pixel coordinates.
WorldToImage	Transforms a 3D world position to a floating point (sub)pixel image position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The Z value is given in grey scale value. Returns true if the pixel position is inside the image limits and the Z value is positive. The parameter pixelPt is filled even if the point is outside the image.
WorldToZMap	Transforms a 3D world position to a 3D EZMap32f position. The ZMap space origin is at the lower left corner of the image. The scales of the world space and ZMap space are the same.
ZMapToImage	Converts a 2D coordinate in the EZMap32f space to image (sub)pixel space. (x,y) is the ZMap position (which has the same scale as the world space). (u,v) is the corresponding pixel position (with its origin in the upper left corner of the image). All values are expressed in floating point numbers. Returns true if the pixel position is inside the image limits.
ZMapToWorld	Transforms a 3D EZMap32f position to a 3D world space position. The ZMap space origin is at the lower left corner of the image.

EZMap32f.AddMetadata

Adds a metadata key (name) and value.
If the metadata key already exists, its value will be overwritten.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EZMap32f.AsEImage

Returns the EZMap32f as an EImageBW32 (32 bits gray scale) to use with existing eVision 2D tools.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EImageBW32f AsEImage(
 )
Euresys.Open_eVision.EImageBW32f AsEImage(
 )
```

EZMap32f.Clear

Clears the ZMap: replaces all pixels with the undefined value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Clear(
 )
```

EZMap32f.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ClearMetadata(
 )
```

EZMap32f.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Buffer coordinates

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D
The Map X coordinate.

y3D
The Map Y coordinate.

xBuffer
The returned Pixel X coordinate.

yBuffer
The returned Pixel Y coordinate.

EZMap32f.ConvertCoordinatesPixelToMap

Converts Buffer coordinates to 3D Map coordinates

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer
The pixel X coordinate.

yBuffer
The pixel Y coordinate.

x3D
The returned Map X coordinate.

y3D
The returned Map Y coordinate.

EZMap32f.CopyMetadataTo

Copies all metadata.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void CopyMetadataTo(
 Euresys.Open_eVision.Easy3D.EZMap32f other
 )
```

Parameters

other

An other EZMap32f.

EZMap32f.DeleteMetadata

Deletes value of this existing metadata key . Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DeleteMetadata(
 string Key
 )
```

Parameters

Key

-

EZMap32f.Draw

Draws an EZMap32f in a device context.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the ZMap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A ZMap can be drawn (its pixels rendered) using a device context. EZMap32f::Draw and EZMap32f::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap32f.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context. EZMap32f::Draw and EZMap32f::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap32f.EZMap32f

Creates a 32 bits EZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EZMap32f(
 )

void EZMap32f(
 int width,
 int height
 )
```

```
void EZMap32f(
 Euresys.Open_eVision.Easy3D.EZMap32f other
 )
```

Parameters

width

The width of the new ZMap.

height

The height of the new ZMap.

other

Another ZMap.

EZMap32f.FillUndefinedPixels

Fills undefined pixels, used to fill the "holes" in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillUndefinedPixels(
 Euresys.Open_eVision.Easy3D.EZMap32f outMap,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

outMap

The destination ZMap.

direction

Direction in which the undefined pixels are filled in a ZMap from EFillUndefinedPixelsDirection.

method

Which values used to fill the undefined pixels in a ZMap from EFillUndefinedPixelsMethod.

EZMap32f.FillUndefinedPixelsWithMedian

Fills undefined pixels, used to fill the "holes" in the ZMap using a median rectangular kernel of odd size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void FillUndefinedPixelsWithMedian(
 Euresys.Open_eVision.Easy3D.EZMap32f outMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

outMap

The destination ZMap.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 2).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth).

EZMap32f.GetBufferPtr

Retrieves the pointer to the internal pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel which we want the address.

y

Row of the pixel which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EZMap32f.GetCheckedBufferPtr

Retrieves the pointer to the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

EZMap32f.GetMetadata

Returns the string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EZMap32f.GetPixel

Gets the value of a pixel .

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth32f GetPixel(
 int x,
 int y
 )
```

Parameters

x
Column of the pixel.

y
Row of the pixel.

EZMap32f.GetPixelPositionFromWorldPosition

Returns in the u, v and value parameters the EZMap32f values corresponding to a 3D world position.
The world position is projected on the ZMap reference plane to get a position in the ZMap.
If the projected position is outside the ZMap, the method returns false.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool GetPixelPositionFromWorldPosition(
 Euresys.Open_eVision.Easy3D.E3DPoint world_position,
 ref int u,
 ref int v,
 ref Euresys.Open_eVision.EDepth32f value
 )
```

Parameters

world_position
The 3D coordinates of a world position.

u
Column of the ZMap pixel in [0,width[.

v
Row of the ZMap pixel in [0,height[.

value
Value of the pixel.

EZMap32f.GetResolution

Gets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel.
For the Z axis it is expressed in metric units per grey scale value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetResolution(
 ref float sx,
 ref float sy,
 ref float sz
 )

Euresys.Open_eVision.Easy3D.E3DPoint GetResolution(
 )
```

Parameters

sx
Resolution along the X axis.

sy
Resolution along the Y axis.

sz
Resolution along the Z axis.

EZMap32f.GetSizeInWorld

Returns the dimensions of the EZMap32f in real world space (e.g metric unit).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetSizeInWorld(
 ref float worldWidth,
 ref float worldHeight
 )
```

Parameters

worldWidth
Contains the size of the ZMap along the X axis (column).

worldHeight
Contains the size of the ZMap along the Y axis (row).

EZMap32f.GetWorldPositionFromMapPosition

Returns the 3D world position corresponding to a EZMap32f 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap32f, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromMapPosition(
 float x,
 float y
 )
```

Parameters

x

The X coordinate.

y

The Y coordinate.

EZMap32f.GetWorldPositionFromPixelPosition

Returns the 3D world position corresponding to a EZMap32f pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap32f.GetZMapPositionFromPixelPosition

Returns the corresponding EZMap32f 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetZMapPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap32f.GetZRange

Compute the minimum and maximum pixel values, excluding the undefined pixels.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetZRange(
 ref Euresys.Open_eVision.EBW32f min,
 ref Euresys.Open_eVision.EBW32f max
 )
```

Parameters

min

The lowest pixel value.

max

The highest pixel value.

EZMap32f.GetZValue

Gets Z value (in metric coordinate) at pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float GetZValue(
 int x,
 int y
 )
```

Parameters

x
X Coordinate.

y
Y Coordinate.

EZMap32f.Height

Access ZMap Height.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Height
  { get; set; }
```

EZMap32f.ImageToWorld

Transforms a floating point (sub)pixel image position to a 3D world position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The pixel Z value is in grey scale values (its range depends on the ZMap type).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ImageToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint pixelPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

pixelPt
Position in the image space.

worldPt
Position in the 3D world space.

EZMap32f.ImageToZMap

Converts a 2D image (sub)pixel coordinate to the EZMap32f space.
(u,v) is the pixel position (with its origin in the upper left corner of the image).
(x,y) is the corresponding ZMap position (which has the same scale as the world space).
All values are expressed in floating point numbers.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ImageToZMap(
 float u,
 float v,
 ref float x,
 ref float y
 )
```

Parameters

u

X Coordinate of the pixel as a floating point value.

v

Y Coordinate of the pixel as a floating point value.

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

EZMap32f.IsVoid

Tests if the EZMap32f object size is zero.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsVoid(
 )
```

Remarks

Returns true if the ZMap size is zero.

EZMap32f.Load

Restores the EZMap32f stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path to the file.

serializer

-

Remarks

When loading, the ZMap is resized if needed. This function restores all the ZMap attributes.

EZMap32f.LoadImage

Restores the EZMap32f image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the ZMap is resized if needed. This function does not restore the ZMap attributes, only the image associated with the EZMap32f is updated.

EZMap32f.LoadImageAndMetadata

Loads image format and Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string path,
 string pathMetadata
 )
```

Parameters

path

-

pathMetadata

Full path to the file.

EZMap32f.LoadMetadata

Loads Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path

Full path to the file.

EZMap32f.MapToWorldMatrix

E3DTransformMatrix that transforms positions from the EZMap32f space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.E3DTransformMatrix MapToWorldMatrix
  { get; set; }
```

EZMap32f.ModifyMetadata

Changes an existing metadata key and value. Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key

-

value

-

EZMap32f.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EZMap32f operator=(
 Euresys.Open_eVision.Easy3D.EZMap32f other
 )
```

Parameters

other

The source EZMap32f.

EZMap32f.ResetWorldTransformation

Reset the world transformation, Map to World and World to Map matrices become identity matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ResetWorldTransformation(
 )
```

EZMap32f.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int RowPitch
  { get; }
```

EZMap32f.Save

Saves the EZMap32f object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This format save the EZMap32f in a Open eVision file. This function stores all the ZMap attributes.

EZMap32f.SaveImage

Saves the EZMap32f image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This format save the image associated to EZMap32f in a standard image file and thus does not store ZMap attributes.

EZMap32f.SaveImageAndMetadata

Saves image format and Metadata JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string path,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

path

-

pathMetadata

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

EZMap32f.SaveMetadata

Saves Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EZMap32f.SetBufferPtr

Sets the pointer to an externally allocated image buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the data.

bitsPerRow

The total number of bits contained in a row, padding included.
Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EZMap32f::SetBufferPtr.

EZMap32f.SetPixel

Sets the value of a pixel .

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetPixel(
 Euresys.Open_eVision.EDepth32f value,
 int x,
 int y
 )
```

Parameters

value
Value of the pixel.

x
Column of the pixel.

y
Row of the pixel.

EZMap32f.SetResolution

Sets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetResolution(
 float rx,
 float ry,
 float rz
 )
void SetResolution(
 Euresys.Open_eVision.Easy3D.E3DPoint resolution
 )
```

Parameters

rx
Resolution along the X axis.

ry
Resolution along the Y axis.

rz
Resolution along the Z axis.

resolution
Resolution for X,Y and Z axis.

EZMap32f.SetSize

Sets the width and height of the EZMap32f.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSize(
 int width,
 int height
 )
```

```
void SetSize(
 Euresys.Open_eVision.Easy3D.EZMap other
 )
```

Parameters

width

The new requested width.

height

The new requested height.

other

The other ZMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new image buffer (deallocate the old image buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new Open eVision image buffer and setting its size creates a 4-byte aligned buffer, by default. The *size of an ZMap* is specified as a number of columns (width) and rows (height).
The maximum image dimensions are 32767 by 32767. Furthermore, it must fit into the available memory, that depends upon the physical memory, the operating system and the memory already allocated by the process in other modules or libraries.

EZMap32f.SetZValue

Sets Z value (in metric coordinate) at pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetZValue(
 float value,
 int x,
 int y
 )
```

Parameters

value

Value of the pixel in metric space.

x

X Coordinate.

y

Y Coordinate.

EZMap32f.Type

Pixel accessor type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EImageType Type
  { get; }
```

EZMap32f.UndefinedValue

Returns the Undefined value. That value is used to set to mark pixels with no valid depth value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth32f UndefinedValue
  { get; }
```

EZMap32f.Width

Access ZMap Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Width
  { get; set; }
```

EZMap32f.WorldShape

Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap32f in real space coordinates (e.g mm).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EWorldShape WorldShape
  { get; }
```

EZMap32f.WorldToImage

Transforms a 3D world position to a floating point (sub)pixel image position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The Z value is given in grey scale value.
Returns true if the pixel position is inside the image limits and the Z value is positive.
The parameter pixelPt is filled even if the point is outside the image.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool WorldToImage(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint pixelPt
 )
```

Parameters

worldPt

Position in the 3D world space.

pixelPt

Position in the image space.

EZMap32f.WorldToMapMatrix

Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap32f space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
override Euresys.Open_eVision.Easy3D.E3DTransformMatrix WorldToMapMatrix
  { get; set; }
```

EZMap32f.WorldToZMap

Transforms a 3D world position to a 3D EZMap32f position.
The ZMap space origin is at the lower left corner of the image.
The scales of the world space and ZMap space are the same.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void WorldToZMap(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint zmapPt
 )
```

Parameters

worldPt

Position in the 3D world space.

zmapPt

Position in the ZMap space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap32f.XResolution

Resolution of the EZMap32f along the X axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float XResolution
  { get; set; }
```

EZMap32f.YResolution

Resolution of the EZMap32f along the Y axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float YResolution
  { get; set; }
```

EZMap32f.ZMapToImage

Converts a 2D coordinate in the EZMap32f space to image (sub)pixel space.
(x,y) is the ZMap position (which has the same scale as the world space).
(u,v) is the corresponding pixel position (with its origin in the upper left corner of the image).
All values are expressed in floating point numbers.
Returns true if the pixel position is inside the image limits.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ZMapToImage(
 float x,
 float y,
 ref float u,
 ref float v
 )
```

Parameters

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

u

Column of the pixel as a floating point value.

v

Row of the pixel as a floating point value.

EZMap32f.ZMapToWorld

Transforms a 3D EZMap32f position to a 3D world space position.
The ZMap space origin is at the lower left corner of the image.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ZMapToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint zmapPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

zmapPt

Position in the ZMap space.

worldPt

Position in the 3D world space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap32f.ZResolution

Resolution of the EZMap32f along the Z axis
The resolution is the number of metric units per grey value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float ZResolution
  { get; set; }
```

4.261. EZMap8 Class

A ZMap8 is a 8bits corrected 2.5D image.
ZMap Pixel values (8 bits integers) represent distances from a 3D reference plane.
Distances are positive, during the ZMap generation all points below the reference plane are discarded.
The EZMap class also stores the transformation from the pixel coordinates to the real world coordinate system.
There could be undefined pixels in the ZMap.

Base Class:EZMap

Namespace: Euresys.Open_eVision.Easy3D

Properties

Height	Access ZMap Height.
MapToWorldMatrix	E3DTransformMatrix that transforms positions from the EZMap8 space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.
RowPitch	Returns the buffer row pitch.
Type	Pixel accessor type.
UndefinedValue	Returns the Undefined value. That value is used to set to mark pixels with no valid depth value.
Width	Access ZMap Width.
WorldShape	Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap8 in real space coordinates (e.g mm).
WorldToMapMatrix	Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap8 space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.
XResolution	Resolution of the EZMap8 along the X axis The resolution is the number of metric units per pixel.
YResolution	Resolution of the EZMap8 along the Y axis The resolution is the number of metric units per pixel.
ZResolution	Resolution of the EZMap8 along the Z axis The resolution is the number of metric units per grey value.

Methods

AddMetadata	Adds a metadata key (name) and value. If the metadata key already exists, its value will be overwritten.
AsEImage	Returns the EZMap8 as an EImageBW8 (8 bits gray scale) to use with existing eVision 2D tools.
Clear	Clears the ZMap: replaces all pixels with the undefined value.
ClearMetadata	Deletes all metadata.
ConvertCoordinatesMapToPixel	Converts 3D Map coordinates to Buffer coordinates
ConvertCoordinatesPixelToMap	Converts Buffer coordinates to 3D Map coordinates
CopyMetadataTo	Copies all metadata.
DeleteMetadata	Deletes value of this existing metadata key . Throws an exception if it does not exist.
Draw	Draws an EZMap8 in a device context.
DrawImage	Displays the internal image buffer
EZMap8	Creates a 8 bits EZMap.
FillUndefinedPixels	Fills undefined pixels, used to fill the "holes" in the ZMap.
FillUndefinedPixelsWithMedian	Fills undefined pixels, used to fill the "holes" in the ZMap using a median rectangular kernel of odd size.
GetBufferPtr	Retrieves the pointer to the internal pixel buffer.
GetCheckedBufferPtr	Retrieves the pointer to the pixel buffer.
GetMetadata	Returns the string value of the given metadata. Throws an exception if it does not exist.
GetPixel	Gets the value of a pixel .
GetPixelPositionFromWorldPosition	Returns in the u, v and value parameters the EZMap8 values corresponding to a 3D world position. The world position is projected on the ZMap reference plane to get a position in the ZMap. If the projected position is outside the ZMap, the method returns false.
GetResolution	Gets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.
GetSizeInWorld	Returns the dimensions of the EZMap8 in real world space (e.g metric unit).
GetWorldPositionFromMapPosition	Returns the 3D world position corresponding to a EZMap8 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap8, otherwise an exception will be thrown.

GetWorldPositionFromPixelPosition	Returns the 3D world position corresponding to a EZMap8 pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.
GetZMapPositionFromPixelPosition	Returns the corresponding EZMap8 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.
GetZRange	Compute the minimum and maximum pixel values, excluding the undefined pixels.
GetZValue	Gets Z value (in metric coordinate) at pixel coordinates.
ImageToWorld	Transforms a floating point (sub)pixel image position to a 3D world position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The pixel Z value is in grey scale values (its range depends on the ZMap type).
ImageToZMap	Converts a 2D image (sub)pixel coordinate to the EZMap8 space. (u,v) is the pixel position (with its origin in the upper left corner of the image). (x,y) is the corresponding ZMap position (which has the same scale as the world space). All values are expressed in floating point numbers.
IsVoid	Tests if the EZMap8 object size is zero.
Load	Restores the EZMap8 stored in the given Open eVision file.
LoadImage	Restores the EZMap8 image stored in the given image file.
LoadImageAndMetadata	Loads image format and Metadata in JSON format.
LoadMetadata	Loads Metadata in JSON format.
ModifyMetadata	Changes an existing metadata key and value. Throws an exception if it does not exist.
operator=	Assignment operator.
ResetWorldTransformation	Reset the world transformation, Map to World and World to Map matrices become identity matrix.
Save	Saves the EZMap8 object to the given Open eVision file.
SaveImage	Saves the EZMap8 image to the given image file.
SaveImageAndMetadata	Saves image format and Metadata JSON format.
SaveMetadata	Saves Metadata in JSON format.
SetBufferPtr	Sets the pointer to an externally allocated image buffer.

SetPixel	Sets the value of a pixel .
SetResolution	Sets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.
SetSize	Sets the width and height of the EZMap8.
SetZValue	Sets Z value (in metric coordinate) at pixel coordinates.
WorldToImage	Transforms a 3D world position to a floating point (sub)pixel image position. The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel. The Z value is given in grey scale value. Returns true if the pixel position is inside the image limits and the Z value is positive. The parameter pixelPt is filled even if the point is outside the image.
WorldToZMap	Transforms a 3D world position to a 3D EZMap8 position. The ZMap space origin is at the lower left corner of the image. The scales of the world space and ZMap space are the same.
ZMapToImage	Converts a 2D coordinate in the EZMap8 space to image (sub)pixel space. (x,y) is the ZMap position (which has the same scale as the world space). (u,v) is the corresponding pixel position (with its origin in the upper left corner of the image). All values are expressed in floating point numbers. Returns true if the pixel position is inside the image limits.
ZMapToWorld	Transforms a 3D EZMap8 position to a 3D world space position. The ZMap space origin is at the lower left corner of the image.

EZMap8.AddMetadata

Adds a metadata key (name) and value.
If the metadata key already exists, its value will be overwritten.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void AddMetadata(
 string Key,
 string value
 )
```

Parameters

Key

The name of the metadata. Names are unique.

value

The value for the given metadata.

EZMap8.AsEImage

Returns the EZMap8 as an EImageBW8 (8 bits gray scale) to use with existing eVision 2D tools.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EImageBW8 AsEImage(
 )
Euresys.Open_eVision.EImageBW8 AsEImage(
 )
```

EZMap8.Clear

Clears the ZMap: replaces all pixels with the undefined value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Clear(
 )
```

EZMap8.ClearMetadata

Deletes all metadata.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ClearMetadata(
 )
```

EZMap8.ConvertCoordinatesMapToPixel

Converts 3D Map coordinates to Buffer coordinates

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ConvertCoordinatesMapToPixel(
 float x3D,
 float y3D,
 ref int xBuffer,
 ref int yBuffer
 )
```

Parameters

x3D
The Map X coordinate.

y3D
The Map Y coordinate.

xBuffer
The returned Pixel X coordinate.

yBuffer
The returned Pixel Y coordinate.

EZMap8.ConvertCoordinatesPixelToMap

Converts Buffer coordinates to 3D Map coordinates

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ConvertCoordinatesPixelToMap(
 int xBuffer,
 int yBuffer,
 ref float x3D,
 ref float y3D
 )
```

Parameters

xBuffer
The pixel X coordinate.

yBuffer
The pixel Y coordinate.

x3D
The returned Map X coordinate.

y3D
The returned Map Y coordinate.

EZMap8.CopyMetadataTo

Copies all metadata.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void CopyMetadataTo(
 Euresys.Open_eVision.Easy3D.EZMap8 other
 )
```

Parameters

other

An other EZMap8.

EZMap8.DeleteMetadata

Deletes value of this existing metadata key . Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void DeleteMetadata(
 string Key
 )
```

Parameters

Key

-

EZMap8.Draw

Draws an EZMap8 in a device context.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )
```

```
void Draw(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY
 )

void Draw(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the ZMap is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

A ZMap can be drawn (its pixels rendered) using a device context. EZMap8::Draw and EZMap8::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap8.DrawImage

Displays the internal image buffer

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

```
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 Euresys.Open_eVision.EDrawAdapter graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EC24Vector c24Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
void DrawImage(
 IntPtr graphicContext,
 Euresys.Open_eVision.EBW8Vector bw8Vector,
 float zoomX,
 float zoomY,
 float panX,
 float panY,
 Euresys.Open_eVision.EC24 colorUndefinedPixel
 )
```

Parameters

graphicContext

Handle to the device context of the destination window.

zoomX

Magnification factor for zooming in or out in the horizontal direction. By default, the image is displayed in 1:1 scale.

zoomY

Magnification factor for zooming in or out in the vertical direction. Setting a 0 value (which is the default) will result in isotropic scaling (i.e. equal horizontal and vertical factors).

panX

Horizontal panning value expressed in pixels. By default, no panning occurs.

panY

Vertical panning value expressed in pixels. By default, no panning occurs.

colorUndefinedPixel

An optional parameter to choose the drawing color of undefined pixels.

c24Vector

When supplied, this parameter allows using a LUT that maps from Depth to C24 when drawing (false colors).

bw8Vector

When supplied, this parameter allows using a LUT that maps from Depth to BW8 when drawing.

Remarks

An image can be drawn (its pixels rendered) using a device context. EZMap8::Draw and EZMap8::DrawImage produce the same output.
The horizontal and vertical zooming factors can be different but must be in the 1/16..16 range.
(MFC users can use the CDC::GetSafeHdc() method to obtain a suitable device context handle from a CDC instance.) Deprecation notice: All methods taking HDC as parameter are deprecated. It is recommended to use their alternative taking a EDrawAdapter by using a instance of EWindowsDrawAdapter.

EZMap8.EZMap8

Creates a 8 bits EZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EZMap8(
 )
void EZMap8(
 int width,
 int height
 )
```

```
void EZMap8(
 Euresys.Open_eVision.Easy3D.EZMap8 other
 )
```

Parameters

width
The width of the new ZMap.

height
The height of the new ZMap.

other
Another ZMap.

EZMap8.FillUndefinedPixels

Fills undefined pixels, used to fill the "holes" in the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void FillUndefinedPixels(
 Euresys.Open_eVision.Easy3D.EZMap8 outMap,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsDirection direction,
 Euresys.Open_eVision.Easy3D.EFillUndefinedPixelsMethod method
 )
```

Parameters

outMap
The destination ZMap.

direction
Direction in which the undefined pixels are filled in a ZMap from EFillUndefinedPixelsDirection.

method
Which values used to fill the undefined pixels in a ZMap from EFillUndefinedPixelsMethod.

EZMap8.FillUndefinedPixelsWithMedian

Fills undefined pixels, used to fill the "holes" in the ZMap using a median rectangular kernel of odd size.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void FillUndefinedPixelsWithMedian(
 Euresys.Open_eVision.Easy3D.EZMap8 outMap,
 uint halfOfKernelWidth,
 uint halfOfKernelHeight
 )
```

Parameters

outMap

The destination ZMap.

halfOfKernelWidth

Half of the box width minus one (by default, halfOfKernelWidth = 2).

halfOfKernelHeight

Half of the box height minus one (by default, same as halfOfKernelWidth).

EZMap8.GetBufferPtr

Retrieves the pointer to the internal pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
IntPtr GetBufferPtr(
 )
IntPtr GetBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel which we want the address.

y

Row of the pixel which we want the address.

Remarks

This function does not check the value of the parameters.
Use carefully.

EZMap8.GetCheckedBufferPtr

Retrieves the pointer to the pixel buffer.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
IntPtr GetCheckedBufferPtr(
 int x,
 int y
 )
```

Parameters

x

Column of the pixel of which we want the address.

y

Row of the pixel of which we want the address.

EZMap8.GetMetadata

Returns the string value of the given metadata.
Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string GetMetadata(
 string Key
 )
```

Parameters

Key

The name of an existing metadata.

EZMap8.GetPixel

Gets the value of a pixel .

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth8 GetPixel(
 int x,
 int y
 )
```

Parameters

x
Column of the pixel.

y
Row of the pixel.

EZMap8.GetPixelPositionFromWorldPosition

Returns in the u, v and value parameters the EZMap8 values corresponding to a 3D world position.
The world position is projected on the ZMap reference plane to get a position in the ZMap.
If the projected position is outside the ZMap, the method returns false.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool GetPixelPositionFromWorldPosition(
 Euresys.Open_eVision.Easy3D.E3DPoint world_position,
 ref int u,
 ref int v,
 ref Euresys.Open_eVision.EDepth8 value
 )
```

Parameters

world_position
The 3D coordinates of a world position.

u
Column of the ZMap pixel in [0,width[.

v
Row of the ZMap pixel in [0,height[.

value
Value of the pixel.

EZMap8.GetResolution

Gets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel.
For the Z axis it is expressed in metric units per grey scale value.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetResolution(
 ref float sx,
 ref float sy,
 ref float sz
 )

Euresys.Open_eVision.Easy3D.E3DPoint GetResolution(
 )
```

Parameters

sx
Resolution along the X axis.

sy
Resolution along the Y axis.

sz
Resolution along the Z axis.

EZMap8.GetSizeInWorld

Returns the dimensions of the EZMap8 in real world space (e.g metric unit).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void GetSizeInWorld(
 ref float worldWidth,
 ref float worldHeight
 )
```

Parameters

worldWidth
Contains the size of the ZMap along the X axis (column).

worldHeight
Contains the size of the ZMap along the Y axis (row).

EZMap8.GetWorldPositionFromMapPosition

Returns the 3D world position corresponding to a EZMap8 2D coordinate. The world position is in the original point cloud space. (x,y) is the ZMap position (which has the same scale as the world space). The value at position (x, y) must not be undefined in the EZMap8, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromMapPosition(
 float x,
 float y
 )
```

Parameters

x

The X coordinate.

y

The Y coordinate.

EZMap8.GetWorldPositionFromPixelPosition

Returns the 3D world position corresponding to a EZMap8 pixel position. The world position is in the original point cloud space. The pixel space origin is at the upper left corner of the image and ranges to (width-1, height-1). The transformation to the world position is calculated using the center of the pixel. The pixel value at position (u,v) must not be undefined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetWorldPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap8.GetZMapPositionFromPixelPosition

Returns the corresponding EZMap8 3D position of a ZMap pixel. The ZMap position is in the original point ZMap space. The pixel position origin is the upper left corner of the image and ranges to (width-1, height-1). The center of the pixel is used for the transformation to the ZMap position. Pixel at position (u,v) must be defined, otherwise an exception will be thrown.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint GetZMapPositionFromPixelPosition(
 int u,
 int v
 )
```

Parameters

u

Column of the pixel (bounds: [0,width[).

v

Row of the pixel (bounds: [0,height[).

EZMap8.GetZRange

Compute the minimum and maximum pixel values, excluding the undefined pixels.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void GetZRange(
 ref Euresys.Open_eVision.EBW8 min,
 ref Euresys.Open_eVision.EBW8 max
 )
```

Parameters

min

The lowest pixel value.

max

The highest pixel value.

EZMap8.GetZValue

Gets Z value (in metric coordinate) at pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float GetZValue(
 int x,
 int y
 )
```

Parameters

x
X Coordinate.

y
Y Coordinate.

EZMap8.Height

Access ZMap Height.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Height
  { get; set; }
```

EZMap8.ImageToWorld

Transforms a floating point (sub)pixel image position to a 3D world position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The pixel Z value is in grey scale values (its range depends on the ZMap type).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ImageToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint pixelPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

pixelPt
Position in the image space.

worldPt
Position in the 3D world space.

EZMap8.ImageToZMap

Converts a 2D image (sub)pixel coordinate to the EZMap8 space.
(u,v) is the pixel position (with its origin in the upper left corner of the image).
(x,y) is the corresponding ZMap position (which has the same scale as the world space).
All values are expressed in floating point numbers.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void ImageToZMap(
 float u,
 float v,
 ref float x,
 ref float y
 )
```

Parameters

u

X Coordinate of the pixel as a floating point value.

v

Y Coordinate of the pixel as a floating point value.

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

EZMap8.IsVoid

Tests if the EZMap8 object size is zero.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool IsVoid(
 )
```

Remarks

Returns true if the ZMap size is zero.

EZMap8.Load

Restores the EZMap8 stored in the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

Full path to the file.

serializer

-

Remarks

When loading, the ZMap is resized if needed. This function restores all the ZMap attributes.

EZMap8.LoadImage

Restores the EZMap8 image stored in the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImage(
 string path,
 bool withMetadata
 )
```

Parameters

path

Full path to the file.

withMetadata

Parameter to load or not the metadata that has the same filename. False by default.

Remarks

When loading, the ZMap is resized if needed. This function does not restore the ZMap attributes, only the image associated with the EZMap8 is updated.

EZMap8.LoadImageAndMetadata

Loads image format and Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadImageAndMetadata(
 string pathImage,
 string pathMetadata
 )
```

Parameters

pathImage

Full path to the file.

pathMetadata

Full path to the file.

EZMap8.LoadMetadata

Loads Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void LoadMetadata(
 string path
 )
```

Parameters

path

Full path to the file.

EZMap8.MapToWorldMatrix

E3DTransformMatrix that transforms positions from the EZMap8 space to the world space. This transformation is composed of rotation and translation only, so it is a rigid transformation and preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.Easy3D.E3DTransformMatrix MapToWorldMatrix
  { get; set; }
```

EZMap8.ModifyMetadata

Changes an existing metadata key and value. Throws an exception if it does not exist.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ModifyMetadata(
 string Key,
 string value
 )
```

Parameters

Key

-

value

-

EZMap8.operator=

Assignment operator.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.EZMap8 operator=(
 Euresys.Open_eVision.Easy3D.EZMap8 other
 )
```

Parameters

other

The source EZMap8.

EZMap8.ResetWorldTransformation

Reset the world transformation, Map to World and World to Map matrices become identity matrix.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ResetWorldTransformation(
 )
```

EZMap8.RowPitch

Returns the buffer row pitch.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int RowPitch
  { get; }
```

EZMap8.Save

Saves the EZMap8 object to the given Open eVision file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The full path to the destination file.

serializer

-

Remarks

This format save the EZMap8 in a Open eVision file. This function stores all the ZMap attributes.

EZMap8.SaveImage

Saves the EZMap8 image to the given image file.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImage(
 string path,
 Euresys.Open_eVision.EImageFileType type,
 bool withMetadata
 )
```

Parameters

path

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

withMetadata

Parameter to save or not the metadata that with the same filename next. False by default.

Remarks

This format save the image associated to EZMap8 in a standard image file and thus does not store ZMap attributes.

EZMap8.SaveImageAndMetadata

Saves image format and Metadata JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveImageAndMetadata(
 string pathImage,
 string pathMetadata,
 Euresys.Open_eVision.EImageFileType type
 )
```

Parameters

pathImage

The full path to the destination file.

pathMetadata

The full path to the destination file.

type

File format, as defined by EImageFileType. If not specified, the file format is determined from the file extension.

EZMap8.SaveMetadata

Saves Metadata in JSON format.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SaveMetadata(
 string path
 )
```

Parameters

path

The full path to the destination file.

EZMap8.SetBufferPtr

Sets the pointer to an externally allocated image buffer.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetBufferPtr(
 int width,
 int height,
 IntPtr imagePointer,
 int bitsPerRow
 )
```

Parameters

width

The width of the supplied buffer, in pixels.

height

The height of the supplied buffer, in pixels.

imagePointer

The pointer (aligned on 4 bytes) to the buffer, which must be large enough to hold the data.

bitsPerRow

The total number of bits contained in a row, padding included.
Using the value 0 (default) means that this size is computed from the buffer width and the pixel size plus a padding with the smallest possible value that leads to a multiple of 4 bytes (32 bits), which is the minimum padding accepted by EZMap8::SetBufferPtr.

EZMap8.SetPixel

Sets the value of a pixel .

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetPixel(
 Euresys.Open_eVision.EDepth8 value,
 int x,
 int y
 )
```

Parameters

value
Value of the pixel.

x
Column of the pixel.

y
Row of the pixel.

EZMap8.SetResolution

Sets the resolution. For the X and Y axes, the resolution is expressed in metric units per pixel. For the Z axis it is expressed in metric units per grey scale value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetResolution(
 float rx,
 float ry,
 float rz
 )
void SetResolution(
 Euresys.Open_eVision.Easy3D.E3DPoint resolution
 )
```

Parameters

rx
Resolution along the X axis.

ry
Resolution along the Y axis.

rz
Resolution along the Z axis.

resolution
Resolution for X,Y and Z axis.

EZMap8.SetSize

Sets the width and height of the EZMap8.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void SetSize(
 int width,
 int height
 )
```

```
void SetSize(
 Euresys.Open_eVision.Easy3D.EZMap other
 )
```

Parameters

width

The new requested width.

height

The new requested height.

other

The other ZMap whose dimensions have to be used for the current object.

Remarks

Open eVision will allocate a new image buffer (deallocate the old image buffer) if the supplied width and height are different from the existing ones.
If an external buffer has been specified by means of SetImagePtr, it will be kept only if the size does not change.
Creating a new Open eVision image buffer and setting its size creates a 4-byte aligned buffer, by default. The *size of an ZMap* is specified as a number of columns (width) and rows (height).
The maximum image dimensions are 32767 by 32767. Furthermore, it must fit into the available memory, that depends upon the physical memory, the operating system and the memory already allocated by the process in other modules or libraries.

EZMap8.SetZValue

Sets Z value (in metric coordinate) at pixel coordinates.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void SetZValue(
 float value,
 int x,
 int y
 )
```

Parameters

value

Value of the pixel in metric space.

x

X Coordinate.

y

Y Coordinate.

EZMap8.Type

Pixel accessor type.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EImageType Type
  { get; }
```

EZMap8.UndefinedValue

Returns the Undefined value. That value is used to set to mark pixels with no valid depth value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EDepth8 UndefinedValue
  { get; }
```

EZMap8.Width

Access ZMap Width.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override int Width
  { get; set; }
```

EZMap8.WorldShape

Returns the EWorldShape for conversion between 2D image and 2D world space coordinates. This EWorldShape can be used by EasyGauge to do measurements on a EZMap8 in real space coordinates (e.g mm).

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override Euresys.Open_eVision.EWorldShape WorldShape
  { get; }
```

EZMap8.WorldToImage

Transforms a 3D world position to a floating point (sub)pixel image position.
The image space origin is at the upper left corner of the image and the X/Y unit size is one pixel.
The Z value is given in grey scale value.
Returns true if the pixel position is inside the image limits and the Z value is positive.
The parameter pixelPt is filled even if the point is outside the image.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool WorldToImage(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint pixelPt
 )
```

Parameters

worldPt

Position in the 3D world space.

pixelPt

Position in the image space.

EZMap8.WorldToMapMatrix

Sets/Gets the E3DTransformMatrix that transforms positions from the world space to the EZMap8 space. This transformation is composed of rotation and translation only, so it is a rigid transformation and it preserves distances.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
override Euresys.Open_eVision.Easy3D.E3DTransformMatrix WorldToMapMatrix
  { get; set; }
```

EZMap8.WorldToZMap

Transforms a 3D world position to a 3D EZMap8 position.
The ZMap space origin is at the lower left corner of the image.
The scales of the world space and ZMap space are the same.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void WorldToZMap(
 Euresys.Open_eVision.Easy3D.E3DPoint worldPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint zmapPt
 )
```

Parameters

worldPt

Position in the 3D world space.

zmapPt

Position in the ZMap space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap8.XResolution

Resolution of the EZMap8 along the X axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float XResolution
  { get; set; }
```

EZMap8.YResolution

Resolution of the EZMap8 along the Y axis
The resolution is the number of metric units per pixel.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float YResolution
  { get; set; }
```

EZMap8.ZMapToImage

Converts a 2D coordinate in the EZMap8 space to image (sub)pixel space.
(x,y) is the ZMap position (which has the same scale as the world space).
(u,v) is the corresponding pixel position (with its origin in the upper left corner of the image).
All values are expressed in floating point numbers.
Returns true if the pixel position is inside the image limits.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool ZMapToImage(
 float x,
 float y,
 ref float u,
 ref float v
 )
```

Parameters

x

Position along horizontal axis in the ZMap space.

y

Position along vertical axis in the ZMap space.

u

Column of the pixel as a floating point value.

v

Row of the pixel as a floating point value.

EZMap8.ZMapToWorld

Transforms a 3D EZMap8 position to a 3D world space position.
The ZMap space origin is at the lower left corner of the image.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ZMapToWorld(
 Euresys.Open_eVision.Easy3D.E3DPoint zmapPt,
 ref Euresys.Open_eVision.Easy3D.E3DPoint worldPt
 )
```

Parameters

zmapPt

Position in the ZMap space.

worldPt

Position in the 3D world space.

Remarks

Do not use this method with the same variable as input and output. It might lead to incorrect results.

EZMap8.ZResolution

Resolution of the EZMap8 along the Z axis
The resolution is the number of metric units per grey value.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
override float ZResolution
  { get; set; }
```

4.262. EZMapToMeshConverter Class

Performs the conversion from an EZMap to an EMesh.

Namespace: Euresys.Open_eVision.Easy3D

Properties

MaxEdgeLength	Sets/Gets the maximal length of the longest edge of a triangle of the mesh. Larger triangles will be filtered out. A value of 0 does not perform any filtering. Set to 0 by default.

Methods

Convert	The method 'Convert' performs the conversion from an EZMap to an EMesh.
EZMapToMeshConverter	Creates an EZMapToMeshConverter object.
Load	Loads the converter configuration. The given ESerializer must have been created for reading.
operator=	Assignment operator
Save	Saves the converter configuration. The given ESerializer must have been created for writing.

EZMapToMeshConverter.Convert

The method 'Convert' performs the conversion from an EZMap to an EMesh.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap8 srcZMap,
 Euresys.Open_eVision.Easy3D.EMesh mesh
 )
```

```
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap16 srcZMap,
 Euresys.Open_eVision.Easy3D.EMesh mesh
 )
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap32f srcZMap,
 Euresys.Open_eVision.Easy3D.EMesh mesh
 )
```

Parameters

srcZMap

The ZMap to convert.

mesh

The destination mesh.

EZMapToMeshConverter.EZMapToMeshConverter

Creates an EZMapToMeshConverter object.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void EZMapToMeshConverter(
 )
void EZMapToMeshConverter(
 Euresys.Open_eVision.Easy3D.EZMapToMeshConverter other
 )
```

Parameters

other

Reference to the EZMapToMeshConverter object used for the initialization.

EZMapToMeshConverter.Load

Loads the converter configuration. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EZMapToMeshConverter.MaxEdgeLength

Sets/Gets the maximal length of the longest edge of a triangle of the mesh. Larger triangles will be filtered out. A value of 0 does not perform any filtering. Set to 0 by default.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float MaxEdgeLength
  { get; set; }
```

EZMapToMeshConverter.operator=

Assignment operator

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.EZMapToMeshConverter operator=(
 Euresys.Open_eVision.Easy3D.EZMapToMeshConverter other
 )
```

Parameters

other
Reference to the EZMapToMeshConverter object used for the assignment.

EZMapToMeshConverter.Save

Saves the converter configuration. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

Pointer to the ESerializer created for writing.

4.263. EZMapToPointCloudConverter Class

Generates an EPointCloud from a ZMap.

Namespace: Euresys.Open_eVision.Easy3D

Methods

Convert	Generates an EPointCloud from a ZMap (EZMap8, EZMap16 or EZMap32f). ZMap pixel positions/values (U,V,W) are converted to 3D positions (X,Y,Z) and written to the given point cloud. By default, the target coordinate system is the original world space. Optional parameter inZMapSpace can switch to the ZMap space as the target coordinate system. Normals may be generated from the ZMap and set as an attribute of the EPointCloud.
EZMapToPointCloudConverter	Creates an EZMapToPointCloudConverter object.

EZMapToPointCloudConverter.Convert

Generates an EPointCloud from a ZMap (EZMap8, EZMap16 or EZMap32f). ZMap pixel positions/values (U,V,W) are converted to 3D positions (X,Y,Z) and written to the given point cloud. By default, the target coordinate system is the original world space. Optional parameter inZMapSpace can switch to the ZMap space as the target coordinate system. Normals may be generated from the ZMap and set as an attribute of the EPointCloud.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap8 srcZMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )
```

```
void Convert(
 Euresys.Open_eVision.Easy3D.EZMap8 srcZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap16 srcZMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap16 srcZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap32f srcZMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap32f srcZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap srcZMap,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )

void Convert(
 Euresys.Open_eVision.Easy3D.EZMap srcZMap,
 Euresys.Open_eVision.ERegion region,
 Euresys.Open_eVision.Easy3D.EPointCloud pointCloud,
 bool inZMapSpace,
 bool computeNormals
 )
```

Parameters

srcZMap
The ZMap to convert.
pointCloud
The destination point cloud.
inZMapSpace
When true, converts to 3D ZMap space instead of world space (default is false).
computeNormals
When true, computes normals and put them in the EPointCloud (default is false).
region
The region of interest (default is no region).

Remarks

The destination point cloud will be cleared before being (re-)populated.

EZMapToPointCloudConverter.EZMapToPointCloudConverter

Creates an EZMapToPointCloudConverter object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void EZMapToPointCloudConverter(
 )
```

4.264. TextLabel Class

A class representing a text label that can be displayed using E3DViewer.

Namespace: Euresys.Open_eVision.Easy3D

Properties

Alignment	The alignment of the label.
Anchor	The E3DPoint linked to the text label.
BackgroundColor	The background of the label is set to this color.
Color	The color of the text label.
DisplayAnchor	If set to true, a line is drawn between the anchor and the label.
Fixed	If set to true, the label stays fixed when the view changes.
PosX	The x coordinate of the text box. Value between -1 (left) and 1 (right).
PosY	The y coordinate of the text box. Value between -1 (bottom) and 1 (top).

PoxX	-
PoxY	-
Size	The size of the text font. Value between 0 et 1.
Text	The text of the text label.

Methods

operator=	-
TextLabel	Constructs a text label.

TextLabel.Alignment

The alignment of the label.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.ETextLabelAlignment Alignment
  { get; set; }
```

TextLabel.Anchor

The E3DPoint linked to the text label.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.Easy3D.E3DPoint Anchor
  { get; set; }
```

TextLabel.BackgroundColor

The background of the label is set to this color.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EC24A BackgroundColor
  { get; set; }
```

TextLabel.Color

The color of the text label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.EC24 Color
  { get; set; }
```

TextLabel.DisplayAnchor

If set to true, a line is drawn between the anchor and the label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool DisplayAnchor
  { get; set; }
```

TextLabel.Fixed

If set to true, the label stays fixed when the view changes.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
bool Fixed
  { get; set; }
```

TextLabel.operator=

-

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
Euresys.Open_eVision.Easy3D.TextLabel operator=(
 Euresys.Open_eVision.Easy3D.TextLabel other
 )
```

Parameters

other

-

TextLabel.PosX

The x coordinate of the text box. Value between -1 (left) and 1 (right).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float PosX
  { get; }
```

TextLabel.PosY

The y coordinate of the text box. Value between -1 (bottom) and 1 (top).

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float PosY
  { get; }
```

TextLabel.PoxX

-

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float PoxX
  { get; set; }
```

TextLabel.PoxY

-

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float PoxY
  { get; set; }
```

TextLabel.Size

The size of the text font. Value between 0 et 1.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Size
  { get; set; }
```

TextLabel.Text

The text of the text label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
string Text
  { get; set; }
```

TextLabel.TextLabel

Constructs a text label.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
void TextLabel(
 Euresys.Open_eVision.Easy3D.E3DPoint anchor,
 float posX,
 float posY,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 bool displayAnchor,
 Euresys.Open_eVision.EC24A backgroundColor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
void TextLabel(
 Euresys.Open_eVision.Easy3D.E3DPoint anchor,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 bool fixLabelPosition,
 bool displayAnchor,
 Euresys.Open_eVision.EC24A backgroundColor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
```

```
void TextLabel(
 float posX,
 float posY,
 Euresys.Open_eVision.EC24 color,
 float size,
 string text,
 Euresys.Open_eVision.EC24A backgroundColor,
 Euresys.Open_eVision.Easy3D.ETextLabelAlignment alignment
 )
void TextLabel(
 Euresys.Open_eVision.Easy3D.TextLabel other
 )
```

Parameters

anchor
The E3DPoint linked to the text label.

posX
The x coordinate of the text box. Value between -1 (left) and 1 (right).

posY
The y coordinate of the text box. Value between -1 (bottom) and 1 (top).

color
The color of the text label.

size
The size of the text font. Value between 0 et 1.

text
The text of the text label.

displayAnchor
If set to true, a line is drawn between the anchor and the label (default: true).

backgroundColor
If specified, the background of the label is set to this color (default: black).

alignment
-

fixLabelPosition
If set to true, the label stays fixed when the view changes (default: false).

other
-

5. Structures

5.1. E3DPoint Struct

Represents a 3D point with floating point coordinates.

Namespace: Euresys.Open_eVision.Easy3D

Properties

X	X coordinate of the point.
Y	Y coordinate of the point.
Z	Z coordinate of the point.

Methods

DistanceTo	Returns the euclidean distance to another E3DPoint.
DistanceToSegment	Returns the euclidean distance between the E3DPoint and a segment represented by 2 other E3DPoint.
E3DPoint	Constructs a default E3DPoint object.
Load	Loads the E3DPoint.
operator!=	Checks if two E3DPoint are strictly different.
operator==	Checks if two E3DPoint are strictly equal.
Save	Saves the E3DPoint.
SquareDistanceTo	Returns the euclidean squared distance to another E3DPoint.

E3DPoint.DistanceTo

Returns the euclidean distance to another E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float DistanceTo(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The other point.

E3DPoint.DistanceToSegment

Returns the euclidean distance between the E3DPoint and a segment represented by 2 other E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float DistanceToSegment(
 Euresys.Open_eVision.Easy3D.E3DPoint from,
 Euresys.Open_eVision.Easy3D.E3DPoint to
 )
```

Parameters

from

One end point of the segment

to

The other end point of the segment

E3DPoint.E3DPoint

Constructs a default E3DPoint object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void E3DPoint(
 )

void E3DPoint(
 float x,
 float y,
 float z
 )
```

Parameters

x

X coordinate of the point.

y

Y coordinate of the point.

z

Z coordinate of the point.

Remarks

If the default constructor is used, the point is initialized to (0, 0, 0).

E3DPoint.Load

Loads the E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Load(
 string fileName
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

fileName

-

serializer

Serializer. Must be in read mode.

E3DPoint.operator!=

Checks if two E3DPoint are strictly different.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator!=(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The other point.

E3DPoint.operator==

Checks if two E3DPoint are strictly equal.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool operator==(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The other point.

E3DPoint.Save

Saves the E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void Save(
 string fileName
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

fileName

-

serializer

Serializer. Must be in write mode.

E3DPoint.SquareDistanceTo

Returns the euclidean squared distance to another E3DPoint.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float SquareDistanceTo(
 Euresys.Open_eVision.Easy3D.E3DPoint point
 )
```

Parameters

point

The other point.

E3DPoint.X

X coordinate of the point.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
float X
```

E3DPoint.Y

Y coordinate of the point.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Y
```

E3DPoint.Z

Z coordinate of the point.

Namespace: Euresys.Open_eVision.Easy3D

[C#]

```
float Z
```

5.2. EBarCodeGradingParameters Struct

Represents the grading Parameters associated with an EBarCode as defined by ISO15416.

Remarks

Each grade is expressed as an integer between 0 and 40 instead of a float from 0.0 to 4.0 by steps of 0.1 to avoid rounding errors. Each grade represents the average grade obtained on 10 horizontal lines in the barcode.

Namespace: Euresys.Open_eVision.EasyBarCode2

Properties

AdditionalRequirementName	ISO15416 defines an additional requirement that is symbology specific. This function returns its name for the current EBarCodeGradingParameters. Currently, "Quiet Zone" is always returned.
AdditionalRequirementsGrade	Indicates a symbology specific requirement. The name of that specific requirement for the current EBarCodeGradingParameters may be retrieved with EBarCodeGradingParameters::AdditionalRequirementName. Code128, Gs1_128 and Ean13 all grade the size of the quiet zone of the barcode. Grade is 40 (large enough quiet zone) and 0 (quiet zone too small).
DecodabilityGrade	Indicates the importance of differences between the distances measured and expected. Grade is between 40 (distances measured are close to those expected) and 0 (distances measured are far from those expected).

DecodeGrade	Indicates whether the barcode was decoded. Grade is 40 if barcode was decoded and 0 if it was not.
DefectsGrade	Indicates the importance of irregularities found within elements and quiet zones. Grade is between 40 (small irregularities) and 0 (large irregularities).
GlobalGrade	The global grade is the smallest of all of the other grades. If two scan lines yield different decoded strings, the Global Grade is set to 0. Grade is between 40 (best) and 0 (worst).
MinimumEdgeContrastGrade	Indicates the smallest contrast between two adjacent bar and space (including quiet zones). Grade is 40 if the minimum edge contrast is >= 15% and 0 otherwise.
MinimumReflectanceGrade	Indicates the ratio between the smallest and largest gray value in the barcode. Grade is 40 if the smallest gray value of the barcode is <= half of its highest value and 0 otherwise.
ModulationGrade	Indicates the importance of the minimum edge contrast relative to the symbol contrast. Grade is between 40 (>= 70%) and 0 (< 40%).
SymbolContrastGrade	Indicates the fraction of total image contrast used by the barcode. Grade is between 0 (<= 51 gray values) and 40 (>= 180 gray values).

Methods

ConvertToAlphabeticGrade	ISO15416 defines grades as either number of letters. We use numbers internally but this function can be used to convert number to letters.

EBarCodeGradingParameters.AdditionalRequirementName

ISO15416 defines an additional requirement that is symbology specific. This function returns its name for the current EBarCodeGradingParameters. Currently, "Quiet Zone" is always returned.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
string AdditionalRequirementName
  { get; }
```

EBarCodeGradingParameters.AdditionalRequirementsGrade

Indicates a symbology specific requirement. The name of that specific requirement for the current EBarCodeGradingParameters may be retrieved with EBarCodeGradingParameters::AdditionalRequirementName. Code128, Gs1_128 and Ean13 all grade the size of the quiet zone of the barcode. Grade is 40 (large enough quiet zone) and 0 (quiet zone too small).

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte AdditionalRequirementsGrade
```

EBarCodeGradingParameters.ConvertToAlphabeticGrade

ISO15416 defines grades as either number of letters. We use numbers internally but this function can be used to convert number to letters.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
char ConvertToAlphabeticGrade(
 byte grade
 )
```

Parameters

grade

The grade as an integer between 0 and 40.

EBarCodeGradingParameters.DecodabilityGrade

Indicates the importance of differences between the distances measured and expected. Grade is between 40 (distances measured are close to those expected) and 0 (distances measured are far from those expected).

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte DecodabilityGrade
```

EBarCodeGradingParameters.DecodeGrade

Indicates whether the barcode was decoded. Grade is 40 if barcode was decoded and 0 if it was not.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte DecodeGrade
```

EBarCodeGradingParameters.DefectsGrade

Indicates the importance of irregularities found within elements and quiet zones. Grade is between 40 (small irregularities) and 0 (large irregularities).

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte DefectsGrade
```

EBarCodeGradingParameters.GlobalGrade

The global grade is the smallest of all of the other grades. If two scan lines yield different decoded strings, the Global Grade is set to 0. Grade is between 40 (best) and 0 (worst).

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte GlobalGrade
```

EBarCodeGradingParameters.MinimumEdgeContrastGrade

Indicates the smallest contrast between two adjacent bar and space (including quiet zones). Grade is 40 if the minimum edge contrast is >= 15% and 0 otherwise.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte MinimumEdgeContrastGrade
```

EBarCodeGradingParameters.MinimumReflectanceGrade

Indicates the ratio between the smallest and largest gray value in the barcode. Grade is 40 if the smallest gray value of the barcode is <= half of its highest value and 0 otherwise.

Namespace: Euresys.Open_eVision.EasyBarCode2

[C#]

```
byte MinimumReflectanceGrade
```

EBarCodeGradingParameters.ModulationGrade

Indicates the importance of the minimum edge contrast relative to the symbol contrast. Grade is between 40 (>= 70%) and 0 (< 40%).

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
byte ModulationGrade
```

EBarCodeGradingParameters.SymbolContrastGrade

Indicates the fraction of total image contrast used by the barcode. Grade is between 0 (<= 51 gray values) and 40 (>= 180 gray values).

Namespace: Euresys.Open_eVision.EasyBarCode2

```
[C#]
byte SymbolContrastGrade
```

5.3. EBrush Struct

Brush.

Namespace: Euresys.Open_eVision

Properties

Color	Color of the brush.
Opacity	Opacity of the brush.

Methods

EBrush	Constructs an EBrush.
IsValid	Whether the brush is valid, i.e. when its color is defined.
Load	Loads the EBrush. The given ESerializer must have been created for reading.
operator!=	Inequality operator.
operator==	Equality operator.
Save	Saves the EBrush. The given ESerializer must have been created for writing.
Serialize	Serializes the EBrush.

EBrush.Color

Color of the brush.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.ERGBColor Color
```

EBrush.EBrush

Constructs an EBrush.

Namespace: Euresys.Open_eVision

[C#]

```
void EBrush(
 )
void EBrush(
 Euresys.Open_eVision.ERGBColor color,
 float opacity
 )
```

Parameters

color
Brush color

opacity
Brush opacity

EBrush.IsValid

Whether the brush is valid, i.e. when its color is defined.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsValid(
 )
```

EBrush.Load

Loads the EBrush. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )
```

```
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The serializer.

EBrush.Opacity

Opacity of the brush.

Namespace: Euresys.Open_eVision

[C#]

```
float Opacity
```

EBrush.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EBrush other
 )
```

Parameters

other
Other brush to compare with.

EBrush.operator==

Equality operator.

Namespace: Euresys.Open_eVision

[C#]

```
bool operator==(
 Euresys.Open_eVision.EBrush other
 )
```

Parameters

other

Other brush to compare with.

EBrush.Save

Saves the EBrush. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The ESerializer object that is written to.

EBrush.Serialize

Serializes the EBrush.

Namespace: Euresys.Open_eVision

```
[C#]
void Serialize(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer

Serializer

5.4. EBW1 Struct

Black and white pixel value, coded as an unsigned 32-bit integer.

Remarks

Every pixel is coded on 1 bit, allowing to represent 2 different values. The value 0 stands for black (background), and the value 1 stands for white (foreground).

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The value of the pixel.

Methods

EBW1	Constructs a EBW1 object.

EBW1.EBW1

Constructs a EBW1 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW1(
 )
void EBW1(
 uint value
 )
```

Parameters

value

The value of the pixel.

EBW1.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EBW1.Value

The value of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
uint Value
```

5.5. EBW16 Struct

Gray-level pixel value, coded as an unsigned 16-bit integer.

Remarks

High-quality cameras or scanners are able to digitize on 10 or 12 bits. Sometimes too, to avoid numerical truncation errors, intermediate processing results require more than 8 bits of storage. In such situations, 8 bits gray-level images are no longer sufficient. 16 bits gray-level images are similar to 8 bits ones, but each pixel is, in this case, coded on 16 bits, which effect is to increase the levels of gray to 65,536. It is not possible to show the difference between a gray-level image quantized on 16 bits rather than 8. Under Windows, no display device is able to display 16-bit gray levels. Windows doesn't allow you to display more than 256 gray levels.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The value of the pixel.

Methods

EBW16	Constructs a EBW16 object.

EBW16.EBW16

Constructs a EBW16 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW16(
 )
void EBW16(
 ushort value
 )
```

Parameters

value

The value of the pixel.

EBW16.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EBW16.Value

The value of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
ushort Value
```

5.6. EBW16Path Struct

Path from a EBW16 image: image pixel coordinates, and associated gray-level pixel value.

Namespace: Euresys.Open_eVision

Properties

Pixel	The value of the pixel at this coordinate.
X	Coordinate along the horizontal direction.
Y	Coordinate along the vertical direction.

EBW16Path.Pixel

The value of the pixel at this coordinate.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBW16 Pixel
```

EBW16Path.X

Coordinate along the horizontal direction.

Namespace: Euresys.Open_eVision

```
[C#]
int X
```

EBW16Path.Y

Coordinate along the vertical direction.

Namespace: Euresys.Open_eVision

```
[C#]
int Y
```

5.7. EBW32 Struct

Gray-level pixel value, coded as an unsigned 32-bit integer.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The value of the pixel.

Methods

EBW32	Constructs a EBW32 object.

EBW32.EBW32

Constructs a EBW32 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW32(
 )
```

```
void EBW32(
 uint value
 )
```

Parameters

value

The value of the pixel.

EBW32.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EBW32.Value

The value of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
uint Value
```

5.8. EBW32f Struct

Gray-level pixel value, coded as a 32-bit floating-point number.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The depth value of the pixel.

Methods

EBW32f	Constructs a EBW32f object.

EBW32f.EBW32f

Constructs a EBW32f object.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW32f(
 )
void EBW32f(
 float value
 )
```

Parameters

value

The depth value of the pixel.

EBW32f.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EBW32f.Value

The depth value of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
float Value
```

5.9. EBW8 Struct

Gray-level pixel value, coded as an unsigned 8-bit integer.

Remarks

Every pixel is coded on 8 bits, allowing to represent 256 different values. The value 0 stands for black (background) and the value 255 stands for white (foreground). The 254 remaining values stand for shades of gray. This is sufficient for most applications. Most of the Open eVision gray-level operations apply to this pixel type.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The value of the pixel.

Methods

EBW8	Constructs a EBW8 object.

EBW8.EBW8

Constructs a EBW8 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EBW8(
 )
void EBW8(
 byte value
 )
```

Parameters

value

The value of the pixel.

EBW8.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EBW8.Value

The value of the pixel.

Namespace: Euresys.Open_eVision

[C#]

```
byte Value
```

5.10. EBW8Path Struct

Path from a EBW8 image: image pixel coordinates, and associated gray-level pixel value.

Namespace: Euresys.Open_eVision

Properties

Pixel	The value of the pixel at this coordinate.
X	Coordinate along the horizontal direction.
Y	Coordinate along the vertical direction.

EBW8Path.Pixel

The value of the pixel at this coordinate.

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EBW8 Pixel
```

EBW8Path.X

Coordinate along the horizontal direction.

Namespace: Euresys.Open_eVision

[C#]

```
int X
```

EBW8Path.Y

Coordinate along the vertical direction.

Namespace: Euresys.Open_eVision

```
[C#]
int Y
```

5.11. EC15 Struct

Color pixel value, coded as 3 fields of 5 bits each (red, green, blue components) and 1 field of 1 bit for padding.

Remarks

This class is suited to handle the Windows RGB15 color images. The pixel values are coded on 15 bits, leaving 32 possible levels per color component (red, green or blue).

Namespace: Euresys.Open_eVision

Properties

C0	The value of the first component of the pixel (red channel).
C1	The value of the second component of the pixel (green channel).
C2	The value of the third component of the pixel (blue channel).
Size	The number of bits in a pixel

Methods

EC15	Constructs a EC15 object.

EC15.C0

The value of the first component of the pixel (red channel).

Namespace: Euresys.Open_eVision

```
[C#]
ushort C0
```

EC15.C1

The value of the second component of the pixel (green channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C1
```

EC15.C2

The value of the third component of the pixel (blue channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C2
```

EC15.EC15

Constructs a EC15 object.

Namespace: Euresys.Open_eVision

[C#]

```
void EC15(
 )

void EC15(
 byte c0,
 byte c1,
 byte c2
 )
```

Parameters

c0

The value of the first component of the pixel (red channel).

c1

The value of the second component of the pixel (green channel).

c2

The value of the third component of the pixel (blue channel).

EC15.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

[C#]

```
static int Size
```

```
{ get; }
```

5.12. EC16 Struct

Color pixel value, coded as 3 fields of 5 bits, 6 bits and 5 bits (red, green and blue components).

Remarks

This class is suited to handle the Windows RGB16 color images. The pixel values are coded on 16 bits (5-6-5), leaving 32 possible levels for R and B components, and 64 possible levels for G component.

Namespace: Euresys.Open_eVision

Properties

C0	The value of the first component of the pixel (red channel).
C1	The value of the second component of the pixel (green channel).
C2	The value of the third component of the pixel (blue channel).
Size	The number of bits in a pixel

Methods

EC16	Constructs a EC16 object.

EC16.C0

The value of the first component of the pixel (red channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C0
```

EC16.C1

The value of the second component of the pixel (green channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C1
```

EC16.C2

The value of the third component of the pixel (blue channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C2
```

EC16.EC16

Constructs a EC16 object.

Namespace: Euresys.Open_eVision

[C#]

```
void EC16(
 )

void EC16(
 byte c0,
 byte c1,
 byte c2
 )
```

Parameters

c0
The value of the first component of the pixel (red channel).

c1
The value of the second component of the pixel (green channel).

c2
The value of the third component of the pixel (blue channel).

EC16.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

[C#]

```
static int Size
  { get; }
```

5.13. EC24 Struct

Color pixel value coded as 3 unsigned 8-bit integers (red, green and blue components).

Remarks

(RGB triplet, windows 24 bpp bitmap format) The pixel values are coded on 24 bits, providing 256 possible levels per color component. This way, RGB images can represent 16,777,216 different colors. This is sufficient for most applications. Most of the Open eVision color operations apply to this pixel type.

Namespace: Euresys.Open_eVision

Properties

C0	The value of the first component of the pixel (red channel).
C1	The value of the second component of the pixel (green channel).
C2	The value of the third component of the pixel (blue channel).
Size	The number of bits in a pixel

Methods

EC24	Constructs a EC24 object.

EC24.C0

The value of the first component of the pixel (red channel).

Namespace: Euresys.Open_eVision

```
[C#]
byte C0
```

EC24.C1

The value of the second component of the pixel (green channel).

Namespace: Euresys.Open_eVision

```
[C#]
byte C1
```

EC24.C2

The value of the third component of the pixel (blue channel).

Namespace: Euresys.Open_eVision

```
[C#]
byte C2
```

EC24.EC24

Constructs a EC24 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EC24(
 )
void EC24(
 Euresys.Open_eVision.ERGBColor rgbColor
 )
void EC24(
 byte c0,
 byte c1,
 byte c2
 )
```

Parameters

rgbColor

-

c0

The value of the first component of the pixel (red channel).

c1

The value of the second component of the pixel (green channel).

c2

The value of the third component of the pixel (blue channel).

EC24.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

5.14. EC24A Struct

Color pixel value coded as 4 unsigned 8-bit integers (red, green, blue and alpha components).

Remarks

This class is suited to handle the Windows RGB32 color format. The pixel values are coded on 32 bits, leaving 256 possible levels per color component (red, green or blue), and 8 more bits for an alpha channel. Currently, the alpha channel is not used for any purpose in the Open eVision processing functions. Users are free to use it to store an additional gray-level content.

Namespace: Euresys.Open_eVision

Properties

A	The value of the alpha component of the pixel.
C0	The value of the first component of the pixel (red channel).
C1	The value of the second component of the pixel (green channel).
C2	The value of the third component of the pixel (blue channel).
Size	The number of bits in a pixel

Methods

EC24A	Constructs a EC24A object.

EC24A.A

The value of the alpha component of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
byte A
```

EC24A.C0

The value of the first component of the pixel (red channel).

Namespace: Euresys.Open_eVision

```
[C#]
byte C0
```

EC24A.C1

The value of the second component of the pixel (green channel).

Namespace: Euresys.Open_eVision

[C#]

```
byte C1
```

EC24A.C2

The value of the third component of the pixel (blue channel).

Namespace: Euresys.Open_eVision

[C#]

```
byte C2
```

EC24A.EC24A

Constructs a EC24A object.

Namespace: Euresys.Open_eVision

[C#]

```
void EC24A(
 )

void EC24A(
 byte c0,
 byte c1,
 byte c2,
 byte a
 )
```

Parameters

c0

The value of the first component of the pixel (red channel).

c1

The value of the second component of the pixel (green channel).

c2

The value of the third component of the pixel (blue channel).

a

-

EC24A.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

5.15. EC24Path Struct

Path from a EC24 image: image pixel coordinates, and associated color pixel value.

Namespace: Euresys.Open_eVision

Properties

Pixel	The value of the pixel at this coordinate.
X	Coordinate along the horizontal direction.
Y	Coordinate along the vertical direction.

EC24Path.Pixel

The value of the pixel at this coordinate.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EC24 Pixel
```

EC24Path.X

Coordinate along the horizontal direction.

Namespace: Euresys.Open_eVision

```
[C#]
int X
```

EC24Path.Y

Coordinate along the vertical direction.

Namespace: Euresys.Open_eVision

```
[C#]
int Y
```

5.16. EC48 Struct

Color pixel value coded as 3 unsigned 16-bit integers (red, green, blue components).

Namespace: Euresys.Open_eVision

Properties

C0	The value of the first component of the pixel (red channel).
C1	The value of the second component of the pixel (green channel).
C2	The value of the third component of the pixel (blue channel).
Size	The size of a pixel.

Methods

EC48	Constructs a EC48 object.

EC48.C0

The value of the first component of the pixel (red channel).

Namespace: Euresys.Open_eVision

```
[C#]
ushort C0
```

EC48.C1

The value of the second component of the pixel (green channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C1
```

EC48.C2

The value of the third component of the pixel (blue channel).

Namespace: Euresys.Open_eVision

[C#]

```
ushort C2
```

EC48.EC48

Constructs a EC48 object.

Namespace: Euresys.Open_eVision

[C#]

```
void EC48(
 )

void EC48(
 ushort c0,
 ushort c1,
 ushort c2
 )
```

Parameters

c0

The value of the first component of the pixel (red channel).

c1

The value of the second component of the pixel (green channel).

c2

The value of the third component of the pixel (blue channel).

EC48.Size

The size of a pixel.

Namespace: Euresys.Open_eVision

[C#]

```
static int Size
```

```
{ get; }
```

5.17. EColor Struct

Triple of floating-point numbers that encode a color in a given color system.

Namespace: Euresys.Open_eVision

Properties

C0	First color component.
C1	Second color component.
C2	Third color component.

Methods

EColor	Constructor for EColor objects.

EColor.C0

First color component.

Namespace: Euresys.Open_eVision

```
[C#]
float C0
```

EColor.C1

Second color component.

Namespace: Euresys.Open_eVision

```
[C#]
float C1
```

EColor.C2

Third color component.

Namespace: Euresys.Open_eVision

```
[C#]
float C2
```

EColor.EColor

Constructor for EColor objects.

Namespace: Euresys.Open_eVision

```
[C#]
void EColor(
 )
void EColor(
 float c0,
 float c1,
 float c2
 )
```

Parameters

c0
value for the first color component

c1
value for the second color component

c2
value for the third color component

5.18. EDepth16 Struct

Depth value of the pixel, coded as an unsigned 16-bit integer.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The depth value of the pixel.

Methods

EDepth16	Constructs a EDepth16 object.

EDepth16.EDepth16

Constructs a EDepth16 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EDepth16(
 )
void EDepth16(
 ushort value
 )
```

Parameters

value

The depth value of the pixel.

EDepth16.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EDepth16.Value

The depth value of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
ushort Value
```

5.19. EDepth32f Struct

Depth value of the pixel, coded as a 32-bits floating point value.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The depth value of the pixel.

Methods

EDepth32f	Constructs a EDepth32f object.

EDepth32f.EDepth32f

Constructs a EDepth32f object.

Namespace: Euresys.Open_eVision

```
[C#]
void EDepth32f(
 )
void EDepth32f(
 float value
 )
```

Parameters

value

The depth value of the pixel.

EDepth32f.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EDepth32f.Value

The depth value of the pixel.

Namespace: Euresys.Open_eVision

```
[C#]
float Value
```

5.20. EDepth8 Struct

Depth value of the pixel, coded as an unsigned 8-bit integer.

Namespace: Euresys.Open_eVision

Properties

Size	The number of bits in a pixel
Value	The depth value of the pixel.

Methods

EDepth8	Constructs a EDepth8 object.

EDepth8.EDepth8

Constructs a EDepth8 object.

Namespace: Euresys.Open_eVision

```
[C#]
void EDepth8(
 )
void EDepth8(
 byte value
 )
```

Parameters

value

The depth value of the pixel.

EDepth8.Size

The number of bits in a pixel

Namespace: Euresys.Open_eVision

```
[C#]
static int Size
  { get; }
```

EDepth8.Value

The depth value of the pixel.

Namespace: Euresys.Open_eVision

[C#]

```
byte Value
```

5.21. EFeatureData Struct

This struct is deprecated.

Describes object features.

Remarks

A feature is associated to an array of values, each corresponding to an object of given identification number. A feature is also characterized by the size of the array, a feature number, data size/type information and pointers to both ends of the array. The features can be accessed by their number (see EFeature). To obtain the value of a given feature of a given object, just use the class member ECodedImage::GetObjectFeature. This enumeration pertains to the EasyObject legacy API and should not be used for new developments. See ECodedImage2 for the new API.

Namespace: Euresys.Open_eVision

Properties

FeatDataSize	Data size (see EDataSize).
FeatDataType	Data type (see EDataType).
FeatNum	Code (see EFeature).
Size	Number of objects for which the feature is stored.

EFeatureData.FeatDataSize

This struct member is deprecated.

Data size (see EDataSize).

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EDataSize FeatDataSize
```

EFeatureData.FeatDataType

This struct member is deprecated.

Data type (see EDataType).

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EDataType FeatDataType
```

EFeatureData.FeatNum

This struct member is deprecated.

Code (see EFeature).

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ELegacyFeature FeatNum
```

EFeatureData.Size

This struct member is deprecated.

Number of objects for which the feature is stored.

Namespace: Euresys.Open_eVision

```
[C#]
int Size
```

5.22. EISH Struct

Intensity, Saturation, Hue color system.

Namespace: Euresys.Open_eVision

Properties

H	Hue component.
I	Intensity component.
S	Saturation component.

EISH.H

Hue component.

Namespace: Euresys.Open_eVision

[C#]
```
float H
```

EISH.I

Intensity component.

Namespace: Euresys.Open_eVision

[C#]
```
float I
```

EISH.S

Saturation component.

Namespace: Euresys.Open_eVision

[C#]
```
float S
```

5.23. ELAB Struct

CIE Lightness, a*, b* color system.

Namespace: Euresys.Open_eVision

Properties

A	a* component.
B	b* component.
L	Lightness component.

ELAB.A

a* component.

Namespace: Euresys.Open_eVision

```
[C#]
float A
```

ELAB.B

b* component.

Namespace: Euresys.Open_eVision

```
[C#]
float B
```

ELAB.L

Lightness component.

Namespace: Euresys.Open_eVision

```
[C#]
float L
```

5.24. ELCH Struct

Lightness, Chroma, Hue color system.

Namespace: Euresys.Open_eVision

Properties

C	Chroma component.
H	Hue component.
L	Lightness component.

ELCH.C

Chroma component.

Namespace: Euresys.Open_eVision

[C#]

```
float C
```

ELCH.H

Hue component.

Namespace: Euresys.Open_eVision

[C#]

```
float H
```

ELCH.L

Lightness component.

Namespace: Euresys.Open_eVision

[C#]

```
float L
```

5.25. ELSH Struct

Lightness, Saturation, Hue color system.

Namespace: Euresys.Open_eVision

Properties

H	Hue component.
L	Lightness component.
S	Saturation component.

ELSH.H

Hue component.

Namespace: Euresys.Open_eVision

[C#]

```
float H
```

ELSH.L

Lightness component.

Namespace: Euresys.Open_eVision

```
[C#]
float L
```

ELSH.S

Saturation component.

Namespace: Euresys.Open_eVision

```
[C#]
float S
```

5.26. ELUV Struct

CIE Lightness, u*, v* color system.

Namespace: Euresys.Open_eVision

Properties

L	Lightness component.
U	u* component.
V	v* component.

ELUV.L

Lightness component.

Namespace: Euresys.Open_eVision

```
[C#]
float L
```

ELUV.U

u* component.

Namespace: Euresys.Open_eVision

```
[C#]
float U
```

ELUV.V

v* component.

Namespace: Euresys.Open_eVision

```
[C#]
float V
```

5.27. EMatchPosition Struct

Represents a single instance of the pattern in the search field, as returned by the EasyMatch matching process.

Remarks

EMatcher::GetPosition returns instances of this class. A EMatchPosition object represents one matched instance, with all the needed information about it.

Namespace: Euresys.Open_eVision

Properties

Angle	Clockwise rotation angle, expressed using the current angle unit, of the pattern found in the image.
AreaRatio	Ratio between the found pattern area inside the search ROI and its complete area.
CenterX	Abscissa of the center of the pattern found in the image.
CenterY	Ordinate of the center of the pattern found in the image.
Interpolated	Indicates whether sub-pixel interpolation was actually performed on the position.
Scale	Scale factor of the pattern found in the image.
ScaleX	Measured horizontal scaling of the pattern found in the image, expressed as a dimensionless ratio.
ScaleY	Measured vertical scaling of the pattern found in the image, expressed as a dimensionless ratio.
Score	Indicates how good a matching was.

Methods

ToRegion	Creates an ERegion from the EMatchPosition. The ERegion represents all the pixels which are within the bounding box of the EMatchPosition.

EMatchPosition.Angle

Clockwise rotation angle, expressed using the current angle unit, of the pattern found in the image.

Namespace: Euresys.Open_eVision

```
[C#]
float Angle
```

Remarks

0 if no rotation is allowed.

EMatchPosition.AreaRatio

Ratio between the found pattern area inside the search ROI and its complete area.

Namespace: Euresys.Open_eVision

```
[C#]
float AreaRatio
```

EMatchPosition.CenterX

Abscissa of the center of the pattern found in the image.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterX
```

EMatchPosition.CenterY

Ordinate of the center of the pattern found in the image.

Namespace: Euresys.Open_eVision

```
[C#]
float CenterY
```

EMatchPosition.Interpolated

Indicates whether sub-pixel interpolation was actually performed on the position.

Namespace: Euresys.Open_eVision

```
[C#]
bool Interpolated
```

Remarks

In some cases, when the pattern is found close to the ROI edge, sub-pixel interpolation cannot be used.

EMatchPosition.Scale

Scale factor of the pattern found in the image.

Namespace: Euresys.Open_eVision

```
[C#]
float Scale
```

Remarks

1 if no scaling is allowed.

EMatchPosition.ScaleX

Measured horizontal scaling of the pattern found in the image, expressed as a dimensionless ratio.

Namespace: Euresys.Open_eVision

```
[C#]
float ScaleX
```

EMatchPosition.ScaleY

Measured vertical scaling of the pattern found in the image, expressed as a dimensionless ratio.

Namespace: Euresys.Open_eVision

```
[C#]
float ScaleY
```

EMatchPosition.Score

Indicates how good a matching was.

Namespace: Euresys.Open_eVision

```
[C#]
float Score
```

Remarks

1 means that the matching was perfect. Lower values correspond to approximate matching; -1 corresponds to a perfect mismatch (pattern superimposed on its negative image).

EMatchPosition.ToRegion

Creates an ERegion from the EMatchPosition. The ERegion represents all the pixels which are within the bounding box of the EMatchPosition.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.ERegion ToRegion(
 int modelWidth,
 int modelHeight
 )
```

Parameters

modelWidth

Width of the corresponding EasyMatch model.

modelHeight

Height of the corresponding EasyMatch model.

5.28. EMatrixCodeIso15415GradingParameters Struct

Holds all grading parameters pertaining to ISO/IEC 15415

Namespace: Euresys.Open_eVision

Properties

AxialNonUniformity	Axial Non Uniformity
AxialNonUniformityGrade	Axial Non Uniformity Grade

DecodingGrade	-
FixedPatternDamageGrade	Fixed Pattern Damage Grade
GridNonUniformity	Grid Non Uniformity
GridNonUniformityGrade	Grid Non Uniformity Grade
HorizontalPrintGrowth	Horizontal Print Growth
ModulationGrade	Modulation Grade
OverallSymbolGrade	Overall Symbol Grade
ReflectanceMarginGrade	Reflectance Margin Grade
ScanGrade	Scan Grade
SymbolContrast	Symbol Contrast
SymbolContrastGrade	Symbol Contrast Grade
UnusedErrorCorrection	Unused Error Correction
UnusedErrorCorrectionGrade	Unused Error Correction Grade
VerticalPrintGrowth	Vertical Print Growth

Methods

EMatrixCodeIso15415GradingParameters	-

EMatrixCodeIso15415GradingParameters.AxialNonUniformity

Axial Non Uniformity

Namespace: Euresys.Open_eVision

```
[C#]
float AxialNonUniformity
```

EMatrixCodeIso15415GradingParameters.AxialNonUniformityGrade

Axial Non Uniformity Grade

Namespace: Euresys.Open_eVision

```
[C#]
int AxialNonUniformityGrade
```

EMatrixCodeIso15415GradingParameters.DecodingGrade

-

Namespace: Euresys.Open_eVision

```
[C#]
int DecodingGrade
```

EMatrixCodeIso15415GradingParameters.EMatrixCodeIso15415GradingParameters

-

Namespace: Euresys.Open_eVision

```
[C#]
void EMatrixCodeIso15415GradingParameters(
 )
```

EMatrixCodeIso15415GradingParameters.FixedPatternDamageGrade

Fixed Pattern Damage Grade

Namespace: Euresys.Open_eVision

```
[C#]
int FixedPatternDamageGrade
```

EMatrixCodeIso15415GradingParameters.GridNonUniformity

Grid Non Uniformity

Namespace: Euresys.Open_eVision

```
[C#]
float GridNonUniformity
```

EMatrixCodeIso15415GradingParameters.GridNonUniformityGrade

Grid Non Uniformity Grade

Namespace: Euresys.Open_eVision

[C#]

```
int GridNonUniformityGrade
```

EMatrixCodeIso15415GradingParameters.HorizontalPrintGrowth

Horizontal Print Growth

Namespace: Euresys.Open_eVision

[C#]

```
float HorizontalPrintGrowth
```

EMatrixCodeIso15415GradingParameters.ModulationGrade

Modulation Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ModulationGrade
```

EMatrixCodeIso15415GradingParameters.OverallSymbolGrade

This struct member is deprecated.

Overall Symbol Grade

Namespace: Euresys.Open_eVision

[C#]

```
int OverallSymbolGrade
```

EMatrixCodeIso15415GradingParameters.ReflectanceMarginGrade

Reflectance Margin Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ReflectanceMarginGrade
```

EMatrixCodeIso15415GradingParameters.ScanGrade

Scan Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ScanGrade
```

EMatrixCodeIso15415GradingParameters.SymbolContrast

Symbol Contrast

Namespace: Euresys.Open_eVision

[C#]

```
float SymbolContrast
```

EMatrixCodeIso15415GradingParameters.SymbolContrastGrade

Symbol Contrast Grade

Namespace: Euresys.Open_eVision

[C#]

```
int SymbolContrastGrade
```

EMatrixCodeIso15415GradingParameters.UnusedErrorCorrection

Unused Error Correction

Namespace: Euresys.Open_eVision

[C#]

```
float UnusedErrorCorrection
```

EMatrixCodeIso15415GradingParameters.UnusedErrorCorrectionGrade

Unused Error Correction Grade

Namespace: Euresys.Open_eVision

[C#]

```
int UnusedErrorCorrectionGrade
```

EMatrixCodeIso15415GradingParameters.VerticalPrintGrowth

Vertical Print Growth

Namespace: Euresys.Open_eVision

[C#]

```
float VerticalPrintGrowth
```

5.29. EMatrixCodeIso29158CalibrationParameters Struct

Holds all grading inputs pertaining to ISO/IEC 29158

Namespace: Euresys.Open_eVision

Properties

MLcal	Mean of the light from a histogram of the calibrated standard.
Rcal	Reported reflectance value, from a calibration standard.
SRcal	System response parameters(such as exposure and/or gain) used to create an image of the calibration standard.
SRtarget	System response parameters(such as exposure and/or gain) used to create an image of the symbole under test.

Methods

EMatrixCodeIso29158CalibrationParameters	-

EMatrixCodeIso29158CalibrationParameters.EMatrixCodeIso29158CalibrationParameters

-

Namespace: Euresys.Open_eVision

```
[C#]
void EMatrixCodeIso29158CalibrationParameters(
 )
```

EMatrixCodeIso29158CalibrationParameters.MLcal

Mean of the light from a histogram of the calibrated standard.

Namespace: Euresys.Open_eVision

```
[C#]
float MLcal
```

EMatrixCodeIso29158CalibrationParameters.Rcal

Reported reflectance value, from a calibration standard.

Namespace: Euresys.Open_eVision

```
[C#]
float Rcal
```

EMatrixCodeIso29158CalibrationParameters.SRcal

System response parameters(such as exposure and/or gain) used to create an image of the calibration standard.

Namespace: Euresys.Open_eVision

```
[C#]
float SRcal
```

EMatrixCodeIso29158CalibrationParameters.SRtarget

System response parameters(such as exposure and/or gain) used to create an image of the symbole under test.

Namespace: Euresys.Open_eVision

```
[C#]
float SRtarget
```

5.30. EMatrixCodeIso29158GradingParameters Struct

Holds all grading parameters pertaining to ISO/IEC 29158

Namespace: Euresys.Open_eVision

Properties

CellContrastGrade	-
CellModulationGrade	Cell Modulation Grade
FixedPatternDamageGrade	FixedPatternDamageGrade
IsMeanLightInRequiredBounds	Is Mean Light In Required Bounds
MeanLight	Mean Light
MinimumReflectanceGrade	Minimum Reflectance Grade
OverallSymbolGrade	Overall Symbol Grade
ScanGrade	Scan Grade

Methods

EMatrixCodeIso29158GradingParameters	-

EMatrixCodeIso29158GradingParameters.CellContrastGrade

-

Namespace: Euresys.Open_eVision

[C#]

```
int CellContrastGrade
```

EMatrixCodeIso29158GradingParameters.CellModulationGrade

Cell Modulation Grade

Namespace: Euresys.Open_eVision

[C#]

```
int CellModulationGrade
```

EMatrixCodeIso29158GradingParameters.EMatrixCodeIso29158GradingParameters

-

Namespace: Euresys.Open_eVision

[C#]

```
void EMatrixCodeIso29158GradingParameters(
 )
```

EMatrixCodeIso29158GradingParameters.FixedPatternDamageGrade

FixedPatternDamageGrade

Namespace: Euresys.Open_eVision

[C#]

```
int FixedPatternDamageGrade
```

EMatrixCodeIso29158GradingParameters.IsMeanLightInRequiredBounds

Is Mean Light In Required Bounds

Namespace: Euresys.Open_eVision

[C#]

```
bool IsMeanLightInRequiredBounds
```

EMatrixCodeIso29158GradingParameters.MeanLight

Mean Light

Namespace: Euresys.Open_eVision

[C#]

```
float MeanLight
```

EMatrixCodeIso29158GradingParameters.MinimumReflectanceGrade

Minimum Reflectance Grade

Namespace: Euresys.Open_eVision

[C#]

```
int MinimumReflectanceGrade
```

EMatrixCodeIso29158GradingParameters.OverallSymbolGrade

This struct member is deprecated.

Overall Symbol Grade

Namespace: Euresys.Open_eVision

[C#]

```
int OverallSymbolGrade
```

EMatrixCodeIso29158GradingParameters.ScanGrade

Scan Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ScanGrade
```

5.31. EMatrixCodeSemiT10GradingParameters Struct

Holds all grading parameters pertaining to Semi T10-

Namespace: Euresys.Open_eVision

Properties

CellDefects	Cell Defects
DataMatrixCellHeight	Data Matrix Cell Height
DataMatrixCellWidth	Data Matrix Cell Width
FinderPatternDefects	Finder Pattern Defects

HorizontalMarkGrowth	Horizontal Mark Growth
HorizontalMarkMisplacement	Horizontal Mark Misplacement
SymbolContrast	Symbol Contrast
SymbolContrastSNR	Symbol Contrast SNR
UnusedErrorCorrection	Unused Error Correction
VerticalMarkGrowth	Vertical Mark Growth
VerticalMarkMisplacement	Vertical Mark Misplacement

Methods

EMatrixCodeSemiT10GradingParameters	-

EMatrixCodeSemiT10GradingParameters.CellDefects

Cell Defects

Namespace: Euresys.Open_eVision

[C#]

```
float CellDefects
```

EMatrixCodeSemiT10GradingParameters.DataMatrixCellHeight

Data Matrix Cell Height

Namespace: Euresys.Open_eVision

[C#]

```
float DataMatrixCellHeight
```

EMatrixCodeSemiT10GradingParameters.DataMatrixCellWidth

Data Matrix Cell Width

Namespace: Euresys.Open_eVision

[C#]

```
float DataMatrixCellWidth
```

EMatrixCodeSemiT10GradingParameters.EMatrixCodeSemiT10GradingParameters

-

Namespace: Euresys.Open_eVision

```
[C#]
void EMatrixCodeSemiT10GradingParameters(
 )
```

EMatrixCodeSemiT10GradingParameters.FinderPatternDefects

Finder Pattern Defects

Namespace: Euresys.Open_eVision

```
[C#]
float FinderPatternDefects
```

EMatrixCodeSemiT10GradingParameters.HorizontalMarkGrowth

Horizontal Mark Growth

Namespace: Euresys.Open_eVision

```
[C#]
float HorizontalMarkGrowth
```

EMatrixCodeSemiT10GradingParameters.HorizontalMarkMisplacement

Horizontal Mark Misplacement

Namespace: Euresys.Open_eVision

```
[C#]
float HorizontalMarkMisplacement
```

EMatrixCodeSemiT10GradingParameters.SymbolContrast

Symbol Contrast

Namespace: Euresys.Open_eVision

[C#]

```
float SymbolContrast
```

EMatrixCodeSemiT10GradingParameters.SymbolContrastSNR

Symbol Contrast SNR

Namespace: Euresys.Open_eVision

[C#]

```
float SymbolContrastSNR
```

EMatrixCodeSemiT10GradingParameters.UnusedErrorCorrection

Unused Error Correction

Namespace: Euresys.Open_eVision

[C#]

```
float UnusedErrorCorrection
```

EMatrixCodeSemiT10GradingParameters.VerticalMarkGrowth

Vertical Mark Growth

Namespace: Euresys.Open_eVision

[C#]

```
float VerticalMarkGrowth
```

EMatrixCodeSemiT10GradingParameters.VerticalMarkMisplacement

Vertical Mark Misplacement

Namespace: Euresys.Open_eVision

[C#]

```
float VerticalMarkMisplacement
```

5.32. EMatrixPosition Struct

Represents a position in a 2D Matrix.

Namespace: Euresys.Open_eVision

Properties

X	X position.
Y	Y position.

Methods

EMatrixPosition	Constructs a default EMatrixPosition object.
operator!=	Checks if two EMatrixPosition are stricly different
operator==	Checks if two EMatrixPosition are stricly equal

EMatrixPosition.EMatrixPosition

Constructs a default EMatrixPosition object.

Namespace: Euresys.Open_eVision

```
[C#]
void EMatrixPosition(
 )
void EMatrixPosition(
 int x,
 int y
 )
```

Parameters

x

X position.

y

Y position.

Remarks

If the default constructor is used, the position is initialized to (0, 0).

EMatrixPosition.operator!=

Checks if two EMatrixPosition are stricly different

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.EMatrixPosition position
 )
```

Parameters

position

The other position.

EMatrixPosition.operator==

Checks if two EMatrixPosition are stricly equal

Namespace: Euresys.Open_eVision

[C#]

```
bool operator==(
 Euresys.Open_eVision.EMatrixPosition position
 )
```

Parameters

position

The other position.

EMatrixPosition.X

X position.

Namespace: Euresys.Open_eVision

[C#]

```
int X
```

EMatrixPosition.Y

Y position.

Namespace: Euresys.Open_eVision

[C#]

```
int Y
```

5.33. EObjectData Struct

This struct is deprecated.

Describes objects.

Remarks

An object is characterized by a class, a unique identification number, the number of its constituent runs, the number of its holes (if the object is a real object, not a hole), a selection flag, an identification flag (real object or hole) and the list of its constituent runs. After the object construction phase (real objects and eventually holes), all the objects are gathered in a single dynamic list. The objects can be accessed by their absolute position in the list as well as by their identification number. This structure pertains to the EasyObject legacy API and should not be used for new developments.

Note. After a sorting operation, the objects retain their identification number, not their absolute position in the list. If need be, the list of runs of an object can be traversed by means of the following functions: GetObjNbRun, ECodedImage::GetObjFirstRunPtr, ECodedImage::GetObjLastRunPtr.

Namespace: Euresys.Open_eVision

Properties

Class	Class code.
IsHole	true if the object is a hole, false otherwise.
IsSelected	Selection flag.
ObjNbHole	Number of holes.
ObjNbRun	Number of runs.
ObjNum	Identification number.

EObjectData.Class

This struct member is deprecated.

Class code.

Namespace: Euresys.Open_eVision

[C#]

```
int Class
```

EObjectData.IsHole

This struct member is deprecated.

true if the object is a hole, false otherwise.

Namespace: Euresys.Open_eVision

```
[C#]
bool IsHole
```

EObjectData.IsSelected

This struct member is deprecated.

Selection flag.

Namespace: Euresys.Open_eVision

```
[C#]
byte IsSelected
```

EObjectData.ObjNbHole

This struct member is deprecated.

Number of holes.

Namespace: Euresys.Open_eVision

```
[C#]
int ObjNbHole
```

EObjectData.ObjNbRun

This struct member is deprecated.

Number of runs.

Namespace: Euresys.Open_eVision

```
[C#]
int ObjNbRun
```

EObjectData.ObjNum

This struct member is deprecated.

Identification number.

Namespace: Euresys.Open_eVision

[C#]

```
int ObjNum
```

5.34. EOCR2CharacterCandidate Struct

Holds a single recognition score for a detected character from the image

Remarks

The variable "code" contains the ASCII-representation of the reference character from the database. The variable "score" contains the recognition score between the detected character and the reference character.

Namespace: Euresys.Open_eVision

Properties

Code	Contains the ASCII-representation of the reference character from the database.
Score	Contains the recognition score between the detected character and the reference character.

Methods

EOCR2CharacterCandidate	Constructs an EOCR2CharacterCandidate context.

EOCR2CharacterCandidate.Code

Contains the ASCII-representation of the reference character from the database.

Namespace: Euresys.Open_eVision

[C#]

```
ushort Code
```

EOCR2CharacterCandidate.EOCR2CharacterCandidate

Constructs an EOCR2CharacterCandidate context.

Namespace: Euresys.Open_eVision

[C#]

```
void EOCR2CharacterCandidate(
 )
void EOCR2CharacterCandidate(
 ushort code,
 float score
 )
```

Parameters

code

-

score

-

EOCR2CharacterCandidate.Score

Contains the recognition score between the detected character and the reference character.

Namespace: Euresys.Open_eVision

[C#]

```
float Score
```

5.35. EPath Struct

Path from an image: image pixel coordinates.

Namespace: Euresys.Open_eVision

Properties

X	Coordinate along the horizontal direction.
Y	Coordinate along the vertical direction.

EPath.X

Coordinate along the horizontal direction.

Namespace: Euresys.Open_eVision

[C#]

```
int X
```

EPath.Y

Coordinate along the vertical direction.

Namespace: Euresys.Open_eVision

[C#]

```
int Y
```

5.36. EPeak Struct

Represents a peak in a profile.

Namespace: Euresys.Open_eVision

Properties

Amplitude	Amplitude of the peak.
Area	Area of the peak.
Center	Center of the peak.
Length	Length of the peak.
Start	Start of the peak.

EPeak.Amplitude

Amplitude of the peak.

Namespace: Euresys.Open_eVision

[C#]

```
int Amplitude
```

EPeak.Area

Area of the peak.

Namespace: Euresys.Open_eVision

[C#]

```
int Area
```

EPeak.Center

Center of the peak.

Namespace: Euresys.Open_eVision

[C#]

```
float Center
```

EPeak.Length

Length of the peak.

Namespace: Euresys.Open_eVision

[C#]

```
uint Length
```

EPeak.Start

Start of the peak.

Namespace: Euresys.Open_eVision

[C#]

```
uint Start
```

5.37. EPen Struct

Pen.

Namespace: Euresys.Open_eVision

Properties

Brush	Brush used to draw the content of the pen.
Style	Style of the pen.
Width	Width of the pen.

Methods

EPen	Constructs an EPen.

IsValid	Whether the pen is valid, i.e. when its brush is valid and its width is bigger than 0.
Load	Loads the EPen. The given ESerializer must have been created for reading.
operator!=	Inequality operator.
operator==	Equality operator.
Save	Saves the EPen. The given ESerializer must have been created for writing.
Serialize	Serializes the EPen.

EPen.Brush

Brush used to draw the content of the pen.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EBrush Brush
```

EPen.EPen

Constructs an EPen.

Namespace: Euresys.Open_eVision

```
[C#]
void EPen(
 )

void EPen(
 Euresys.Open_eVision.ERGBColor color,
 int width,
 Euresys.Open_eVision.EPenStyle style
 )

void EPen(
 Euresys.Open_eVision.ERGBColor color,
 float opacity,
 int width,
 Euresys.Open_eVision.EPenStyle style
 )

void EPen(
 Euresys.Open_eVision.EBrush brush,
 int width,
 Euresys.Open_eVision.EPenStyle style
 )
```

Parameters

color
Color of the pen.
width
Width of the pen.
style
Style of the pen.
opacity
-
brush
Brush of the pen.

EPen.IsValid

Whether the pen is valid, i.e. when its brush is valid and its width is bigger than 0.

Namespace: Euresys.Open_eVision

[C#]

```
bool IsValid(
 )
```

EPen.Load

Loads the EPen. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision

[C#]

```
void Load(
 string path
 )

void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.
serializer
The serializer.

EPen.operator!=

Inequality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.EPen other
 )
```

Parameters

other

Other pen to compare with.

EPen.operator==

Equality operator.

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.EPen other
 )
```

Parameters

other

Other pen to compare with.

EPen.Save

Saves the EPen. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision

```
[C#]
void Save(
 string path
 )

void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path
The file path.

serializer
The ESerializer object that is written to.

EPen.Serialize

Serializes the EPen.

Namespace: Euresys.Open_eVision

```
[C#]
void Serialize(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

serializer
Serializer

EPen.Style

Style of the pen.

Namespace: Euresys.Open_eVision

```
[C#]
Euresys.Open_eVision.EPenStyle Style
```

EPen.Width

Width of the pen.

Namespace: Euresys.Open_eVision

```
[C#]
int Width
```

5.38. EQRCodeAdditionalParametersGrades Struct

Holds all grading inputs pertaining to ISO/IEC 29158

Namespace: Euresys.Open_eVision

Properties

FormatInformationGrade	Format Information Grade.
VersionInformationGrade	Version Information Grade. Value is -1 if not available.

Methods

EQRCodeAdditionalParametersGrades	-

EQRCodeAdditionalParametersGrades.EQRCodeAdditionalParametersGrades

-

Namespace: Euresys.Open_eVision

```
[C#]
void EQRCodeAdditionalParametersGrades(
 )
```

EQRCodeAdditionalParametersGrades.FormatInformationGrade

Format Information Grade.

Namespace: Euresys.Open_eVision

```
[C#]
int FormatInformationGrade
```

EQRCodeAdditionalParametersGrades.VersionInformationGrade

Version Information Grade. Value is -1 if not available.

Namespace: Euresys.Open_eVision

```
[C#]
int VersionInformationGrade
```

5.39. EQRCodeIso15415GradingParameters Struct

Holds all grading parameters pertaining to ISO/IEC 15415

Namespace: Euresys.Open_eVision

Properties

AdditionalParametersGrades	Additional Parameters Grades
AxialNonUniformity	Axial Non Uniformity
AxialNonUniformityGrade	Axial Non Uniformity Grade
DecodingGrade	-
FixedPatternDamageGrade	Fixed Pattern Damage Grade
GridNonUniformity	Grid Non Uniformity
GridNonUniformityGrade	Grid Non Uniformity Grade
HorizontalPrintGrowth	Horizontal Print Growth
ModulationGrade	Modulation Grade
OverallSymbolGrade	Overall Symbol Grade
ReflectanceMarginGrade	Reflectance Margin Grade
ScanGrade	Scan Grade
SymbolContrast	Symbol Contrast
SymbolContrastGrade	Symbol Contrast Grade
UnusedErrorCorrection	Unused Error Correction
UnusedErrorCorrectionGrade	Unused Error Correction Grade
VerticalPrintGrowth	Vertical Print Growth

Methods

EQRCodeIso15415GradingParameters	-

EQRCodeIso15415GradingParameters.AdditionalParametersGrades

Additional Parameters Grades

Namespace: Euresys.Open_eVision

[C#]

```
Euresys.Open_eVision.EQRCodeAdditionalParametersGrades AdditionalParametersGrades
```

EQRCodeIso15415GradingParameters.AxialNonUniformity

Axial Non Uniformity

Namespace: Euresys.Open_eVision

[C#]

```
float AxialNonUniformity
```

EQRCodeIso15415GradingParameters.AxialNonUniformityGrade

Axial Non Uniformity Grade

Namespace: Euresys.Open_eVision

[C#]

```
int AxialNonUniformityGrade
```

EQRCodeIso15415GradingParameters.DecodingGrade

-

Namespace: Euresys.Open_eVision

[C#]

```
int DecodingGrade
```

EQRCodeIso15415GradingParameters.EQRCodeIso15415GradingParameters

-

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeIso15415GradingParameters(
 )
```

EQRCodeIso15415GradingParameters.FixedPatternDamageGrade

Fixed Pattern Damage Grade

Namespace: Euresys.Open_eVision

[C#]

```
int FixedPatternDamageGrade
```

EQRCodeIso15415GradingParameters.GridNonUniformity

Grid Non Uniformity

Namespace: Euresys.Open_eVision

[C#]

```
float GridNonUniformity
```

EQRCodeIso15415GradingParameters.GridNonUniformityGrade

Grid Non Uniformity Grade

Namespace: Euresys.Open_eVision

[C#]

```
int GridNonUniformityGrade
```

EQRCodeIso15415GradingParameters.HorizontalPrintGrowth

Horizontal Print Growth

Namespace: Euresys.Open_eVision

[C#]

```
float HorizontalPrintGrowth
```

EQRCodeIso15415GradingParameters.ModulationGrade

Modulation Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ModulationGrade
```

EQRCodeIso15415GradingParameters.OverallSymbolGrade

This struct member is deprecated.

Overall Symbol Grade

Namespace: Euresys.Open_eVision

[C#]

```
int OverallSymbolGrade
```

EQRCodeIso15415GradingParameters.ReflectanceMarginGrade

Reflectance Margin Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ReflectanceMarginGrade
```

EQRCodeIso15415GradingParameters.ScanGrade

Scan Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ScanGrade
```

EQRCodeIso15415GradingParameters.SymbolContrast

Symbol Contrast

Namespace: Euresys.Open_eVision

[C#]

```
float SymbolContrast
```

EQRCodeIso15415GradingParameters.SymbolContrastGrade

Symbol Contrast Grade

Namespace: Euresys.Open_eVision

[C#]

```
int SymbolContrastGrade
```

EQRCodeIso15415GradingParameters.UnusedErrorCorrection

Unused Error Correction

Namespace: Euresys.Open_eVision

[C#]

```
float UnusedErrorCorrection
```

EQRCodeIso15415GradingParameters.UnusedErrorCorrectionGrade

Unused Error Correction Grade

Namespace: Euresys.Open_eVision

[C#]

```
int UnusedErrorCorrectionGrade
```

EQRCodeIso15415GradingParameters.VerticalPrintGrowth

Vertical Print Growth

Namespace: Euresys.Open_eVision

[C#]

```
float VerticalPrintGrowth
```

5.40. EQRCodeIso29158CalibrationParameters Struct

Holds all grading inputs pertaining to ISO/IEC 29158

Namespace: Euresys.Open_eVision

Properties

MLcal	Mean of the light from a histogram of the calibrated standard.
Rcal	Reported reflectance value, from a calibration standard.
SRcal	System response parameters(such as exposure and/or again) used to create an image of the calibration standard.
SRtarget	System response parameters(such as exposure and/or again) used to create an image of the symbole under test.

Methods

EQRCodeIso29158CalibrationParameters	-

EQRCodeIso29158CalibrationParameters.EQRCodeIso29158CalibrationParameters

-

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeIso29158CalibrationParameters(
 )
```

EQRCodeIso29158CalibrationParameters.MLcal

Mean of the light from a histogram of the calibrated standard.

Namespace: Euresys.Open_eVision

[C#]

```
float MLcal
```

EQRCodeIso29158CalibrationParameters.Rcal

Reported reflectance value, from a calibration standard.

Namespace: Euresys.Open_eVision

[C#]

```
float Rcal
```

EQRCodeIso29158CalibrationParameters.SRcal

System response parameters(such as exposure and/or again) used to create an image of the calibration standard.

Namespace: Euresys.Open_eVision

[C#]

```
float SRcal
```

EQRCodeIso29158CalibrationParameters.SRtarget

System response parameters(such as exposure and/or again) used to create an image of the symbole under test.

Namespace: Euresys.Open_eVision

[C#]

```
float SRtarget
```

5.41. EQRCodeIso29158GradingParameters Struct

Holds all grading parameters pertaining to ISO/IEC 29158

Namespace: Euresys.Open_eVision

Properties

CellContrastGrade	-
CellModulationGrade	Cell Modulation Grade
FixedPatternDamageGrade	FixedPatternDamageGrade
IsMeanLightInRequiredBounds	Is Mean Light In Required Bounds
MeanLight	Mean Light
MinimumReflectanceGrade	Minimum Reflectance Grade
OverallSymbolGrade	-
ScanGrade	Scan Grade

Methods

EQRCodeIso29158GradingParameters	-

EQRCodeIso29158GradingParameters.CellContrastGrade

-

Namespace: Euresys.Open_eVision

[C#]

```
int CellContrastGrade
```

EQRCodeIso29158GradingParameters.CellModulationGrade

Cell Modulation Grade

Namespace: Euresys.Open_eVision

[C#]

```
int CellModulationGrade
```

EQRCodeIso29158GradingParameters.EQRCodeIso29158GradingParameters

-

Namespace: Euresys.Open_eVision

[C#]

```
void EQRCodeIso29158GradingParameters(
 )
```

EQRCodeIso29158GradingParameters.FixedPatternDamageGrade

FixedPatternDamageGrade

Namespace: Euresys.Open_eVision

[C#]

```
int FixedPatternDamageGrade
```

EQRCodeIso29158GradingParameters.IsMeanLightInRequiredBounds

Is Mean Light In Required Bounds

Namespace: Euresys.Open_eVision

[C#]

```
bool IsMeanLightInRequiredBounds
```

EQRCodeIso29158GradingParameters.MeanLight

Mean Light

Namespace: Euresys.Open_eVision

[C#]

```
float MeanLight
```

EQRCodeIso29158GradingParameters.MinimumReflectanceGrade

Minimum Reflectance Grade

Namespace: Euresys.Open_eVision

[C#]

```
int MinimumReflectanceGrade
```

EQRCodeIso29158GradingParameters.OverallSymbolGrade

-

Namespace: Euresys.Open_eVision

[C#]

```
int OverallSymbolGrade
```

EQRCodeIso29158GradingParameters.ScanGrade

This struct member is deprecated.

Scan Grade

Namespace: Euresys.Open_eVision

[C#]

```
int ScanGrade
```

5.42. ERenderStyle Struct

Represents how to visualize 3D Objects in a E3DViewer

Namespace: Euresys.Open_eVision.Easy3D

Properties

fillRGB	Fill (inside) color of the object
hasFill	Indicates that the inside of the object should be rendered.
hasLine	Indicates that the edges of the object should be rendered

lineRGB	Line (edge) color of the object.
pointRGB	Color of the object if it is a point.

Methods

ERenderStyle	Constructs a default ERenderStyle object.

ERenderStyle.ERenderStyle

Constructs a default ERenderStyle object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
void ERenderStyle(
 )
```

ERenderStyle.fillRGB

Fill (inside) color of the object

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EC24A fillRGB
```

Remarks

Only applied if the object is a polygon.

ERenderStyle.hasFill

Indicates that the inside of the object should be rendered.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool hasFill
```

Remarks

Only applied if the object is a polygon.

ERenderStyle.hasLine

Indicates that the edges of the object should be rendered

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
bool hasLine
```

Remarks

Only applied if the object is a polygon.

ERenderStyle.lineRGB

Line (edge) color of the object.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EC24A lineRGB
```

Remarks

Only applied if the object is a polygon.

ERenderStyle.pointRGB

Color of the object if it is a point.

Namespace: Euresys.Open_eVision.Easy3D

```
[C#]
Euresys.Open_eVision.EC24A pointRGB
```

5.43. ERGB Struct

NTSC/PAL/SMPTE Red, Green, Blue color system.

Namespace: Euresys.Open_eVision

Properties

B	Blue component.
G	Green component.
R	Red component.

ERGB.B

Blue component.

Namespace: Euresys.Open_eVision

[C#]

```
float B
```

ERGB.G

Green component.

Namespace: Euresys.Open_eVision

[C#]

```
float G
```

ERGB.R

Red component.

Namespace: Euresys.Open_eVision

[C#]

```
float R
```

5.44. ERGBColor Struct

NTSC/PAL/SMPTE Red, Green, Blue color system.

Namespace: Euresys.Open_eVision

Properties

Blue	Blue component.
Green	Green component.
Red	Red component.

Methods

ERGBColor	Constructs an ERGBColor object.

ERGBColor.Blue

Blue component.

Namespace: Euresys.Open_eVision

```
[C#]
int Blue
```

ERGBColor.ERGBColor

Constructs an ERGBColor object.

Namespace: Euresys.Open_eVision

```
[C#]
void ERGBColor(
 int red,
 int green,
 int blue
 )
void ERGBColor(
 int hexColor
 )
void ERGBColor(
 )
```

Parameters

red
Red component.

green
Green component.

blue
Blue component.

hexColor
Components defined as a hexadecimal color code (0xRRGGBB)

ERGBColor.Green

Green component.

Namespace: Euresys.Open_eVision

[C#]

```
int Green
```

ERGBColor.Red

Red component.

Namespace: Euresys.Open_eVision

[C#]

```
int Red
```

5.45. EROCPoint Struct

The structure representing a point on the ROC (Receiver Operating Characteristic) curve.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Properties

FP	The False Positive count: it is the number of good image classified as defective.
FPR	The False Positive Rate: it is the number of good image classified as defective, normalized by the number of good images.
N	The Negative count: it is the number of good images.
P	The Positive count: it is the number of defective images.
Threshold	The threshold associated with the true and false positive rates (see EUnsupervisedSegmenter::ClassificationThreshold).
TP	The True Positive count: it is the number of defective images classified as defective.
TPR	The True Positive Rate: it is the number of defective images classified as defective, normalized by the number of defective images. The TPR can be NaN (Not A Number) if the metrics were computed using only good images.

Methods

EROCPoint	Constructs a EROCPoint.
Load	Loads the ROC point. The given ESerializer must have been created for reading.
Save	Saves the ROC point. The given ESerializer must have been created for writing.

EROCPoint.EROCPoint

Constructs a EROCPoint.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
void EROCPoint(
 )
void EROCPoint(
 float threshold,
 int truePositiveCount,
 int positiveCount,
 int falsePositiveCount,
 int negativeCount
 )
```

Parameters

threshold
Threshold corresponding to the ROC point.

truePositiveCount
Number of defective images classified as defective.

positiveCount
Total number of defective images.

falsePositiveCount
Number of good images classified as defective.

negativeCount
Total number of good images.

EROCPoint.FP

The False Positive count: it is the number of good image classified as defective.

Namespace: Euresys.Open_eVision.EasyDeepLearning

```
[C#]
int FP
```

EROCPoint.FPR

The False Positive Rate: it is the number of good image classified as defective, normalized by the number of good images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float FPR
```

EROCPoint.Load

Loads the ROC point. The given ESerializer must have been created for reading.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Load(
 string path
 )
void Load(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EROCPoint.N

The Negative count: it is the number of good images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int N
```

EROCPoint.P

The Positive count: it is the number of defective images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int P
```

EROCPoint.Save

Saves the ROC point. The given ESerializer must have been created for writing.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
void Save(
 string path
 )
void Save(
 Euresys.Open_eVision.ESerializer serializer
 )
```

Parameters

path

The file path.

serializer

The serializer.

EROCPoint.Threshold

The threshold associated with the true and false positive rates (see EUnsupervisedSegmenter::ClassificationThreshold).

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float Threshold
```

EROCPoint.TP

The True Positive count: it is the number of defective images classified as defective.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
int TP
```

EROCPoint.TPR

The True Positive Rate: it is the number of defective images classified as defective, normalized by the number of defective images.
The TPR can be NaN (Not A Number) if the metrics were computed using only good images.

Namespace: Euresys.Open_eVision.EasyDeepLearning

[C#]

```
float TPR
```

5.46. ERun Struct

-

Namespace: Euresys.Open_eVision

Properties

Length	Length of the Run
OrgX	X origin of the Run
Y	Y position of the Run

Methods

ERun	Constructs an ERun context.
operator!=	Checks if this instance is not strictly equal to another
operator==	Checks if this instance is strictly equal to another

ERun.ERun

Constructs an ERun context.

Namespace: Euresys.Open_eVision

[C#]

```
void ERun(
 )

void ERun(
 int orgX,
 int length,
 int y
 )
```

Parameters

orgX
X origin of the Run.

length
Length of the Run.

y
Y position of the Run.

ERun.Length

Length of the Run

Namespace: Euresys.Open_eVision

```
[C#]
int Length
```

ERun.operator!=

Checks if this instance is not strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator!=(
 Euresys.Open_eVision.ERun other
 )
```

Parameters

other

Reference to the other ERun instance

ERun.operator==

Checks if this instance is strictly equal to another

Namespace: Euresys.Open_eVision

```
[C#]
bool operator==(
 Euresys.Open_eVision.ERun other
 )
```

Parameters

other

Reference to the other ERun instance

ERun.OrgX

X origin of the Run

Namespace: Euresys.Open_eVision

[C#]

```
int OrgX
```

ERun.Y

Y position of the Run

Namespace: Euresys.Open_eVision

[C#]

```
int Y
```

5.47. ERunData Struct

This struct is deprecated.

Describes runs.

Remarks

A run is characterized by a starting point (OrgX, OrgY), by a length, a class, a unique identification number and the number of the object to which they belong. After the run construction phase, all the runs are gathered in a single dynamic list.

Namespace: Euresys.Open_eVision

Properties

Class	Class.
Len	Length.
ObjNum	Identification number of the object to which the run belongs.
OrgX	Start point abscissa.
OrgY	Start point ordinate.

ERunData.Class

This struct member is deprecated.

Class.

Namespace: Euresys.Open_eVision

[C#]

```
int Class
```

ERunData.Len

This struct member is deprecated.

Length.

Namespace: Euresys.Open_eVision

```
[C#]
int Len
```

ERunData.ObjNum

This struct member is deprecated.

Identification number of the object to which the run belongs.

Namespace: Euresys.Open_eVision

```
[C#]
int ObjNum
```

ERunData.OrgX

This struct member is deprecated.

Start point abscissa.

Namespace: Euresys.Open_eVision

```
[C#]
int OrgX
```

ERunData.OrgY

This struct member is deprecated.

Start point ordinate.

Namespace: Euresys.Open_eVision

```
[C#]
int OrgY
```

5.48. ESize Struct

-

Namespace: Euresys.Open_eVision

Properties

Height	Height.
Width	Width.

Methods

ESize	Constructs a ESize.
operator!=	Checks if this instance is not strictly equal to another
operator==	Checks if this instance is strictly equal to another

ESize.ESize

Constructs a ESize.

Namespace: Euresys.Open_eVision

```
[C#]
void ESize(
 )
void ESize(
 float width,
 float height
 )
```

Parameters

width
Width.

height
Height.

ESize.Height

Height.

Namespace: Euresys.Open_eVision

[C#]

```
float Height
```

ESize.operator!=

Checks if this instance is not strictly equal to another

Namespace: Euresys.Open_eVision

[C#]

```
bool operator!=(
 Euresys.Open_eVision.ESize other
 )
```

Parameters

other

Reference to the other ESize instance

ESize.operator==

Checks if this instance is strictly equal to another

Namespace: Euresys.Open_eVision

[C#]

```
bool operator==(
 Euresys.Open_eVision.ESize other
 )
```

Parameters

other

Reference to the other ESize instance

ESize.Width

Width.

Namespace: Euresys.Open_eVision

[C#]

```
float Width
```

5.49. EVSH Struct

Value, Saturation, Hue color system.

Namespace: Euresys.Open_eVision

Properties

H	Hue component.
S	Saturation component.
V	Value component.

EVSH.H

Hue component.

Namespace: Euresys.Open_eVision

```
[C#]
float H
```

EVSH.S

Saturation component.

Namespace: Euresys.Open_eVision

```
[C#]
float S
```

EVSH.V

Value component.

Namespace: Euresys.Open_eVision

```
[C#]
float V
```

5.50. EXYZ Struct

CIE XYZ color system.

Namespace: Euresys.Open_eVision

Properties

X	X component.
Y	Y component.
Z	Z component.

EXYZ.X

X component.

Namespace: Euresys.Open_eVision

```
[C#]
float X
```

EXYZ.Y

Y component.

Namespace: Euresys.Open_eVision

```
[C#]
float Y
```

EXYZ.Z

Z component.

Namespace: Euresys.Open_eVision

```
[C#]
float Z
```

5.51. EYIQ Struct

CCIR Luma, Inphase, Quadrature color system.

Namespace: Euresys.Open_eVision

Properties

I	Inphase component.
Q	Quadrature component.
Y	Luma component.

EYIQ.I

Inphase component.

Namespace: Euresys.Open_eVision

```
[C#]
float I
```

EYIQ.Q

Quadrature component.

Namespace: Euresys.Open_eVision

```
[C#]
float Q
```

EYIQ.Y

Luma component.

Namespace: Euresys.Open_eVision

```
[C#]
float Y
```

5.52. EYSH Struct

CCIR Luma, Saturation, Hue color system.

Namespace: Euresys.Open_eVision

Properties

H	Hue component.
S	Saturation component.

Y	Luma component.

EYSH.H

Hue component.

Namespace: Euresys.Open_eVision

```
[C#]
float H
```

EYSH.S

Saturation component.

Namespace: Euresys.Open_eVision

```
[C#]
float S
```

EYSH.Y

Luma component.

Namespace: Euresys.Open_eVision

```
[C#]
float Y
```

5.53. EYUV Struct

CCIR Luma, U Chroma, V Chroma color system.

Namespace: Euresys.Open_eVision

Properties

U	U Chroma component.
V	V Chroma component.
Y	Luma component.

EYUV.U

U Chroma component.

Namespace: Euresys.Open_eVision

```
[C#]
float U
```

EYUV.V

V Chroma component.

Namespace: Euresys.Open_eVision

```
[C#]
float V
```

EYUV.Y

Luma component.

Namespace: Euresys.Open_eVision

```
[C#]
float Y
```

6. Enumerations

6.1. E3DAttribute Enum

This enumeration contains the possible attributes of the EPointCloud in addition to the E3DPoint. The attributes have constraints about the type that is used to represent them. See also E3DAttribute.

Namespace: Euresys.Open_eVision.Easy3D

Color	Represents the color of an E3DPoint, it should use the type EC24A.
Normal	Represents the normal of an E3DPoint, it should use the type E3DPoint.
Intensity	Represents the intensity of an E3DPoint, it should use a numeric type.
Texture	Represents the texture of an E3DPoint, it can use any type.
Index	Represents an index related to an E3DPoint, it should use the type uint32_t or int32_t.
Confidence	Represents the confidence of an E3DPoint, it should use the type float.
Distance	Represents the distance of an E3DPoint to another element, it should use the type float. This attribute can be set by E3DAligner, E3DMatcher, E3DComparer.
Curvature	Represents the local curvature of an E3DPoint, it should use the type float. This attribute can be set by EPointCloud::ComputeNormalsAndCurvatures.

Remarks

Numeric types are: uint8_t, uint16_t, uint32_t, int32_t, float, double.

6.2. E3DObjectFeature Enum

The list of possible extracted features for E3DObject

Namespace: Euresys.Open_eVision.Easy3D

Length	Length of the object in metric units.
Width	Width of the object in metric units.
LocalHeight	Local height of the object in metric units.
ReferenceHeight	Reference height of the object in metric units.
Orientation	Orientation of the object.
BoundingBox	3D oriented bounding box of the object.
AveragePosition	3D average position of the object.
LocalTopPosition	3D highest position of the object relatively to the object base plane.
ReferenceTopPosition	3D top position relative to the ZMap origin (this is the position with the highest Z coordinate).
Plane	Plane fitted to the object 3D positions.
LocalTilt	Angle between the object plane and the base plane.
ReferenceTilt	Angle between the object plane and the vertical (Z) axis.
Area	Object area in metric units.
Volume	Object volume in metric units.
BasePlane	Base plane for the object.

BaseTilt	Angle between the base plane and the vertical (Z) axis.
ERectangleRegion	ERectangleRegion enclosing the object ZMap pixels.
ERegion	ERegion composed of the object ZMap pixels.
Sphere	Sphere fitted on the object

6.3. EAdaptiveThresholdMethod Enum

Adaptive thresholding modes.

Namespace: Euresys.Open_eVision

Mean	Use the mean as threshold.
Median	Use the median as threshold.
Middle	Use the middle of the values interval as threshold.

6.4. EAlignmentPolarity Enum

Polarity of an alignment, used in EFeaturesAligner.

Namespace: Euresys.Open_eVision.Easy3D

ModelToMeasured	The transformation from the model data to the measured data.
MeasuredToModel	The transformation from the measured data to the model data.

6.5. EAngleUnit Enum

The angle units that are supported by Open eVision.

Namespace: Euresys.Open_eVision

Revolutions	Revolutions (0..1 corresponds to a full revolution).
Radians	Radians (0..2Pi corresponds to a full revolution).
Degrees	Degrees (0..360 corresponds to a full revolution).
Grades	Grades (0..400 corresponds to a full revolution).

6.6. EArithmeticLogicOperation Enum

Supported arithmetic or logic pixel-wise operators.

Namespace: Euresys.Open_eVision

Copy	Sheer copy.
Invert	Complement. (*)
Add	Saturated addition. (*)
Subtract	Saturated subtraction. (*)
Multiply	Saturated multiplication. (*)
Divide	Saturated division. (*)
Modulo	Modulo. (*)
ShiftLeft	Arithmetic left shift (multiplication by a power of 2). (*)
ShiftRight	Arithmetic right shift (division by a power of 2). (*)
ScaledAdd	Non saturating addition ((left + right) / 2). (*)
ScaledSubtract	Non saturating subtraction ((left + complemented right) / 2). (*)
ScaledMultiply	Non saturating multiplication (left * right / 256 in the BW8 case, and left * right / 65,536 in the BW16 one). (*)
ScaledDivide	Non saturating division (256 * left / right in the BW8 case, and 65,536 * left / right in the BW16 one). (*)
BitwiseAnd	Bitwise AND.
BitwiseOr	Bitwise OR.
BitwiseXor	Bitwise exclusive OR.
LogicalAnd	Logical AND (non zero is true). (*)
LogicalOr	Logical OR (non zero is true). (*)
LogicalXor	Logical exclusive OR (non zero is true). (*)
Min	Minimum. (*)
Max	Maximum. (*)
SetZero	Copy the right operand where the left operand is zero.
SetNonZero	Copy the right operand where the left operand is non zero.
Equal	Equality comparison. (*)
NotEqual	Non equality comparison. (*)
GreaterOrEqual	"Greater or equal" comparison. (*)
LesserOrEqual	"Lesser or equal" comparison.
Greater	"Greater" comparison. (*)

Lesser	"Lesser" comparison. (*)
Compare	Absolute value of the difference. (*)
Overlay	Overlay of one image onto a source image giving a destination image. (See note at the end of the topic). (*) (**)
BitwiseNot	Same as Invert.
Average	Same as ScaledAdd. (*)

Remarks

(*) Not applicable for the BW1 images/ROIs. (**) In the overlay image, black pixels (0 valued) are considered as transparent. If a C24 image is used as overlay, all pixels (but the black ones) will be copied to the destination image. If a BW8 image is used as overlay, all non-black pixels will be converted to the color defined by the OverlayColor parameter before copy to the destination image. The destination image is always a C24 image. If no source image is given (only overlay and destination), the destination image is considered as the source image.

6.7. EasyOCR2CharacterFilter Enum

This enumeration contains the possible filters for loading fonts in EOCR2.

Namespace: Euresys.Open_eVision

ASCII	All ASCII characters are loaded.
Letters	Only (alphabetic) letters are loaded (both lowercases and uppercases).
Digits	Only digits are loaded.
LowerCaseLetters	Only (alphabetic) lowercase letters are loaded.
UpperCaseLetters	Only (alphabetic) uppercase letters are loaded.

6.8. EasyOCR2CharSpacingBias Enum

This enumeration contains the possible biases for the optimised character spacing in the detection phase of EOCR2.

Namespace: Euresys.Open_eVision

Wide	The optimisation is biased toward wide character spacing.
Neutral	The optimisation is not biased.
Narrow	The optimisation is biased toward narrow character spacing.

6.9. EasyOCR2CharWidthBias Enum

This enumeration contains the possible biases for the optimised character width in the detection phase of EOCR2.

Namespace: Euresys.Open_eVision

Widest	The optimisation is biased toward very wide boxes.
Wide	The optimisation is biased toward wide boxes.
Neutral	The optimisation is not biased.
Narrow	The optimisation is biased toward narrow boxes.
Narrowest	The optimisation is biased toward very narrow boxes.

6.10. EasyOCR2DrawDetectionStyle Enum

This enumeration contains the possible drawing styles for the detection results in EOCR2.

Namespace: Euresys.Open_eVision

DrawChars	A bounding box is drawn around each individual detected character
DrawWords	A bounding box is drawn around each detacted word, containing all characters in the word
DrawLines	A bounding box is drawn around each detacted line, containing all characters/words in the line
DrawText	A bounding box is drawn around the detected text, containing all characters/words/lines in the text

6.11. EasyOCR2DrawRecognitionStyle Enum

This enumeration contains the possible drawing styles for the recognition results in EOCR2.

Namespace: Euresys.Open_eVision

LeftTop	The recognition result is drawn at the left top of the character
LeftMiddle	The recognition result is drawn at the left middle of the character
LeftBottom	The recognition result is drawn at the left bottom of the character
BottomLeft	The recognition result is drawn at the bottom left of the character
BottomMiddle	The recognition result is drawn at the bottom middle of the character
BottomRight	The recognition result is drawn at the bottom right of the character
RightBottom	The recognition result is drawn at the right bottom of the character

RightMiddle	The recognition result is drawn at the right middle of the character
RightTop	The recognition result is drawn at the right top of the character
TopRight	The recognition result is drawn at the top right of the character
TopMiddle	The recognition result is drawn at the top middle of the character
TopLeft	The recognition result is drawn at the top left of the character

6.12. EasyOCR2DrawSegmentationStyle Enum

This enumeration contains the possible drawing styles for the segmentation results in EOCR2.

Namespace: Euresys.Open_eVision

DrawBlobs	The segmented blobs are drawn directly.

6.13. EasyOCR2TextPolarity Enum

This enumeration contains the possible polarities of text searched during segmentation in EOCR2.

Namespace: Euresys.Open_eVision

WhiteOnBlack	The text is light on a dark background
BlackOnWhite	The text is dark on a light background

6.14. EAttributeType Enum

This enumeration contains the possible types for the E3DAttribute. See also EPointCloud::GetAttributeBufferType.

Namespace: Euresys.Open_eVision.Easy3D

UINT8	Corresponds to an uint8_t.
UINT16	Corresponds to an uint16_t.
UINT32	Corresponds to an uint32_t.
INT32	Corresponds to an int32_t.
FLOAT	Corresponds to a float.
DOUBLE	Corresponds to a double.
EC24A	Corresponds to an EC24A.

E3DPOINT	Corresponds to an E3DPoint.
UNDEFINED	Corresponds to a non-defined type.

6.15. EAxisOriginMode Enum

This enumeration contains the possible values for the parameter of E3DViewer::AxisOrigin method.

Namespace: Euresys.Open_eVision.Easy3D

BoundingBoxOrigin	Use the bounding box lower point as axis origin
WorldOrigin	Use the world origin as axis origin
UserDefined	Use a user defined point as axis origin

6.16. EAxisSystemType Enum

-

Namespace: Euresys.Open_eVision.Easy3D

CornerUpperLeft	-
CornerLowerLeft	-
Unknown	-

6.17. EBarCodeSymbologies Enum

-

Namespace: Euresys.Open_eVision.EasyBarCode2

AdsAnker	ADS Anker symbology.
Bc412	Code BC 412 symbology.
Codabar	Codabar symbology.
Code11	Code 11 symbology.
Code13	Code 13 symbology.
Code25Compressed	Code 25 Compressed symbology.
Code25Datalogic	Code 25 DataLogic symbology.
Code25Interleaved	Code 25 Interleaved symbology.

Code25Iata	Code 25 IATA symbology.
Code25Industry	Code 25 Industry symbology.
Code25Inverted	Code 25 Inverted symbology.
Code25Matrix	Code 25 Matrix symbology.
Code39	Code 39 symbology.
Code39Extended	Code 39 Extended symbology.
Code39Reduced	Code 39 Reduced symbology.
Code32	Code 32 symbology.
Code93	Code 93 symbology.
Code93Extended	Code 93 Extended symbology.
Code128	Code 128 symbology.
CodeBcdMatrix	Code BCD Matrix symbology.
CodeCip	Code CIP symbology.
Ean8	EAN 8 symbology.
Ean13	EAN 13 symbology.
Gs1_128	GS1 128 symbology.
IbmDeltaDistanceA	IBM Delta Distance A symbology.
Msi	MSI symbology.
Plessey	Plessey symbology.
Gs1DataBarOmnidirectional	GS1 DataBar Omnidirectional symbology. As we do not analyze the height of the detected barcodes at the moment, GS1 DataBar Truncated codes will be detected as omnidirectional ones.
Gs1DataBarLimited	GS1 DataBar Limited symbology.
Gs1DataBarExpanded	GS1 DataBar Expanded symbology.
Rss14	RSS-14 symbology. Present for backward-compatibility, replaced by Gs1DataBarOmnidirectional.
Rss14Limited	RSS-14 Limited symbology. Present for backward-compatibility, replaced by Gs1DataBarLimited.
Rss14Expanded	RSS-14 Expanded symbology. Present for backward-compatibility, replaced by Gs1DataBarExpanded.
Telepen	Telepen symbology.
UpcA	UPC-A symbology.
UpcE	UPC-E symbology.
CodeStk	Code STK symbology.
PharmacodeOneTrack	Pharmacode with one track symbology.
BinaryCode	Binary Code symbology.

6.18. EBayerConfiguration Enum

The Bayer image color configuration of the first two pixels.

Namespace: Euresys.Open_eVision

RG	The Bayer image starts with Red-Green pixels
GR	The Bayer image starts with Green-Red pixels
BG	The Bayer image starts with Blue-Green pixels
GB	The Bayer image starts with Green-Blue pixels

6.19. EByteInterpretationMode Enum

This enumeration contains the available modes to interpret bytes values of a decoded string.

Namespace: Euresys.Open_eVision

Hexadecimal	Bytes will be converted to hexadecimal values surrounded by an escape character: "0xEFBFBD.
UTF8	Bytes will be converted to UTF-8.
Auto	Bytes are converted to UTF-8 or their supported ECI table if possible. They will be converted to hexadecimal with escape character otherwise.

Remarks

Hexadecimal: each byte is encoded with its corresponding two characters hexadecimal value. This mode does not throw exceptions. This mode overrides the byte encoding dictated by the ECI supported tables.
If the conversion required by the selected mode is not feasible, an exception is thrown.
The Auto will not generate exceptions if the ECI table is not supported or if the conversion is not feasible in UTF-8.

6.20. ECalibrationMode Enum

Allowed values for the calibration mode.

Namespace: Euresys.Open_eVision

Raw	No calibration at all.
Inverse	The ordinate axis points downwards instead of upwards.
Scaled	The pixels are assigned a physical size.

Anisotropic	The physical size of the pixels differ horizontally and vertically. (Beware there is a restriction pertaining to the allowed image anisotropy. The resulting pixels aspect ratio should be in the range [-4/3, -3/4] (or [3/4, 4/3]), otherwise the calibration process could fail).
Skewed	The coordinate axis make an angle with the image edge.
Tilted	The field-of-view plane is not perpendicular to the optical axis.
Radial	The lens introduces some amount of radial distortion.
Bilinear	This mode can not be combined with other calibration mode. The bilinear calibration is based on a first order polynomial approach.
Quadratic	This mode can not be combined with other calibration mode. The quadratic calibration is based on a second order polynomial approach.

6.21. ECalibrationType Enum

The Easy3D calibration type.

Namespace: Euresys.Open_eVision.Easy3D

Scale	Calibration type is EScaleCalibrationModel.
ExplicitGeometric	Calibration type is EExplicitGeometricCalibrationModel.
ObjectBased	Calibration type is EObjectBasedCalibrationModel.
Unknown	Calibration type is not defined.

6.22. ECannyThresholdingMode Enum

The thresholding modes for the Canny edge detector.

Namespace: Euresys.Open_eVision

Relative	Relative thresholding mode.
Absolute	Absolute thresholding mode.

6.23. ECC000Family Enum

-

Namespace: Euresys.Open_eVision.EasyMatrixCode2

ECC000	-

ECC050	-
ECC080	-
ECC100	-
ECC140	-
Unknown	-

6.24. ECellColor Enum

Allowed values for a cell color (Black or White).

Namespace: Euresys.Open_eVision

Black	Black, the cell is dark with respect to the background.
White	White, the cell is light with respect to the background.

6.25. EClassifierCapacity Enum

The capacity of the classifier network.
A larger capacity means that the underlying neural network is capable of learning more information but it will be slower. Also a lower capacity allow for a smaller minimal height and width of input.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Small	Small capacity.
Normal	Normal capacity.
Large	Large capacity.
Onnx	Onnx classifier capacity.

6.26. EClippingMode Enum

Allows to choose how the fitted segment length and centre are computed

Namespace: Euresys.Open_eVision

CenteredNominal	Regular mode: the fitted segment always has the nominal length of the line gauge.
ClippedToValidSamples	The fitted segment does not extend beyond valid samples. It is clipped to the projection of the valid samples on the fitted line.

ClippedInNominalShape	The segment is built by clipping the fitted line in the rectangular range where the ELineGauge looks for valid transition samples, i.e. the rectangle which is centered and aligned on the ELineGauge nominal line, and which height is two times the ELineGauge::Tolerance.

6.27. ECodeType Enum

-

Namespace: Euresys.Open_eVision

MatrixCode	-
QRCode	-
BarCode	-
Unknown	-

6.28. EColorQuantization Enum

Allowed values for the quantization mode in EasyColor.

Namespace: Euresys.Open_eVision

FullRange	Values are quantized in range 0..255.
Ccir601	Values are quantized in range 16..235 for the R, G, B or Y component, and in range 16..240 for the I, Q, U and y components.

Remarks

When quantizing the color values for the RGB or YIQ/YUV representation, one usually uses the full 0..255 range. Anyway, the CCIR has defined an alternate convention such that some values in this interval are reserved. Before performing a conversion, functions EasyColor::SrcQuantization and EasyColor::DstQuantization can be used to specify the rule used.

6.29. EColorRampMode Enum

This enumeration contains the possible values for the parameter of E3DViewer::GenerateColors method.

Namespace: Euresys.Open_eVision.Easy3D

HueFromZ	The Hue color component calculated from Z coordinate. The colors range from Blue (minimum Z) to Red (maximum Z).

HueFromY	The Hue color component calculated from Y coordinate. The colors range from Blue (minimum Y) to Red (maximum Y).
HueFromX	The Hue color component calculated from X coordinate. The colors range from Blue (minimum X) to Red (maximum X).
HueFastFromZ	The Hue color component with fast change calculated from Z coordinate. The colors range from Red (minimum Z) to Red (maximum Z) going through green and blue.
HueFastFromY	The Hue color component with fast change calculated from Y coordinate. The colors range from Red (minimum Y) to Red (maximum Y) going through green and blue.
HueFastFromX	The Hue color component with fast change calculated from X coordinate. The colors range from Red (minimum X) to Red (maximum X) going through green and blue.
RGBCube	RGB colors directly calculated from XYZ coordinates.
HueFromIntensity	The colors used are calculated from the intensity attribute of EPointCloud.
HueFromConfidence	The colors used are calculated from the confidence attribute of EPointCloud.
HueFromDistance	The colors used are calculated from the distance attribute of EPointCloud.
HueFromNormal	The colors used are calculated from the normal attribute of EPointCloud. A normal of (1, 0, 0) is converted to (255, 0, 0), one of (0, 1, 0) to (0, 255, 0) and one of (0, 0, 1) to (0, 0, 255).
Undefined	The color ramp is not defined. This is the value used when there is no color and all E3DPoint will be displayed in white.

6.30. EColorSystem Enum

The color systems that are supported by Open eVision.

Namespace: Euresys.Open_eVision

NoColor	Undefined
Bilevel	Binary black & white.
GrayLevel	Continuous tone black & white.
Xyz	CIE XYZ.
Rgb	NTSC/PAL/SMPTE Red, Green, Blue.
Lab	CIE Lightness, a*, b*.
Luv	CIE Lightness, u*, v*.
Yuv	CCIR Luma, U Chroma, V Chroma.

Yiq	CCIR Luma, Inphase, Quadrature.
Lch	Lightness, Chroma, Hue.
Ish	Intensity, Saturation, Hue
Lsh	Lightness, Saturation, Hue.
Vsh	Value, Saturation, Hue.
Ysh	CCIR Luma, Saturation, Hue.

Remarks

Open eVision supports several color systems. The achromatic ones are related to black and white and gray-level images (EImageBW1 and EImageBW8). The remaining ones apply to color images (EImageC24). Also see unquantized and quantized colors for the allowed ranges of values.

6.31. EComparisonDistanceMode Enum

This enumeration specifies the distance mode for the 3D comparison. See E3DMatcher::ComparisonDistanceMode and E3DComparer::ComparisonDistanceMode.

Namespace: Euresys.Open_eVision.Easy3D

Fast	Same as Euclidean_Fast, kept for backward compatibility for E3DMatcher.
Normal	Same as Euclidean, kept for backward compatibility for E3DMatcher.
Advanced	Same as Euclidean_Advanced, kept for backward compatibility for E3DMatcher.
Euclidean_Fast	An algorithm faster but less accurate than Euclidean (especially on edges). Not compatible with E3DComparer.
Euclidean	The default algorithm.
Euclidean_Advanced	A more advanced algorithm used to penalize bumps but with increased computation time. Not compatible with E3DComparer.
Normals	Works like Euclidean with the exception that the distances are not computed from points but from their normals. As a consequence, the distance threshold set by E3DMatcher::SetAnomalyThresholds or E3DComparer::SetAnomalyThresholds must be expressed in Easy::AngleUnit.
Normals_Advanced	A more advanced algorithm based on normals distances. This is more robust towards false positives near edges than Normals. This setting ignores the values set by E3DMatcher::AllComparisonNoExtraMaterial, E3DComparer::NoExtraMaterial and E3DMatcher::EnableMissingPointAsAnomaly (missing points are not detected). When using this option, the distance threshold set by E3DMatcher::SetAnomalyThresholds or E3DComparer::SetAnomalyThresholds must be expressed in Easy::AngleUnit.

6.32. EConfusionMatrixElement Enum

The various elements representing the cases of the 2x2 confusion matrix used in EConfusionMatrixElement.

Namespace: Euresys.Open_eVision.EasyDeepLearning

CorrectlyClassifiedGoodSample	A CorrectlyClassifiedGoodSample is a good images classified as good. It is also called a true negative.
BadlyClassifiedGoodSample	A BadlyClassifiedGoodSample is a good images classified as defective. It is also called a false positive.
CorrectlyClassifiedDefectiveSample	A CorrectlyClassifiedDefectiveSample is a defective images classified as defective. It is also called a true positive.
BadlyClassifiedDefectiveSample	A BadlyClassifiedDefectiveSample is a good images classified as good. It is also called a false negative.

6.33. EConnexity Enum

Possible values for the connexity of a contour.

Namespace: Euresys.Open_eVision

Connexity4	Pixels touching by an edge are considered connected.
Connexity8	Pixels touching by an edge or a corner are considered connected.

6.34. EContourMode Enum

Possible modes for contour traversal.

Namespace: Euresys.Open_eVision

Clockwise	The contour is traversed clockwise.
ClockwiseAlwaysClosed	The contour is traversed clockwise and the image border may be followed if necessary to close the contour.
ClockwiseContinueIfBorder	Contour traversal is restarted counterclockwise when an image border is met.
Anticlockwise	The contour is traversed counterclockwise.
AnticlockwiseContinueIfBorder	Contour traversal is restarted clockwise when an image border is met.
AnticlockwiseAlwaysClosed	The contour is traversed anticlockwise and the image border may be followed if necessary to close the contour.

6.35. EContourThreshold Enum

Allowed thresholding modes for contour traversal.

Namespace: Euresys.Open_eVision

Above	Traverse the pixels just above the threshold.
Below	Traverse the pixels just below the threshold.

6.36. ECorrelationMode Enum

Allowed values for the EasyMatch correlation mode.

Namespace: Euresys.Open_eVision

Standard	Correlation sensitive to changes in intensity and/or contrast (computed from the raw image/pattern gray values).
OffsetNormalized	Correlation made unsensitive to changes in intensity (computed from the centered image/pattern gray values).
GainNormalized	Correlation made unsensitive to changes in contrast (computed from the reduced image/pattern gray values).
Normalized	Correlation made unsensitive to changes in both intensity and contrast (computed from the centered and reduced image/pattern gray values). Default mode.

6.37. EDatasetType Enum

Type of dataset split.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Training	Training dataset (images used to train the model).
Validation	Validation dataset (images used to select the model ith the best performance during training).
Test	Test dataset (images not used during training).
All	Training, validaton, or test dataset.

6.38. EDataSize Enum

Possible data sizes for an object feature.

Namespace: Euresys.Open_eVision

BitsPerPixel1	bit
BitsPerPixel8	byte
BitsPerPixel16	word
BitsPerPixel32	long word
BitsPerPixel64	quad word
BitsPerPixel24	3 bytes
BitsPerPixel96	12 bytes

6.39. EDataType Enum

Possible data types for an object feature.

Namespace: Euresys.Open_eVision

UnsignedInt	Unsigned integer.
SignedInt	Signed integer.
Float	Floating-point.

6.40. EDeepLearningDeviceType Enum

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

CPU	-
GPU	-
Other	-
NotADevice	-

6.41. EDeepLearningInferencePrecision Enum

Precisions supported by a Deep Learning device.

Namespace: Euresys.Open_eVision.EasyDeepLearning

INT8	-
FLOAT16	-

FLOAT32	-

6.42. EDeepLearningToolType Enum

-

Namespace: Euresys.Open_eVision.EasyDeepLearning

None	-
EasyClassify	-
EasySegmentUnsupervised	-
EasySegmentSupervised	-
EasyLocate	-
EasyLocateInterestPoint	-

6.43. EDLDataAugmentationType Enum

EDLDataAugmentationType represents how the data augmentation transformation are generated.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Random	Random transformation between the lower and upper limits
LowerLimit	Transformation using the lower limits.
UpperLimit	Transformation using the upper limits.

6.44. EDongleType Enum

Dongle types.

Namespace: Euresys.Open_eVision

Legacy	Legacy Dongle
Neo	Neo Dongle
Unknown	All Dongles

6.45. EDoubleThresholdMode Enum

The double threshold mode for the selection of coded elements with respect to a given feature.

Namespace: Euresys.Open_eVision

Inside	The value of the feature must be greater or equal to the low threshold, and strictly less than the high threshold.
Outside	The value of the feature must be strictly less than the low threshold, or greater or equal to the high threshold.

6.46. EDraggingMode Enum

Defines how the shape could be dragged

Namespace: Euresys.Open_eVision

Standard	Allows positioning the shape edges symmetrically.
ToEdges	Allows positioning each shape edge individually.

6.47. EDragHandle Enum

Allowed values for a handle identifier in the context of handle dragging.

Namespace: Euresys.Open_eVision

NoHandle	No handle.
Inside	Inside handle.
North	Northern handle.
East	Eastern handle.
South	Southern handle.
West	Western handle.
NorthWest	North-Western handle.
SouthWest	South-Western handle.
NorthEast	North-Eastern handle.
SouthEast	South-Eastern handle.
Center	Circle, rectangle or wedge center handle.
Org	Line segment or circle arc origin handle.

Mid	Line segment or circle arc middle handle.
End	Line segment or circle arc end handle.
Tol0	First tolerance handle.
Tol1	Second tolerance handle.
Tol_x0	Rectangle leftmost first tolerance handle.
Tol_x1	Rectangle leftmost second tolerance handle.
Tol_y0	Rectangle lower first tolerance handle.
Tol_y1	Rectangle lower second tolerance handle.
Tol_XX0	Rectangle rightmost first tolerance handle.
Tol_XX1	Rectangle rightmost second tolerance handle.
Tol_YY0	Rectangle upper first tolerance handle.
Tol_YY1	Rectangle upper second tolerance handle.
Vertex	Polygon vertex handle.
Tol_a0	Wedge leftmost first tolerance handle.
Tol_a1	Wedge leftmost second tolerance handle.
Tol_AA0	Wedge rightmost first tolerance handle.
Tol_AA1	Wedge rightmost second tolerance handle.
Tol_r0	Wedge inner first tolerance handle.
Tol_r1	Wedge inner second tolerance handle.
Tol_RR0	Wedge outer first tolerance handle.
Tol_RR1	Wedge outer second tolerance handle.
Edge_x	Rectangle leftmost edge handle.
Edge_XX	Rectangle rightmost edge handle.
Edge_y	Rectangle lower edge handle.
Edge_YY	Rectangle upper edge handle.
Edge_a	Wedge leftmost edge handle.
Edge_AA	Wedge rightmost edge handle.
Edge_r	Wedge outer edge handle.
Edge_RR	Wedge inner edge handle.

6.48. EDrawableFeature Enum

The various features that can be drawn for coded elements.

Namespace: Euresys.Open_eVision

BoundingBox	The bounding box.
ConvexHull	The convex hull.
Ellipse	The ellipse of inertia.
FeretBox22	The Feret box oriented at 22.5 degrees.
FeretBox45	The Feret box oriented at 45 degrees.
FeretBox68	The Feret box oriented at 67.5 degrees.
GravityCenter	The gravity center.
MinimumEnclosingRectangle	The minimum enclosing rectangle.
FeretBox	The Feret box oriented at a fixed angle. Only available for selections of coded elements: The angle of interest is set through the EObjectSelection::FeretAngle property.
WeightedGravityCenter	The gravity center of the pixels of the attached image over the coded element. Only available for selections of coded elements: The attached image is set through the EObjectSelection::AttachedImage property.
Contour	The contour of the object.

6.49. EDrawingMode Enum

Allowed modes to draw the bounding box of a symbol.

Namespace: Euresys.Open_eVision

Nominal	Draws the nominal point location or model fitting gauge.
Actual	Draws the located point or the fitted model.
SampledPaths	Draws the sampled segments along the model.
SampledPath	Draws the sampled segment specified by ELineGauge::MeasureSample.
PointsInSkipRange	Draws the skipped sampled points in addition to the non-skipped points.
SampledPoints	Draws the sampled points along the model.
SampledPoint	Draws the sampled point specified by ELineGauge::MeasureSample.
InvalidSampledPoints	Draws the invalid sampled points along the model.
Learn	Draw the pattern learning ROI(s).
Match	Draw the pattern searching ROI(s).
Position	Draw the found pattern ROI(s).
Inspected	Draw the inspected ROI.
MaxInspected	Draw the largest possible inspected ROI.

6.50. EEditionMode Enum

This enumeration is used to select which graphical interactions are allowed.

Namespace: Euresys.Open_eVision

None	The object cannot be edited.
Move	The object can be moved.
Rotate	The object can be rotated.
Stretch	The object can be stretched.
EdgeSplit	The object can have one of its edges split.
All	All graphical interactions are allowed.

6.51. EEncodingConnexity Enum

The connexity mode for the encoding process.

Namespace: Euresys.Open_eVision

Four	Pixels touching by an edge are considered connected.
Eight	Pixels touching by an edge or a corner are considered connected.

6.52. EError Enum

Possible Open eVision error codes.

Namespace: Euresys.Open_eVision

Ok	Success
EndOfImageSequence	End of image sequence
UserDialogFailed	User dialog failed
ImageLimitsReached	Image limits reached
InvalidAsciiPadding	Invalid ASCII padding
InvalidOperation	Invalid operation - See Reference
InvalidBitsPerPixel	Invalid depth (bits per pixel) - Check type compatibility
InvalidDataType	Invalid data type - Check type compatibility
InvalidDataSize	Invalid data size - Check type compatibility
ParametersOutOfRange	Parameters out of range - See Reference

InvalidMode	Invalid mode - See Reference
EndSmallerThanStart	End smaller than start - Adjust indices
Parameter1OutOfRange	Parameter 1 out of range - See Reference
Parameter2OutOfRange	Parameter 2 out of range - See Reference
Parameter3OutOfRange	Parameter 3 out of range - See Reference
Parameter4OutOfRange	Parameter 4 out of range - See Reference
Parameter5OutOfRange	Parameter 5 out of range - See Reference
Parameter6OutOfRange	Parameter 6 out of range - See Reference
Parameter7OutOfRange	Parameter 7 out of range - See Reference
Parameter8OutOfRange	Parameter 8 out of range - See Reference
Parameter9OutOfRange	Parameter 9 out of range - See Reference
Parameter10OutOfRange	Parameter 10 out of range - See Reference
WindowsError	Out of GDI handles
InvalidPlanesPerPixel	Invalid planes per pixel - Check image type or file contents
BW1ImageExpected	1 bit black & white (BW1) image expected - Check image type or file contents
BW8ImageExpected	8 bits black & white (BW8) image expected - Check image type or file contents
BW16ImageExpected	16 bits black & white (BW16) image expected - Check image type or file contents
BW32ImageExpected	32 bits black & white (BW32) image expected - Check image type or file contents
TemplateCallNeedsSpecialization	Template call needs specialization
CannotCreateMutex	Cannot create Mutex
CannotLockMutex	Cannot lock Mutex
CannotUnlockMutex	Cannot unlock Mutex
CannotDeleteMutex	Cannot delete Mutex
TimeoutReached	Timeout reached
FunctionNotFound	Function not found
ProcessStopped	Process stopped
CopyNotAllowed	Copy not allowed
SingularMatrix	Internal error (code: 1050)
DivisionByZero	Division by zero - Check parameters
ReadonlyProperty	This property is read-only and cannot be accessed
UndefinedProperty	This property is undefined and cannot be accessed

ItemNotFound	The data structure does not contain the specified item
NextItemNotFound	The specified item has no next sibling
ZeroDimension	Width and height must be different from zero.
StringConvertionFailed	String convertion failed.
FileAccessProblems	File access problems - Check file pathname and device state
FileCouldNotBeOpened	File could not be opened - Check file pathname, troubleshoot disk device
FilwhileReading	File error while reading - Check file integrity, troubleshoot disk device
FilwhileWriting	File error while writing - Check free disk space, troubleshoot disk device
BadFileFormat	Bad file format - Check file source or contents
FileCouldNotBeClosed	File could not be closed - Check free disk space, troubleshoot disk device
UnsupportedFileFormatVersion	Unsupported file format version - Upgrade to newer release
MissingOrUnsupportedFileExtension	Missing or unsupported file extension - Check file name/format match
FileIsReadOnly	File is read-only - Set to read-write or save under another name
UnsupportedObjectTypeInArchive	The archive does not contain the correct object type - Check your archiving routines
UnknownArchiveError	An unexpected error occurred during archive access
SerializerShouldBeInReadMode	Attempting to read with a serializer not open for read access
SerializerShouldBeInWriteMode	Attempting to write with a serializer not open for write access
FileExists	Attempting to overwrite an existing file while not allowed to do so
SerializerNotOpen	Attempting to use a serializer that is not correctly opened
UnrecognizedFileFormat	Unrecognized File Format
WrongColorFormatFileFormatCombination	Wrong Color Format File Format Combination
FileDoesNotExist	Attempting to open a file which doesn't exist
ObjectTooLargeToBeSerialized	Object is too large to be serialized
UnsupportedFileFormat	Unsupported File Format
ResourcesDirectoryNotFound	Resources directory doesn't exist or cannot be opened.
ResourceFileNotFound	Resource doesn't exist or cannot be opened.

UnsupportedTiffFormat	Unsupported TIFF format - Convert TIFF file
UnsupportedBmpFormat	Unsupported BMP format - Convert BMP file
InvalidPngCompression	Invalid PNG compression level
UnsupportedJpegFormat	Unsupported JPEG format - Convert JPEG file
BilevelImageExpected	Bi-level image expected - Use BW1
GrayLevelImageExpected	Gray-level image expected - Use BW8
ColorImageExpected	Color image expected - Use C24
BilevelFormatExpected	Bi-level format expected - Convert file to black & white
GrayLevelFormatExpected	Gray-level format expected - Convert file to gray shades
ColorFormatExpected	Color format expected - Convert file to true color
CannotReadJpegFile	Cannot read JPEG file - Troubleshoot disk device
CannotWriteJpegFile	Cannot write JPEG file - Troubleshoot disk device
WrongFileExtension	Wrong file extension
UnableToAllocateTemporaryMemory	Unable to allocate temporary memory - Fix memory leaks or release memory
BufferTooSmall	The supplied buffer is too small. Supply a bigger buffer.
UnableToAllocateMemory	Not enough memory for this allocation.
UnableToAccessImageMemory	Unable to access image memory - Load or size image
RoiTooLarge	ROI too large - Fit ROI to image
NotAValidImage	Not a valid image - Check image contents
ImagesNotSameSize	Images not of the same size - Adjust image size(s)
ImagesNotSameBitsPerPixel	Images not of the same depth (bits per pixel) - Choose compatible types
SourceImageTooSmall	Origin image too small - Use a larger image
PixelsMustHaveFiniteSize	Pixels must have finite size - Use non-zero parameters
ConstantIsNull	Constant is NULL - Use non-zero value
PixelNullEncountered	NULL pixel encountered - Avoid division by zero
ImagesMayNotOverlap	Images cannot overlap - Use distinct images
RoiOutOfImageLimits	ROI out of the top parent limits - Resize to fit in image
RoiAlreadyHasAParent	ROI already has a parent - Detach ROI first

RoiHasNoParentImage	There is no image ancestor for this ROI - Attach the ROI or one of its ancestor to an image
CannotApplyToAnImage	Cannot apply to an image - Apply to a ROI instead
UnsupportedImageType	Unsupported image type - Check type compatibility
InvalidImageType	Invalid image type - Check type compatibility
UnsupportedXserverDepth	Unsupported X server depth
InconsistentRoiHierarchy	The hierarchy of ROI has been corrupted (inconsistent parent/daughters relationship)
SourceImageTooBig	Original image too big - Use a smaller image
BW1RoiNotAligned	First bit index of an aligned ROI must be 0 - Use an aligned ROI
WrongRoiType	Wrong ROI or image type
CyclingParenthoodNotAllowed	Cycling Parenthood not allowed
WrongBitsPerRow	Bits per row must be a multiple of 32 (4 bytes) and must be enough to hold all the pixels of an image row.
MisalignedImagePtr	The supplied image pointer must be aligned to 4 bytes.
UnsupportedImageTypeConversion	Unsupported image type conversion
ImageFromFileDoesNotFitIntoROI	The ROI is not the same size as the image file. When loading an image from a file into a ROI, the ROI must have the exact required size. On the other, when loading into an image object, it gets resized to the correct size.
PixelCoordinatesOutOfROI	The specified coordinate is outside the ROI/Image
ROIFromFileDoesNotFitIntoROI	The ROI is not the same size as the ROI previsously saved. ROIs directly linked to an pixel container must have the same size as the container and have a (0, 0) origin.
ROIHasZeroArea	The ROI width and height must both be larger than 0 - resize the ROI.
RegionTooSmall	The region is too small.
ERegionHasNotBeenPrepared	The ERegion has not been prepared, please use function ERegion::Prepare().
ERegionImpossibleCopy	Cannot copy non-prepared geometrical region into a base ERegion instance.
CanvasSizeNotSet	Canvas size not set.
RegionOutsideImageOrRoi	ERegion is (partially) outside of the corresponding image/ROI
PixelOutsidePerimeter	Pixel outside perimeter - Check pixel value
PixelInsidePerimeter	Pixel inside perimeter - Check pixel value

IsolatedPixel	Isolated pixel - Check pixel value
MaxPixelInContourReached	Maximum pixels in contour reached
NotAValidContour	Not a valid contour - Initialize using a contouring function
UnableToAccessVectorMemory	Unable to access vector memory - Check proper vector initialization
NotAValidVectorDescriptor	Not a valid vector descriptor
VectorTypeIsNotHist	Vector type is not histogram
NotEnoughGroupsInVector	Not enough groups in vector
InvalidVectorDataSize	Invalid vector data size
InvalidVectorDataType	Invalid vector data type
InvalidVectorType	Invalid vector type
ResultTooBigToFitInVector	Result too big to fit in vector
GroupOutOfRange	Group out of range - Adjust group index
InvalidVectorGroupLength	Invalid vector group length
InvalidNumberOfVectorElements	Invalid number of vector elements - Check proper vector initialization
VectorsNotSameSize	Vectors not of the same size - Adjust vector size(s)
UnableToAccessKernelMemory	Unable to access kernel memory - Check proper kernel initialization
NotAValidKernelDescriptor	Not a valid kernel descriptor
InvalidKernel	Invalid kernel
KernelInvalidSize	Invalid kernel size - Check proper kernel initialization
KernelNotAllocated	Kernel not allocated - Check proper kernel initialization
BadListPosition	Bad list position - Restart list traversal
ListIsEmpty	List is empty
TopOfList	Top of list - Do not traverse backwards
BotOfList	Bottom of list - Do not traverse forwards
ListError	List error
LicenseMissing	The license for this library is not granted - Launch License Manager
EasyImageLicenseMissing	The license for EasyImage is not granted - Launch License Manager
EasyColorLicenseMissing	The license for EasyColor is not granted - Launch License Manager

EasyObjectLicenseMissing	The license for EasyObject is not granted - Launch License Manager
EasyMatchLicenseMissing	The license for EasyMatch is not granted - Launch License Manager
EasyGaugeLicenseMissing	The license for EasyGauge is not granted - Launch License Manager
EasyFindLicenseMissing	The license for EasyFind is not granted - Launch License Manager
EasyOcrLicenseMissing	The license for EasyOCR is not granted - Launch License Manager
EasyOcvLicenseMissing	The license for EasyOCV is not granted - Launch License Manager
EasyBarCodeLicenseMissing	The license for EasyBarCode is not granted - Launch License Manager
EasyMatrixCodeLicenseMissing	The license for EasyMatrixCode is not granted - Launch License Manager
EasyMatchAlignementModeLicenseMissing	The license for EasyMatch Alignment mode is not granted - Launch License Manager
EvisionStudioLicenseMissing	The license for eVison Studio is not granted - Launch License Manager
InvalidDongleIndex	The index do not match any available dongle
CannotWriteOEMKey	The OEM key cannot be set
OEMKeyIndexNotSupported	key Indexes are not supported by the selected DongleType
OEMKeyInvalidSize	The size of the OEM key is invalid, it should be between 8 and 64 chars
OEMKeyInvalidIndex	The index of the OEM key is invalid, it should be between 0 and 11
NoGradingComputed	This EBarCode was not graded
WarpImagesTooSmall	Warp images too small - Increase image size
UnsupportedImageSize	Unknown error code
InvalidThresholdValue	The threshold value is not supported
ImagesSizeIncompatible	The sizes of the images parameters is not compatible.
UnknownFeature	Unknown feature - Check parameters
InvalidSelectionArgument	Invalid selection argument - Check parameters
SortListTooLong	Sort list too long
NotAValidOperationCode	Not a valid operation code
TooManyObjectsDetected	Too many objects detected - Increase MaxObjects
InvalidFeature	Invalid feature - Check parameters
FeatureNotCalculated	Feature not calculated - Call AnalyseObjects method

BadObjectNumber	Bad object number - Check parameters
NoObjectSelected	No object selected - Blob list is empty
LowThresholdHigherThanHighThreshold	Low threshold higher than high threshold - Adjust thresholds
InvalidThresholdMode	Invalid threshold mode - Use appropriate threshold setting method
NoImageAttached	No image attached to the selection - Use Attach()
OutOfContinuousMode	Invalid call out of continuous mode
InvalidImageTypeForSegmenter	The current segmenter can not cope with this type of image
LayersOverlapping	Two different layers are associated with the same layer index
EndOfIterator	The iterator has reached the end of the enumeration
NoThresholdComputedYet	The threshold valued has not been computed yet - First encode an image
FeatureNotDrawable	This kind of feature cannot be drawn
OnlyApplicableToObjectSelection	This kind of feature cannot be used out of EObjectSelection
MoreThanOneLayerEncoded	Please specify the layer index (several layers are encoded)
CodedElementNotSelected	The coded element is not present in the selection
NoPatternLearnt	No pattern learnt - Load from file or train pattern
PatternTooLarge	Pattern too large - Use a smaller one
PatternTooSmall	Pattern too small - Use a larger one
NotAnEasyMatchFile	Not an EasyMatch file - Check file source
UnsupportedEasyMatchFileVersion	Unsupported EasyMatch file version - Upgrade to a newer release
NoImageLearnt	No image learnt - Call LearnImage() first
WrongNumberOfDegresOfFreedom	The number of degrees of freedom must be at least one, and no more than five - Use a value in this range
InsufficientDiscriminantFeaturesInPattern	There is not enough discriminant features in the selected region to learn a pattern
Unknown_Pattern_Style	The pattern style is not recognized
GrabCutNoImageSpecified	No image was specified to the GrabCut algorihtm. Set an image with SetImage().
GrabcutNotEnoughSamples	There is not enough background and/or foreground pixels to build a model and apply the GrabCut algorithm.
InsufficientContrast	Not enough feature points - Use a more contrasted pattern or reduce the Don't Care mask

PatternTooCloseToImageBorder	Pattern is too close to image border - Leave a margin around the pattern
IncompatibleModes	Incompatible modes (CoarseToFineAnalysisMode and PatternType)
AllowancesAndPatterntypeNotCompatible	Angle and Scale allowances can not be used with the current pattern type
ModelNotSuitedForContrastingregions	The model is unsuitable for ContrastingRegions pattern type - Try an other pattern type or increase surface of region(s)
ModelNotSuitedForConsistentedges	The model is unsuitable for ConsistentEdges pattern type - Try another pattern type or increase the model surface
OnlyConsistentedgesForVectorLearning	Learning using a vector model is only possible with the ConsistentEdges pattern type - Try ConsistentEdges pattern type
LoadedPatternCallsForContrastingRegions	The loaded pattern calls for Contrasting Regions pattern type, but Contrasting Regions pattern type is deprecated since Open eVision 23.08.
NoPatternsLoaded	No patterns loaded - Load font file or train
NoPatternsInTheseClasses	No patterns in these classes - Check pattern and text class assignments
CharacterTooSmall	Character too small - Enlarge to font size
CharacterCodeTooBig8	Character code too big to fit in a string, use ReadTextWide instead
CharacterCodeTooBig16	Character code too big to fit in a wide string, use GetFirstCharCode instead
InvalidTextStructure	Text parameter doesn't fit the text topology
InvalidFontFile	The specified font file couldn't be loaded
InvalidTopology	The specified topology is invalid
InvalidEOCR2File	The file-type and structure could not be verified
EOCR2InvalidCharWidth	Character widths must be larger than 0
EOCR2InvalidCharWidthTolerance	Character width tolerance must be between 0 and 1
EOCR2InvalidCharHeight	Character height must be larger than 0
EOCR2InvalidMaxVariation	The 'maximum variation' parameter must be between 0 and 1.
EOCR2InvalidDetectionDelta	The 'detection delta' parameter must be between 0 and 128.
EOCR2InvalidMaxFragmentation	The 'maximum fragmentation' parameter must be between 0 and 1.
EOCR2InvalidSpaceWidth	Space widths must be larger than or equal to 0.
EOCR2InvalidNumDetectionPasses	NumDetectionPasses must be either 1 or 2.

EOCR2CharCodeNotSet	Character code not set
EOCR2CharHeightNotSet	Character height not set
EOCR2CharWidthNotSet	Character width not set
EOCR2TopologyNotSet	Topology not set
EOCR2RangedTopologyNotSupported	Ranged topology is not supported with this method of detection.
EOCR2InvalidRelativeSpaceWidth	Relative space width must be larger than 0
EOCR2ClassiferNotFound	OCR2 Pre-trained classifier not found.
EOCR2ClassiferInvalid	OCR2 Pre-trained classifier is valid.
EOCR2TopologyNotSupported	OCR2 Topology not supported by the deep-learning classifier
EOCR2DetectionFailed	The given topology and parameters could not be fitted to the detected blobs.
MismatchingColorSystem	Mismatching color system - Check transform compatibility
ColorLookupMustBeInitialized	Color lookup must be initialized - Use initialization method
UnsupportedColorTransform	Unsupported color transform
UnknownSymbolSize	Unknown symbol size - Check size initialization
UnknownEccFamily	Unknown ECC family (ECC 000/050/080/100/140/200 only)
UncorrectableErrors	Too many errors, cannot correct contents - See Reference
CouldNotLocateSymbol	Could not locate the dot matrix symbol (no good candidate object) - See Reference
UnknownFormatId	Unknown Format ID in ECC 000-140 symbol (Base 11/27/41/37 and ASCII 7/8 only) - See Reference
InvalidCrc	Invalid CRC after error correction in ECC 000-140 symbol - See Reference
NoCodeFound	Could not find any codes in the image
TimeoutReachedAndNoCodeFound	Could not find any codes in the image within the timeout
CouldNotDecodeSymbol	Could not decode symbol - Try to improve image quality
CouldNotGrade	Could not grade symbol - Quiet zone out of bounds
CouldNotLocateBarcode	Could not locate bar code symbol - Improve contrast, avoid clutter

UnrecognizedSignature	Unrecognized signature - Check enabled symbologies
InvalidNumberOfBars	Invalid number of bars - Improve bar/space contrast
ExtraEdgesFound	Extra edges found - Improve bar/space contrast or uniformity
IncoherentBarSpaceThickness	Incoherent bar/space thickness sequence - Check enabled symbologies
InvalidCheckCharacter	Invalid checksum character - Check enabled symbologies
SymbologyNotEnabled	Symbology not enabled - Invoke method SetSymbologies()
NoEdgesFound	No edges found - Adjust location or improve bar/space contrast
InvalidEMailBarcodeReaderFile	The file-type and structure could not be verified
InvalidGS1String	The given string could not be parsed as a GS1 machine readable string
NotAnEasyOcvFile	Not an EasyOCV file - Check file source
UnsupportedEasyOcvFileVersion	Unsupported EasyOCV file version - Upgrade Open eVision
NotEnoughSampleImages	Not enough sample images - Use AddToStatistics
NotAnEcheckerFile	Not an EChecker file - Check file source
UnsupportedEcheckerFileVersion	Unsupported EChecker file version - Upgrade Open eVision
NotEnoughSamplesLearnt	Not enough samples learnt - Use UpdateStatistics
InvalidNormalizationMode	Invalid normalization mode - Check SetNormalize call
ImageNotRegistered	Image not registered - Use method Register before Learn
InvalidLearningSequence	Invalid learning sequence - Use AVERAGE followed by ABS_DEVIATION, or RMS_DEVIATION, then READY
E_ERROR_CONTRAST_TOO_LOW	Image contrast is too low
MotherAlreadyHasThisDaughter	Mother already has this daughter - Detach daughter first
ShapeAlreadyHasDaughters	Shape already has daughters - Detach daughters first
NoValidPointFound	No valid point found in the transition computation.
NotInListAttachmentMode	Not in list attachment mode - Detach daughters first
NotInIndexedAttachmentMode	Not in indexed attachment mode - Detach daughters and call SetIndexed first
UnsupportedShapeVersion	Unsupported shape version - Upgrade Open eVision
RawCalibrationMode	Raw calibration mode - Cannot be used for this operation

BadLandmarkLayout	The layout of supplied landmarks makes the calibration impossible - Check landmarks positions
IncompatibleCalibrationModes	Incompatible calibration modes - Check calibration mode categories
NotEnoughLandmarks	Not enough landmarks to calibrate - Add landmarks or check calibration mode categories
UnexpectedShapeTypeInFile	Unexpected shape type in file - Check target shape against file model root
UnsupportedModelFileVersion	Unsupported model file version - Upgrade Open eVision
CannotAttachDetachWorldShapes	Cannot Attach or Detach World shape - World shapes never have a mother
UnexpectedWorldShapeInFile	Unexpected World Shape in file - Check target shape against file model root
UnexpectedFrameShapeInFile	Unexpected Frame Shape in file - Check target shape against file model root
UnexpectedPointShapeInFile	Unexpected Point Shape in file - Check target shape against file model root
UnexpectedLineShapeInFile	Unexpected Line Shape in file - Check target shape against file model root
UnexpectedCircleShapeInFile	Unexpected Circle Shape in file - Check target shape against file model root
UnexpectedRectangleShapeInFile	Unexpected Rectangle Shape in file - Check target shape against file model root
UnexpectedWedgeShapeInFile	Unexpected Wedge Shape in file - Check target shape against file model root
UnexpectedPointGaugeInFile	Unexpected Point Gauge in file - Check target shape against file model root
UnexpectedLineGaugeInFile	Unexpected Line Gauge in file - Check target shape against file model root
UnexpectedCircleGaugeInFile	Unexpected Circle Gauge in file - Check target shape against file model root
UnexpectedRectangleGaugeInFile	Unexpected Rectangle Gauge in file - Check target shape against file model root
UnexpectedWedgeGaugeInFile	Unexpected Wedge Gauge in file - Check target shape against file model root
UnexpectedPolygonGaugeInFile	Unexpected Polygon Gauge in file - Check target shape against file model root
UnexpectedBarCodeInFile	Unexpected Bar Code model in file - Check target shape against file model root
AnActiveCurvedEdgeIsRequired	At least one curved edge must be active - Activate r and/or R edges

BrokenWedgeShapeConstraints	Constraints between the geometric and the tolerance of the wedge are broken
NotEnoughVertices	The polygon is missing one or several vertices to be valid.
InvalidGrid	The detected grid is invalid
InvalidSymbolSize	The detected symbol size is invalid
InvalidFixedPattern	The fixed pattern of the detected code is invalid
LearnInvalidImageSize	The dimensions of the images should be the same after a learn.
InvalidDimensionRangeLearned	No valid datamatrices dimensions have been learned.
QRECIByteInterpretationTableNotSupported	The byte interpretation is dictated by the ECI coding mode.
QRByteEncodingUnknownInterpretationMode	The byte interpretation is dictated by the ECI coding mode.
QRByteInterpretationModeParameterNotCompatibleWithContent	The byte interpretation is dictated by the ECI coding mode.
CalibrationModelNotDefined	A 3D calibration model is required to perform the conversion
InvalidE3DModelFile	The file-type and structure could not be verified
EmptyPointCloud	The point cloud should not be empty
WrongOrientationVector	The supplied orientation vector is not correct
InvalidE3DCalibrationGeneratorFile	The file-type and structure could not be verified
CalibrationModelNotInitialized	A 3D calibration model is not Initialized
InvalidE3DConverterFile	The file-type and structure of the E3D converter file could not be verified
InvalidE3DCalibrationFile	The file-type and structure of the E3D calibration file could not be verified
UnknownCalibrationObjectType	The calibration object type is not set
ResultOutOfTolerances	Result out of tolerances
MalformedTriangleIndexes	The triangle indexes are not correct in E3DObject
FitFailed	The 3D fit operation failed
ParamNotSet	Trying to get a parameter value that has not been set
UndefinedPixelValue	The pixel has undefined value
FindFailed	The 3D find operation failed
AlignFailed	The 3D align operation failed

WrongCalibrationParameters	Wrong calibration parameters
WrongNormalVector	Wrong normal vector
WrongNormalTolerance	Wrong normal angle tolerance
CalibrationModelNotFound	A 3D calibration model is not found
AxesNotNormal	The axis system is not normed
AxesNotRightHanded	The axis system is not righthanded
AxesNotOrthogonal	The axis system is not orthogonal
MatrixNotRigid	A matrix is not rigid
AxisSystemNotRigid	An axis system is not rigid
CoordinatesOutOfMap	The coordinates are out of the map
InvalidAxisSystem	Axis system is invalid
InvalidPointCloud	The point cloud is not valid
PointCloudOutOfRange	The point cloud is out of range
DepthMapNotCompatibleWithCalibration	The depth map point is not compatible with the calibration model (wrong association)
InvalidE3DObjectFile	The file-type and structure of the E3D object file could not be verified
Map3DConversionModeMustBeInitialized	Conversion mode must be initialized
InvalidE3DBoxFile	The file-type and structure of the E3DBox file could not be verified
NoE3DPointFound	No 3D point found.
OutOffSpacePartition	The point or the index is not in the range of space partition.
NoIntersectionFound	No intersection found.
AttributeBufferNotInitialized	The attribute buffer is not initialized.
IncompatibleAttributeTypeConversion	The attribute type can not be converted to the destination type.
PhotometricStereoImagerNotInitialized	The PhotometricStereoImager is not initialized.
SphereDetectionFailed	The sphere detection failed
InvalidLightDirections	The light directions given or deduced from calibration are coplanar. Photometric stereo cannot be performed with such lights.
PhotometricStereoImagerNoComputationDone	The PhotometricStereoImager has not done any computation on new images since last calibration.
PhotometricStereoImagerLightingCorrectionNotConfigured	The non uniform lightning correction must be configured before being enabled.

PhotometricStereoImagerLightingCorrectionBadImageSize	The flat images size must be the same as the object image size.
SphereOutsideOfROI	The sphere is outside of the ROI
E3DViewerNotInitialized	The 3D viewer is not initialized
E3DMatchNoReferenceModel	E3DMatch class was not provided a reference model
E3DMatchEmptyModel	E3DMatch class was provided an empty model
E3DMatchMatchFailed	E3DMatch class could not find a match
EEmptyZMap	EZMap provided does not contain any defined pixel
E3DMatchNoReferencePose	E3DMatch class was not provided a reference pose
InvalidEColorRampMode	The EColorRampMode is not valid with an attribute buffer id.
E3DMatchNoReferencePlane	E3DMatch class was not provided a reference plane
IncompatibleAttribute	The attribute type can not be used for the operation.
E3DMatchNoDistanceComputed	There is no distance computed.
RenderSourceNameUnknown	The render source name is unknown
RenderSourceAlreadyExists	The render source name already exists
EPointCloudMergerCalibrationFailed	EPointCloudMerger's calibration failed
EPointCloudMergerCalibrationModelNotFound	EPointCloudMerger calibration model's file not found
E3DViewerPickingCallBackException	An exception occurred while calling the callback function after having picked a point.
ColorRampFixBoundSDisabled	The fix bounds cannot be retrieved from the color ramp because it is disabled.
E3DPointCloudInvalidSegment	The given line segment is invalid, for example, because the start and end points are the same.
ESphereFitterNotEnoughPointsSupplied	ESphereFitter does not have enough points to generate a sphere
ESphereFitterAllPointsCoplanar	ESphereFitter does not have enough points to generate a sphere
FeatureNotComputed	The requested feature has not been computed.
RadiusShouldBePositive	The radius of a E3DSphere cannot be negative.

ESphereFitterCouldNotFit	The radius of the fitted sphere is negative.
NoColorRampForShapes	Color ramp cannot be used as source color mode for primitives such as boxes, planes and spheres.
OpenGLError	OpenGL Error.
E3DMatchModelTooCoarse	The model given to the E3DMatch class does not contain enough points for it to work properly, try with a denser model.
OpenGLInitError	Failed to initialize OpenGL. Your platform is not able to use the class E3DViewer.
OpenGLESNotSupported	E3DViewer doesn't support OpenGL ES.
DataAugmentationFailed	Data augmentation failed for an unknown reason.
InvalidInputSpecification	Invalid input specification.
LabelDoesNotExist	The label does not exist in the dataset.
ImageIsNotAPath	The image was not given as a path.
ImageDoesNotConformToInputFormat	The images do not conform to the input format of the deep learning tool.
CannotDisableAutoreshape	The automatic procedure to make every image conform to the input specification cannot be disabled because there already are images in the dataset that do not conform to the input specification.
NotEnoughImagesToSplitDataset	There are not enough images in the dataset to perform a split such that each part has at least one image from each label of the original dataset.
NotAvailableIn32Bits	This method is not available for the 32 bits binaries of Open eVision.
DatasetIncompatibleWithDeepLearningTool	The dataset is incompatible with this deep learning tool. A trained tool can add constraints on some of the properties of the tool.
DeepLearningToolCurrentlyTraining	This operation is impossible because this deep learning tool is currently training.
DeepLearningToolNotTraining	Cannot wait because this deep learning tool is not training.
CannotChangeInputSpecification	A pre-trained classifier comes with some input specifications that can't be changed.
TrainingAndValidationDatasetIncompatible	The training and validation dataset have incompatible image format.
TrainingAndValidationLabelsIncompatible	The training and validation dataset have incompatible labels.
ClassifierTrainedWithIncompatibleLabels	The classifier was previously trained with incompatible labels.
CannotChangeClassifierType	The type of classifier can't be changed once the classifier is trained.

UnknownClassifierType	Unknown classifier type.
DeepLearningToolNotTrained	This deep learning tool is not trained.
NoGPUFound	No GPU was found.
InvalidMetrics	The metrics are not valid.
MetricsIncompatibleWithResult	The metrics are incompatible with the given result.
InvalidResult	The classification result is invalid.
HeatmapGenerationFailure	Can not generate Heatmap.
NotEnoughMemoryForTraining	There is not enough free memory on the CPU or GPU to perform the training.
NotEnoughMemoryForPrediction	There is not enough free memory on the CPU or GPU to perform a prediction.
NotEnoughMemoryForBatchPrediction	There is not enough free memory on the CPU or GPU to perform a batch prediction.
LayerOutputDisabled	The layer has its output disabled.
NotEnoughMemoryForCache	There is not enough free memory on the CPU for storing the dataset images in the cache.
DeepLearningToolTrained	This operation is impossible because this deep learning tool is already trained.
DeepLearningToolCannotStartTraining	There was an error while starting the training thread.
LabelAlreadyExists	The label already exists in the dataset.
LabelCannotBeChangedOrRemoved	The label can't be changed or removed from the dataset.
IncompatibleLabels	The labels are not compatible with each other.
InvalidLabelWeight	The label weight is invalid. It must be bigger than 0.
ImageHasNoSegmentation	The image has no segmentation.
ImageHasNoLabel	The image has no classification label.
ResultHasNoGroundtruth	The result doesn't have any groundtruth associated with it.
DeepLearningModelError	There was an error in the deep learning model.
ImageNotLabelledForObjectDetection	The image is not labelled for object detection (see ELocator).
InvalidLocatorObject	The locator object is invalid (no label or empty region).
RectangleRegionNotAxisAligned	The rectangle region is not axis aligned.

CapacityNotAvailable	The rectangle region is not axis aligned.
NoInferenceModel	No inference model is present in the tool.
NoTrainingModel	No training model is present in the tool.
PretrainedModelError	Pretrained model could not be loaded.
HeatmapNotAvailable	The heatmap is not available.
UndefinedDeepLearningProject	The deep learning project is undefined. Cannot save or load.
DeepLearningProjectDirectoryError	Directory doesn't exist or cannot be created.
IncompatibleDeepLearningToolType	The tool type is not compatible with the operation.
DatasetTypeLocked	The dataset type for this image is locked.
CannotChangeLayerParameter	This parameter of the layer cannot be changed once the layer is initialized.
LocatorObjectHasNoSize	The locator object has no size.
CannotSetAnchorsForEasyLocateInterestPoint	TCannot manually set anchors the EasyLocate Interest Point.
LocatorObjectHasNoPosition	The locator object has no position.
CannotParseOnnxFile	This onnx file cannot be parsed.
OnnxModelDoesNotHaveGraph	This onnx model does not have a graph.
OnnxModelIsNotAClassifier	This onnx model is not a classifier.
OnnxModelDoesNotTakeOneInput	This onnx model does not take one input.
OnnxModelAttributeNotDefined	A mandatory attribute is not defined.
OnnxOperatorNotSupported	This onnx model is using an unsupported operator.
OnnxLastLayerIsNotSoftmax	The last layer of the model is not a softmax.
OnnxNumlabelsUndefined	The number of labels is undefined.
OnnxUnknownArgument	Unknown argument
ModelNotFound	The specified neural network model was not found.
CudaError	An error occurred in a NVIDIA CUDA library.

DeepLearningEngineError	An error occurred when executing the model with a Deep Learning engine.
InferenceError	There was an unknown error during inference (e.g. not enough memory).
AlignmentFailed	Alignment failed, please check AlignmentArea and AlignmentTolerance.
InvalidESpotDetectorFile	The file-type and structure of the spot detector file could not be verified.
InvalidESpotFile	The file-type and structure of the spot file could not be verified.
DLClassifierNotSet	The Deep Learning classifier is not set.
PixelHandling	Internal error during image processing
EmptyMorphologicalKernel	Use of a morphological kernel without any element set
MatrixOperation	Internal error during matrix processing
NonSquareMatrix	The operation is only valid for square matrices
IncompatibleMatrixSizes	The sizes of the matrix are incompatible for the operation
UnderdeterminedMatrix	Unsupported operation: The matrix has less rows than columns
OverdeterminedMatrix	Unsupported operation: The matrix has more rows than columns
PointAtInfinity	Unable to apply this operation to points at infinity
NotEnoughCalibrationPoints	Not enough points for the calibration process to succeed
LineAtInfinity	Unable to apply this operation to lines at infinity
UndeterminedGeometricEntity	Undetermined geometric entity in projective geometry
NotANumber	Not a number
MetadataAlreadyExists	Metadata already exists in the metadata store
MetadataDoesNotExist	Metadata does not exist in the metadata store
NotUTF8Compatible	The source is not UTF-8 compatible.
InvalidTrainingMode	The chosen training mode is invalid.
InvalidState	"The object is not in the correct state."
FiducialNotFound	"One of the fiducials has not been found."
InvalidModelFile	"Invalid Model File."
InternalError_000	Internal error 0
InternalError_001	Internal error 1
InternalError_002	Internal error 2
InternalError_003	Internal error 3

InternalError_004	Internal error 4
InternalError_005	Internal error 5
InternalError_006	Internal error 6
InternalError_007	Internal error 7
InternalError_008	Internal error 8
InternalError_009	Internal error 9
InternalError_010	Internal error 10
InternalError_011	Internal error 11
InternalError_012	Internal error 12
InternalError_013	Internal error 13
InternalError_014	Internal error 14
InternalError_015	Internal error 15
InternalError_016	Internal error 16
InternalError_017	Internal error 17
InternalError_018	Internal error 18
InternalError_019	Internal error 19
InternalError_020	Internal error 20
InternalError_021	Internal error 21
InternalError_022	Internal error 22
InternalError_023	Internal error 23
InternalError_024	Internal error 24
InternalError_025	Internal error 25
InternalError_026	Internal error 26
InternalError_027	Internal error 27
InternalError_028	Internal error 28
InternalError_029	Internal error 29
InternalError_030	Internal error 30
InternalError_031	Internal error 31
InternalError_032	Internal error 32
InternalError_033	Internal error 33
InternalError_034	Internal error 34
InternalError_035	Internal error 35
InternalError_036	Internal error 36
InternalError_037	Internal error 37
InternalError_038	Internal error 38

InternalError_039	Internal error 39
InternalError_040	Internal error 40
InternalError_041	Internal error 41
InternalError_042	Internal error 42
InternalError_043	Internal error 43
InternalError_044	Internal error 44
InternalError_045	Internal error 45
InternalError_046	Internal error 46
InternalError_047	Internal error 47
InternalError_048	Internal error 48
InternalError_049	Internal error 49
InternalError_050	Internal error 50
InternalError_051	Internal error 51
InternalError_052	Internal error 52
InternalError_053	Internal error 53
InternalError_054	Internal error 54
InternalError_055	Internal error 55
InternalError_056	Internal error 56
InternalError_057	Internal error 57
InternalError_058	Internal error 58
InternalError_059	Internal error 59
InternalError_060	Internal error 60
InternalError_061	Internal error 61
InternalError_062	Internal error 62
InternalError_063	Internal error 63
InternalError_064	Internal error 64
InternalError_065	Internal error 65
InternalError_066	Internal error 66
InternalError_067	Internal error 67
InternalError_068	Internal error 68
InternalError_069	Internal error 69
InternalError_070	Internal error 70
InternalError_071	Internal error 71
InternalError_072	Internal error 72
InternalError_073	Internal error 73

InternalError_074	Internal error 74
InternalError_075	Internal error 75
InternalError_076	Internal error 76
InternalError_077	Internal error 77
InternalError_078	Internal error 78
InternalError_079	Internal error 79
InternalError_080	Internal error 80
InternalError_081	Internal error 81
InternalError_082	Internal error 82
InternalError_083	Internal error 83
InternalError_084	Internal error 84
InternalError_085	Internal error 85
InternalError_086	Internal error 86
InternalError_087	Internal error 87
InternalError_088	Internal error 88
InternalError_089	Internal error 89
InternalError_090	Internal error 90
InternalError_091	Internal error 91
InternalError_092	Internal error 92
InternalError_093	Internal error 93
InternalError_094	Internal error 94
InternalError_095	Internal error 95
InternalError_096	Internal error 96
InternalError_097	Internal error 97
InternalError_098	Internal error 98
InternalError_099	Internal error 99
InternalError_100	Internal error 100
CannotTraceErrors	Cannot trace errors because of a system failure
NotImplemented	Feature not implemented
NullPointer	The supplied pointer is NULL
InvalidTimeout	The current timeout value is 0
InvalidTimeoutReentrancy	Cannot Stop a timeout that has not been started. Cannot Pop a timeout that has not been pushed
InvalidTimeoutState	Cannot Start a timeout that has been reached Cannot Pop a timeout that is Active

SharedLibraryLoadingError	Error during load of Open eVision shared library
SharedLibraryFunctionLoadingError	Error during load of a function in the Open eVision shared library
RegistryLookup	Error during load of Open eVision shared library
LibraryHashFailed	Error indicating incompatibility between the current wrapper and the targeted library
Unknown	Unknown error

6.53. EFamily Enum

This enum is deprecated.

Allowed values for the ECC symbol family in EasyMatrixCode.

Namespace: Euresys.Open_eVision

ECC000	ECC 000, no error recovery capability by convolutional coding.
ECC050	ECC 050, 2.8 % error recovery capability by convolutional coding.
ECC080	ECC 080, 5.5 % error recovery capability by convolutional coding.
ECC100	ECC 100, 12.6 % error recovery capability by convolutional coding.
ECC140	ECC 140, 25 % error recovery capability by convolutional coding.
ECC200	ECC 200, 20 % error recovery capability.
Unknown	-

Remarks

6.54. EFeature Enum

The various features that can be measured on the coded elements of a selection.

Namespace: Euresys.Open_eVision

ElementIndex	Index of the coded element (cf. ECodedElement::ElementIndex).
LayerIndex	Index of the layer of the coded element (cf. ECodedElement::LayerIndex).
RunCount	Number of runs (cf. ECodedElement::RunCount).
Area	Number of pixels (cf. ECodedElement::Area).
LargestRun	Length of the largest run (cf. ECodedElement::LargestRun).

ContourX	Starting point abscissa of the contour of the coded element (cf. ECodedElement::ContourX).
ContourY	Starting point ordinate of the countour of the coded element (cf. ECodedElement::ContourY).
LeftLimit	Abscissa of the leftmost pixel (cf. ECodedElement::LeftLimit).
RightLimit	Abscissa of the rightmost pixel (cf. ECodedElement::RightLimit).
TopLimit	Abscissa of the topmost pixel (cf. ECodedElement::TopLimit).
BottomLimit	Ordinate of the bottommost pixel (cf. ECodedElement::BottomLimit).
GravityCenterX	Abscissa of the gravity center (cf. ECodedElement::GravityCenterX).
GravityCenterY	Ordinate of the gravity center (cf. ECodedElement::GravityCenterY).
BoundingBoxCenterX	Abscissa of the center of the bounding box (cf. ECodedElement::BoundingBoxCenterX).
BoundingBoxCenterY	Ordinate of the center of the bounding box (cf. ECodedElement::BoundingBoxCenterY).
BoundingBoxWidth	Width of the bounding box (Feret diameter 0 degrees - cf. ECodedElement::BoundingBoxWidth).
BoundingBoxHeight	Height of the bounding box (Feret diameter 90 degrees - cf. ECodedElement::BoundingBoxHeight).
FeretBox22CenterX	Abscissa of the center of the Feret box oriented at 22.5 degrees (cf. ECodedElement::FeretBox22CenterX).
FeretBox22CenterY	Ordinate of the center of the Feret box oriented at 22.5 degrees (cf. ECodedElement::FeretBox22CenterY).
FeretBox22Width	Width of the Feret box oriented at 22.5 degrees (Feret diameter at 22.5 degrees - cf. ECodedElement::FeretBox22Width).
FeretBox22Height	Height of the Feret box oriented at 22.5 degrees (Feret diameter at 112.5 degrees - cf. ECodedElement::FeretBox22Height).
FeretBox45CenterX	Abscissa of the center of the Feret box oriented at 45 degrees (cf. ECodedElement::FeretBox45CenterX).
FeretBox45CenterY	Ordinate of the center of the Feret box oriented at 45 degrees (cf. ECodedElement::FeretBox45CenterY).
FeretBox45Width	Width of the Feret box oriented at 45 degrees bounding box (Feret diameter at 45 degrees - cf. ECodedElement::FeretBox45Width).
FeretBox45Height	Height of the Feret box oriented at 45 degrees (Feret diameter at 135 degrees - cf. ECodedElement::FeretBox45Height).
FeretBox68CenterX	Abscissa of the center of the Feret box oriented at 67.5 degrees (cf. ECodedElement::FeretBox68CenterX).
FeretBox68CenterY	Ordinate of the center of the Feret box oriented at 67.5 degrees (cf. ECodedElement::FeretBox68CenterY).
FeretBox68Width	Width of the Feret box oriented at 67.5 degrees (Feret diameter at 67.5 degrees - cf. ECodedElement::FeretBox68Width).

FeretBox68Height	Height of the Feret box oriented at 67.5 degrees (Feret diameter at 157.5 degrees - cf. ECodedElement::FeretBox68Height).
MinimumEnclosingRectangleCenterX	Abscissa of the Minimum Enclosing Rectangle center (cf. ECodedElement::MinimumEnclosingRectangleCenterX).
MinimumEnclosingRectangleCenterY	Ordinate of the Minimum Enclosing Rectangle center (cf. ECodedElement::MinimumEnclosingRectangleCenterY).
MinimumEnclosingRectangleWidth	Width of the Minimum Enclosing Rectangle (cf. ECodedElement::MinimumEnclosingRectangleWidth).
MinimumEnclosingRectangleHeight	Height of the Minimum Enclosing Rectangle (cf. ECodedElement::MinimumEnclosingRectangleHeight).
MinimumEnclosingRectangleAngle	Direction of the Minimum Enclosing Rectangle (cf. ECodedElement::MinimumEnclosingRectangleAngle).
SigmaX	Centered moment of inertia around X (average squared X-deviation - cf. ECodedElement::SigmaX).
SigmaY	Centered moment of inertia around Y (average squared Y-deviation - cf. ECodedElement::SigmaY).
SigmaXX	Reduced, centered moment of inertia (around the principal inertia axis - cf. ECodedElement::SigmaXX).
SigmaXY	Centered cross moment of inertia (average X-deviation * Y-deviation - cf. ECodedElement::SigmaXY).
SigmaYY	Reduced, centered moment of inertia (around the secondary inertia axis - cf. ECodedElement::SigmaYY).
EllipseWidth	Long axis of the ellipse of inertia (cf. ECodedElement::EllipseWidth).
EllipseHeight	Short axis of the ellipse of inertia (cf. ECodedElement::EllipseHeight).
EllipseAngle	Angle of the principal axis of the ellipse of inertia (cf. ECodedElement::EllipseAngle).
Eccentricity	Eccentricity of the ellipse of inertia (cf. ECodedElement::Eccentricity).
FeretBoxCenterX	Abscissa of the center of the Feret box oriented at a fixed angle (cf. ECodedElement::ComputeFeretBox). The angle of interest is set through EObjectSelection::FeretAngle.
FeretBoxCenterY	Ordinate of the center of the Feret box oriented at a fixed angle (cf. ECodedElement::ComputeFeretBox). The angle of interest is set through EObjectSelection::FeretAngle.
FeretBoxWidth	Width of the Feret box oriented at a fixed angle (cf. ECodedElement::ComputeFeretBox). The angle of interest is set through EObjectSelection::FeretAngle.
FeretBoxHeight	Height of the Feret box oriented at a fixed angle (cf. ECodedElement::ComputeFeretBox). The angle of interest is set through EObjectSelection::FeretAngle.
PixelMin	Minimum gray level of the pixels of the attached image over the coded element (cf. ECodedElement::ComputePixelMin). The attached image is set through EObjectSelection::AttachedImage.

PixelMax	Maximum gray level of the pixels of the attached image over the coded element (cf. ECodedElement::ComputePixelMax). The attached image is set through EObjectSelection::AttachedImage.
WeightedGravityCenterX	Abscissa of the gravity center of the pixels of the attached image over the coded element (cf. ECodedElement::ComputeWeightedGravityCenter). The attached image is set through EObjectSelection::AttachedImage.
WeightedGravityCenterY	Ordinate of the gravity center of the pixels of the attached image over the coded element (cf. ECodedElement::ComputeWeightedGravityCenter). The attached image is set through EObjectSelection::AttachedImage.
PixelGrayAverage	Average gray-level value of the attached image over the coded element (cf. ECodedElement::ComputePixelGrayAverage). The attached image is set through EObjectSelection::AttachedImage.
PixelGrayVariance	Variance of the gray-level value of the attached image over the coded element (cf. ECodedElement::ComputePixelGrayVariance). The attached image is set through EObjectSelection::AttachedImage.
PixelGrayDeviation	Standard deviation of the gray-level value of the attached image over the coded element (cf. ECodedElement::ComputePixelGrayDeviation). The attached image is set through EObjectSelection::AttachedImage.

6.55. EFiducialMatchingMode Enum

Allowed values for the fiducial finder mode in EChecker.

Namespace: Euresys.Open_eVision

Geometric	Geometric finder. Use this mode if the fiducials are well defined and/or may be subject to occlusion.
Area	Area finder. Use this mode if the fiducials are not well defined (have poor edges) or are of inconsistent size.

6.56. EFillUndefinedPixelsDirection Enum

Direction in which the undefined pixels are filled in a depthmap.

Namespace: Euresys.Open_eVision.Easy3D

Vertical	Undefined pixels are filled using a vertical scan.
Horizontal	Undefined pixels are filled using an horizontal scan.
Combined	Undefined pixels are filled using both a vertical and an horizontal scan.

Local	Specialized method for filling undefined pixels. Undefined pixels are filled using their 4 neighboring pixels: If at least 2 out of 4 neighbors have a 'defined' value, the pixel will be filled with their average value. Else, the pixel will remain 'undefined'.

6.57. EFillUndefinedPixelsMethod Enum

Method to fill the undefined pixels in a depthmap.

Namespace: Euresys.Open_eVision.Easy3D

KeepMinimum	Undefined pixels are filled using the minimum of their neighbors.
KeepMaximum	Undefined pixels are filled using the maximum of their neighbors.
Average	Undefined pixels are filled using the average of their neighbors.
Ramp	Undefined pixels are filled using a ramp between their neighbors.

6.58. EFilteringMode Enum

Allowed values for the filtering mode of EasyMatch.

Namespace: Euresys.Open_eVision

Uniform	Filtering with a uniform 2x2 kernel. This is the preferred mode for natural images. Default mode.
LowPass	Filtering with a low-pass 3x3 kernel. This is the preferred mode for images featuring sharp gray-level transitions.

6.59. EFindContrastMode Enum

Allowed values for the contrast mode of EasyFind.

Namespace: Euresys.Open_eVision

Normal	Accepts instances with normal contrast (default mode).
Inverse	Accepts instances with reversed contrast.
Any	Accepts instances with normal and/or reversed contrast.
PointByPointNormal	Accepts instances with normal contrast. Computes pattern score based on a point by point score.
PointByPointInverse	Accepts instances with reversed contrast. Computes pattern score based on a point by point score.

PointByPointAny	Accepts instances with normal and/or reversed contrast. Computes pattern score based on a point by point score.
Unknown	-

6.60. EFlipAxis Enum

Axis for flipping

Namespace: Euresys.Open_eVision

EFlip_Horinzontal_Axis	-
EFlip_Vertical_Axis	-
EFlip_Both_Axis	-

6.61. EFlipping Enum

This enum is deprecated.

Allowed values for the symbol flipping type in EasyMatrixCode.

Namespace: Euresys.Open_eVision

Yes	Image is flipped.
No	Image is not flipped.
Unknown	To be determined at Read or Learn time.

6.62. EFontStyle Enum

Font style.

Namespace: Euresys.Open_eVision

Regular	-
Bold	-
Italic	-
BoldItalic	-
Underline	-
Strikeout	-

Remarks

The values EFontStyle_Underline and EFontStyle_Strikeout are deprecated because they are not usable with the EGenericDrawAdapter.

6.63. EFramePosition Enum

This enumeration contains the possible values for the placement of the overlay frame edges that are drawn to highlight the position of an ROI.

Namespace: Euresys.Open_eVision

On	The frame is centered on the ROI edges.
Inside	The outer edges of the frame remain totally inside the ROI.
Outside	The inner edges of the frame remain totally outside the ROI.

6.64. EFrequentialDomainFormat Enum

This enumeration represents the supported data formats for frequential domain images. See EFourierTransformer.

Namespace: Euresys.Open_eVision

Packed	Packed format, also called Complex Conjugate Symmetrical. This format takes benefit of the Symmetrical nature of the frequential domain to reduce output size to be the same as input size.
ComplexExtended	Extended Complex Format. The output image width is twice the input image width (height is the same). Each Odd Column represents the imaginary part of a complex number.

6.65. EGrayscaleSingleThreshold Enum

The modes that are available to segment a grayscale image using a single threshold.

Namespace: Euresys.Open_eVision

Absolute	Thresholds the image against a fixed, absolute gray level. The threshold value is fixed through EGrayscaleSingleThresholdSegmenter::AbsoluteThreshold.
Relative	Thresholds the image against a relative gray level: The actual threshold is selected so that a given fraction of the pixels of the image lie below it. The fraction is fixed through EGrayscaleSingleThresholdSegmenter::RelativeThreshold.

MinResidue	Thresholds the image using an automatically-computed value such that the quadratic difference between the source and thresholded image is minimized.
MaxEntropy	Thresholds the image using an automatically-computed value such that the entropy (i.e. the amount of information) of the resulting thresholded image is maximized.
IsoData	Thresholds the image using an automatically-computed value halfway between the average dark gray value (i.e. gray levels below the threshold) and average light gray values (i.e. gray levels above the threshold).

6.66. EHarrisThresholdingMode Enum

The thresholding modes for the Harris corner detector.

Namespace: Euresys.Open_eVision

Relative	Relative thresholding mode.
Absolute	Absolute thresholding mode.

6.67. EHeatmapColormap Enum

Color maps for visualizing the heatmap.

Namespace: Euresys.Open_eVision.EasyDeepLearning

YellowToRed	Colormap showing a gradient from yellow to red.
Jet	Colormap showing a gradient going from blue to gree to yellow to dark red.

6.68. EHistogramFeature Enum

The various parameters that can be extracted from a histogram.

Namespace: Euresys.Open_eVision

MostFrequentPixelValue	Value of the most frequent pixel.
MostFrequentPixelFrequency	Frequency of the most frequent pixel.

LeastFrequentPixelValue	Value of the least frequent pixel.
LeastFrequentPixelFrequency	Frequency of the least frequent pixel.
SmallestPixelValue	Smallest pixel value.
GreatestPixelValue	Largest pixel value.
PixelCount	Number of pixels.
AveragePixelValue	Mean of the pixel values.
PixelValueStdDev	Standard deviation of the pixel values.

6.69. EHitAndMissValue Enum

The allowed values for the elements of a hit-and-miss kernel.

Namespace: Euresys.Open_eVision

Background	The element belongs to the background.
DontCare	The element does not belongs to the background, neither to the foreground. It is ignored by the kernel.
Foreground	The element belongs to the foreground.

6.70. EImageAnnotationFormat Enum

Supported formats of annotation files for image file.

Namespace: Euresys.Open_eVision.EasyDeepLearning

None	No annotation.
YOLOTXT	The YOLO annotation format for EasyLocate bounding box. Annotation file: imagefilename.txt. Description of the format: each row of the file defines an object: class_id center_x center_y width height
PASCALVOCXML	Pascal VOC XML format for EasyLocate bounding box. Annotation file: imagefilename.xml. Description of the format: XML file. See the official Pascal VOC website for a description of the format (http://host.robots.ox.ac.uk/pascal/VOC/).

6.71. EImageFileType Enum

-

Namespace: Euresys.Open_eVision

Bmp	-
Jpeg2000	-
Jpeg	-
Png	-
Tiff	-
Auto	-
Euresys	-
Unknown	-

6.72. EImageType Enum

Image type.

Namespace: Euresys.Open_eVision

BW1	Bi-level image.
BW8	8 bits per pixel gray-level image.
BW16	16 bits per pixel gray-level image
BW32	32 bits per pixel gray-level image.
C15	15 bits per pixel color image (R:5, G:5, B:5).
C16	16 bits per pixel color image (R:5, G:6, B:5).
C24	24 bits per pixel color image (RGB).
C24A	32 bits per pixel color image (RGB + unused alpha channel).
C48	48 bits per pixel color image (RGB).
Depth8	8 bits per pixel gray-level image.
Depth16	16 bits per pixel gray-level image.
Depth32f	32 bits per pixel floating-point gray-level image.
BW32f	32 bits per pixel floating-point gray-level image.

Remarks

For example, an EImageC24 has type value C24 and its pixels are typed as EC24.

6.73. EKernelRectifier Enum

Possible values for the rectification mode of a kernel. This property allows specifying how negative convolution result values are handled.

Namespace: Euresys.Open_eVision

DoNotRectify	The offset of the kernel is added to the values resulting from the convolution. Negative values are then set to zero, and the values that exceed the maximum value for the image type are set to this maximum value.
KeepNegative	The positive values are discarded (set to zero) and the magnitude (absolute value) of the negative values is used.
KeepPositive	Positive value is used. The negative values are discarded (set to zero).
Absolute	The absolute value is used.

6.74. EKernelRotation Enum

Possible values for rotating a convolution kernel.

Namespace: Euresys.Open_eVision

NoRotation	No rotation of the structuring element.
Clockwise	Clockwise rotation (one full turn per pass).
Anticlockwise	Counterclockwise rotation (one full turn per pass).

6.75. EKernelType Enum

The types of convolution kernels that are supported by Open eVision.

Namespace: Euresys.Open_eVision

WhiteSkelet	White skeleton morphological probe.
BlackSkelet	Black skeleton morphological probe.
Edge	Edge detection morphological probe.
SobelX	X-axis Sobel derivative.
SobelY	Y-axis Sobel derivative.
PrewittX	X-axis Prewitt derivative.
PrewittY	Y-axis Prewitt derivative.
Laplacian4	4-connected Laplacian.

Laplacian8	8-connected Laplacian.
LowPass1	Low pass filter.
LowPass2	Low pass filter (average of neighbors).
LowPass3	Low pass filter (average).
HighPass1	High pass filter (value plus 4-connected Laplacian).
HighPass2	High pass filter (value plus 8-connected Laplacian).
Sobel	-
Prewitt	-
Roberts	-
Uniform3x3	-
Gaussian3x3	-
Uniform5x5	-
Gaussian5x5	-
Gaussian7x7	-
Uniform7x7	-
LaplacianX	-
LaplacianY	-
Gradient	-
GradientX	-
GradientY	-
Uniform	-
Gaussian	-

6.76. ELearnParam Enum

This enum is deprecated.

Allowed values for the kind of parameters that can be learnt by EasyMatrixCode.

Namespace: Euresys.Open_eVision

LogicalSize	The data matrix code symbol logical sizes the candidate is matched against at read time.
ContrastType	The data matrix code contrast types the candidate is matched against at read time.
Flipping	The data matrix code flipping values the candidate is matched against at read time.

Family	The data matrix code families the candidate is matched against at read time.
NumItems	-

6.77. ELegacyFeature Enum

The various parameters that can be extracted from a histogram. This enumeration pertains to the EasyObject legacy API. Please use ECodedImage2 instead.

Namespace: Euresys.Open_eVision

NoFeature	-
Class	Class number.
RunsNumber	Number of runs.
Area	Number of pixels. *(Signed Integer)*.
LargestRun	Size of the longest run. *(Signed Integer)*.
GravityCenterX	Abscissa of the gravity center. *(Float)*. (*)
GravityCenterY	Ordinate of the gravity center. *(Float)*. (*)
LimitCenterX	Abscissa of the center of the bounding box. *(Float)*. (*)
LimitCenterY	Ordinate of the center of the bounding box. *(Float)*. (*)
LimitWidth	Width of the bounding box (Feret's diameter 0 degrees). *(Float)*. (*)
LimitHeight	Height of the bounding box (Feret's diameter 90 degrees). *(Float)*. (*)
Limit45CenterX	Abscissa of the center of the 45 degrees bounding box. *(Float)*. (*)
Limit45CenterY	Ordinate of the center of the 45 degrees bounding box. *(Float)*. (*)
Limit45Width	Width of the 45 degrees bounding box (Feret's diameter 45 degrees). *(Float)*. (*)
Limit45Height	Height of the 45 degrees bounding box (Feret's diameter 135 degrees). *(Float)*. (*)
ContourX	Starting point abscissa of the object contour. *(Signed Integer)*.
ContourY	Starting point ordinate of the object contour. *(Signed Integer)*.
PixelMin	Minimum gray level of all pixels. *(Signed Integer)*.
PixelMax	Maximum gray level of all pixels. *(Signed Integer)*.
SigmaX	Centered moment of inertia around X (average squared X-deviation). *(Float)*.
SigmaY	Centered moment of inertia around Y (average squared Y-deviation). *(Float)*.
SigmaXY	Centered cross moment of inertia (average X-deviation * Y-deviation). *(Float)*.

SigmaXX	Reduced, centered moment of inertia (around the principal inertia axis). *(Float)*.
SigmaYY	Reduced, centered moment of inertia (around the secondary inertia axis). *(Float)*.
EllipseWidth	Long axis of the ellipse of inertia. *(Float)*. (*)
EllipseHeight	Short axis of the ellipse of inertia. *(Float)*. (*)
EllipseAngle	Direction of the principal axis of inertia. *(Float)*. (*)
CentroidX	Abscissa of the weighted gravity center. *(Float)*. (*)
CentroidY	Ordinate of the weighted gravity center. *(Float)*. (*)
PixelGrayAverage	Average gray-level value of the object pixels. *(Float)*.
PixelGrayVariance	Variance of the gray-level value of the object pixels. *(Float)*.
Limit22CenterX	Abscissa of the center of the 22.5 degrees bounding box. *(Float)*. (*)
Limit22CenterY	Ordinate of the center of the 22.5 degrees bounding box. *(Float)*. (*)
Limit22Width	Width of the 22.5 degrees bounding box (Feret's diameter 22.5 degrees). *(Float)*. (*)
Limit22Height	Height the 22.5 degrees bounding box (Feret's diameter 112.5 degrees). *(Float)*. (*)
Limit68CenterX	Abscissa of the center of the 67.5 degrees bounding box. *(Float)*. (*)
Limit68CenterY	Ordinate of the center of the 67.5 degrees bounding box. *(Float)*. (*)
Limit68Width	Width of the 67.5 degrees bounding box (Feret's diameter 67.5 degrees). *(Float)*. (*)
Limit68Height	Height of the 67.5 degrees bounding box (Feret's diameter 157.5 degrees). *(Float)*. (*)
LimitAngledCenterX	Abscissa of the center of the bounding box having a skew angle defined by the LimitAngle property. *(Float)*.
LimitAngledCenterY	Ordinate of the center of the bounding box having a skew angle defined by the LimitAngle property. *(Float)*.
LimitAngledWidth	Width of the bounding box having a skew angle defined by the LimitAngle property (Feret's diameter [LimitAngle]). *(Float)*.
LimitAngledHeight	Height of the bounding box having a skew angle defined by the LimitAngle property (Feret's diameter [LimitAngle + 90 degrees]). *(Float)*.
FeretCenterX	Abscissa of the Feret's bounding box center. *(Float)*. (*)
FeretCenterY	Ordinate of the Feret's bounding box center. *(Float)*. (*)
FeretWidth	Width of the Feret's bounding box. *(Float)*. (*)
FeretHeight	Height of the Feret's bounding box. *(Float)*. (*)
FeretAngle	Direction of the Feret's bounding box. *(Float)*. (*)
ObjectNumber	Identification number.
GravityCenter	Abscissa of the gravity center. *(Float)*. (*)

Limit	Abscissa of the center of the bounding box. *(Float)*. (*)
Limit22	Abscissa of the center of the 22.5 degrees bounding box. *(Float)*. (*)
Limit45	Abscissa of the center of the 45 degrees bounding box. *(Float)*. (*)
Limit68	Abscissa of the center of the 67.5 degrees bounding box. *(Float)*. (*)
LimitAngled	Abscissa of the center of the bounding box having a skew angle defined by the LimitAngle property. *(Float)*.
Ellipse	Long axis of the ellipse of inertia. *(Float)*. (*)
Centroid	-
Feret	-

6.78. ELineSpacingMode Enum

Allowed values for the line spacing mode of EasyOCR.

Namespace: Euresys.Open_eVision

Overlap	Two characters will belong to two different lines when the difference between the bottom of their boxes is larger than 30% of EOCR::MaxCharHeight.
Normal	Two characters will belong to two different lines when the bottom of one character box is higher than the top of the other.

6.79. ELocalSearchMode Enum

Allowed values for the local search mode of EasyFind.

Namespace: Euresys.Open_eVision

Basic	Default local search neighborhood. Sets EPatternFinder::AngleSearchExtent, EPatternFinder::ScaleSearchExtent, EPatternFinder::XSearchExtent and EPatternFinder::YSearchExtent to 3.
ExtendedTranslation	Local search neighborhood extended on the translation degrees of freedom. Sets EPatternFinder::AngleSearchExtent and EPatternFinder::ScaleSearchExtent to 3. Sets EPatternFinder::XSearchExtent and EPatternFinder::YSearchExtent to 5.
ExtendedAll	Local search neighborhood extended on all degrees of freedom. Sets EPatternFinder::AngleSearchExtent, EPatternFinder::ScaleSearchExtent, EPatternFinder::XSearchExtent and EPatternFinder::YSearchExtent to 5.

ExtendedMore	Local search neighborhood even more extended on all degrees of freedom. Sets EPatternFinder::AngleSearchExtent and EPatternFinder::ScaleSearchExtent to 7. Sets EPatternFinder::XSearchExtent and EPatternFinder::YSearchExtent to 9.
Reserved	Reserved for internal use.
Custom	Custom local search neighborhood. Set EPatternFinder::AngleSearchExtent, EPatternFinder::ScaleSearchExtent, EPatternFinder::XSearchExtent and EPatternFinder::YSearchExtent to custom values.

6.80. ELocatorCapacity Enum

The capacity of the locator deep learning network.
A larger capacity means that the underlying neural network is capable of learning more information but it will be slower.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Small	Small capacity.
Normal	Normal capacity.
Large	Large capacity.

6.81. ELocatorFeature Enum

Features supported by the ELocator or ELocatorObject.

Namespace: Euresys.Open_eVision.EasyDeepLearning

None	No features.
Position	The locator predicts the position of the object.
Size	The locator predicts the size of the object (width and height).

6.82. ELogicalSize Enum

This enum is deprecated.

Allowed values for the logical size of Data Matrix codes in EasyMatrixCode.

Namespace: Euresys.Open_eVision

_9x9	ECC 000-140 squares.
_11x11	ECC 000-140 squares.
_13x13	ECC 000-140 squares.
_15x15	ECC 000-140 squares.
_17x17	ECC 000-140 squares.
_19x19	ECC 000-140 squares.
_21x21	ECC 000-140 squares.
_23x23	ECC 000-140 squares.
_25x25	ECC 000-140 squares.
_27x27	ECC 000-140 squares.
_29x29	ECC 000-140 squares.
_31x31	ECC 000-140 squares.
_33x33	ECC 000-140 squares.
_35x35	ECC 000-140 squares.
_37x37	ECC 000-140 squares.
_39x39	ECC 000-140 squares.
_41x41	ECC 000-140 squares.
_43x43	ECC 000-140 squares.
_45x45	ECC 000-140 squares.
_47x47	ECC 000-140 squares.
_49x49	ECC 000-140 squares.
_10x10	ECC 200 squares.
_12x12	ECC 200 squares.
_14x14	ECC 200 squares.
_16x16	ECC 200 squares.
_18x18	ECC 200 squares.
_20x20	ECC 200 squares.
_22x22	ECC 200 squares.
_24x24	ECC 200 squares.
_26x26	ECC 200 squares.
_32x32	ECC 200 squares.
_36x36	ECC 200 squares.
_40x40	ECC 200 squares.
_44x44	ECC 200 squares.
_48x48	ECC 200 squares.

_52x52	ECC 200 squares.
_64x64	ECC 200 squares.
_72x72	ECC 200 squares.
_80x80	ECC 200 squares.
_88x88	ECC 200 squares.
_96x96	ECC 200 squares.
_104x104	ECC 200 squares.
_120x120	ECC 200 squares.
_132x132	ECC 200 squares.
_144x144	ECC 200 squares.
_8x18	ECC 200 rectangles
_8x32	ECC 200 rectangles
_12x26	ECC 200 rectangles
_12x36	ECC 200 rectangles
_16x36	ECC 200 rectangles
_16x48	ECC 200 rectangles
Unknown	To be determined at Read or Learn time.

Remarks

6.83. EMailBarcodeOrientation Enum

The orientations supported by EMailBarcode

Namespace: Euresys.Open_eVision

Unknown	Unknown orientation.
NoRotation	Non rotated barcode. Horizontal and read from left to right.
Rotated180	Upside-down barcode. Horizontal and read from right to left.
Rotated90Right	Barcode rotated 90 degrees to the right. Vertical and read from top to bottom.
Rotated90Left	Barcode rotated 90 degrees to the left. Vertical and read from bottom to top.
Horizontal	Barcode is horizontal.
Vertical	Barcode is vertical.
Any	Barcode has any one of the supported orientations.

6.84. EMailBarcodeSymbologies Enum

The symbologies supported by EMailBarcode

Namespace: Euresys.Open_eVision

Unknown	Unknown symbology.
JapanPost	Japan Post symbology.
Postnet	US POSTNET symbology.
Planet	US PLANET symbology.
IntelligentMail	US Intelligent Mail symbology.
USMail	US symbologies.

6.85. EMapConversionMode Enum

Conversion modes to use in EConverter.

Namespace: Euresys.Open_eVision.Easy3D

MaxDynamic	Use the mean as threshold.
Shift	Use the mean as threshold.

6.86. EMapConversionMode Enum

Conversion modes to use in EConverter.

Namespace: Euresys.Open_eVision.Easy3D

MaxDynamic	Use the mean as threshold.
Shift	Use the mean as threshold.

6.87. EMatchContrastMode Enum

Allowed values for the contrast mode of EasyMatch.

Namespace: Euresys.Open_eVision

Normal	Normal contrast. Pattern occurrences will be found with the same contrast as at learn time. Default mode.

Inverse	Inverse contrast. Pattern occurrences will be found with reversed contrast.
Any	Normal or inverse contrast. Pattern occurrences can be found both with normal and inverse contrast.

6.88. EMatchingMode Enum

Allowed values for the matching mode of EasyOCR.

Namespace: Euresys.Open_eVision

Rms	Root-mean-square error method is used.
Standard	Gray-level correlation method is used.
Normalized	Normalized gray-level correlation method is used.

6.89. EMatrixCodeContrastMode Enum

This enum is deprecated.

-

Namespace: Euresys.Open_eVision

BlackOnWhite	Dark cells on a light background.
WhiteOnBlack	Light cells on a dark background.

6.90. EMaximumAnalysisMode Enum

This enumeration contains the possible values for the analysis mode of the ELaserLineExtractor object.

Namespace: Euresys.Open_eVision.Easy3D

Peaks	Peak analysis mode.
Max	Maximum analysis mode.
COG	Center of gravity analysis mode.

6.91. ENoiseRemovalMethod Enum

Type of filter used in method EFilters::RemoveNoise.

Namespace: Euresys.Open_eVision.Easy3D

AbsoluteDifferenceFromMean	Removes points for which the deviation from the average height in the filter window is larger than the specified threshold. The threshold is the absolute value of the maximum difference.
RelativeDifferenceFromMean	Removes points for which the deviation from the average height in the filter window is larger than the specified threshold multiplied by the standard deviation (in the same filter window). The threshold is a factor.
HighStandardDeviation	Removes points for which the standard deviation calculated in the filter window is larger than a specified threshold. The threshold is the maximum standard deviation.

6.92. ENormalizationMode Enum

Allowed values for the gray-level normalization mode in EChecker2 and EasyOCV.

Namespace: Euresys.Open_eVision

NoNormalization	No gray-level normalization (contrast changes will be detected).
Moments	Contrast normalization based on linear change.
Threshold	Contrast normalization based on non-linear change.

6.93. EObjectBasedCalibrationPrecisionVsSpeedTradeOff Enum

The precision vs speed trade-off.

Namespace: Euresys.Open_eVision.Easy3D

Fast	Fast mode.
Balanced	Balanced mode.
Precise	Precise mode.

6.94. EObjectBasedCalibrationType Enum

The type of the calibration object.

Namespace: Euresys.Open_eVision.Easy3D

DoublePyramid	Double Pyramid calibration model.
TruncatedDoublePyramid	Double Truncated Pyramid calibration model.
NotDefined	Not Defined.

6.95. EOCR2Classifier Enum

This enumeration contains the different types of classifier for character recognition in EOCR2.

Namespace: Euresys.Open_eVision

DatabaseClassifier	This classifier uses a EOCR2CharacterDatabase to recognize characters.
Industrial_A_Z_0_9_P	This classifier is a pre-trained classifier using Deep-Learning to recognize characters of various fonts commonly used in an industrial context (chips, processors, ...). Current allowed characters are numbers, upper-case letters and few punctuation symbols (. , : / + -). This classifier is not suited for characters using specific fonts like OCR-A or SEMI-FONT.
OCRA_A_Z_0_9_P	This classifier is a pre-trained classifier using Deep-Learning to recognize characters with OCR-A font.
SEMI_A_Z_0_9_P	This classifier is a pre-trained classifier using Deep-Learning to recognize characters with SEMI-OCR font.

6.96. EOCR2DetectionMethod Enum

This enumeration contains the possible methods for text detection in EOCR2.

Namespace: Euresys.Open_eVision

FixedWidth	This method is suited for detecting texts with fixed-with fonts and dotted characters.
Proportional	This method is suited for detecting texts with proportional fonts.

6.97. EOCR2SegmentationMethod Enum

This enumeration contains the possible methods for image segmentation in EOCR2.

Namespace: Euresys.Open_eVision

Local	This method is more complex and suited for segmenting images with text on a nonuniform background, it uses a local threshold value that can be different for each character of the text.
Global	This method is fast and suited for segmenting images with clear text on a uniform background, it uses a global threshold value.

6.98. EOCRClass Enum

Allowed values for the class of pattern in EasyOCR. These classes have no pre-defined meaning, the user is free to give them any meaning they like. For instance, class 0 could contains only digits, class 1 only the forward slash character, class 3 uppercase letters, etc. Any choice is allowed, as long as the correct classes are specified during the learning process. During recognition/reading, the user can specify the expected class for each character. This means that if a forward slash is expected at that position, they can say it should be class 1 (following the example from above). This will improve the recognition rate and speed because the algorithm only has to choose between characters within the specified class.

Namespace: Euresys.Open_eVision

_0	Character belongs to class 0.
_1	Character belongs to class 1.
_2	Character belongs to class 2.
_3	Character belongs to class 3.
_4	Character belongs to class 4.
_5	Character belongs to class 5.
_6	Character belongs to class 6.
_7	Character belongs to class 7.
_8	Character belongs to class 8.
_9	Character belongs to class 9.
_10	Character belongs to class 10.
_11	Character belongs to class 11.
_12	Character belongs to class 12.
_13	Character belongs to class 13.
_14	Character belongs to class 14.
_15	Character belongs to class 15.

_16	Character belongs to class 16.
_17	Character belongs to class 17.
_18	Character belongs to class 18.
_19	Character belongs to class 19.
_20	Character belongs to class 20.
_21	Character belongs to class 21.
_22	Character belongs to class 22.
_23	Character belongs to class 23.
_24	Character belongs to class 24.
_25	Character belongs to class 25.
_26	Character belongs to class 26.
_27	Character belongs to class 27.
_28	Character belongs to class 28.
_29	Character belongs to class 29.
_30	Character belongs to class 30.
Digit	Character belongs to class 0. Equivalent to _0.
UpperCase	Character belongs to class 1. Equivalent to _1.
LowerCase	Character belongs to class 2. Equivalent to _2.
Special	Character belongs to class 3. Equivalent to _3.
Extended	Character belongs to class 4. Equivalent to _4.
AllClasses	Character belongs to all classes, from 0 to 31 included.

6.99. EOCRColor Enum

Allowed values for the text color in EasyOCR.

Namespace: Euresys.Open_eVision

BlackOnWhite	The characters appear darker than the background.
WhiteOnBlack	The characters appear lighter than the background.
DarkOnLight	The characters appear darker than the background. No thresholding takes place when the characters are learnt and/or recognized.
LightOnDark	The characters appear lighter than the background. No thresholding takes place when the characters are learnt and/or recognized.

6.100. EPathVectorDrawOption Enum

-

Namespace: Euresys.Open_eVision

TopLeft	Link the pixel of the path by the top left corner of the pixels.
Center	Link the pixel of the path by the center of the pixels.
Fill	Fill the pixel that are part of the path.

6.101. EPatternStyle Enum

Allowed values for the nature of the pattern in EasyFind.

Namespace: Euresys.Open_eVision

Rasterized	Defines the rasterized pattern style.
Vectorized	Defines the vectorized pattern type.
Unknown	-

6.102. EPatternType Enum

Allowed values for the type of patterns in EasyFind.

Namespace: Euresys.Open_eVision

ConsistentEdges	Defines the ConsistentEdges pattern type.
ThinStructure	Defines the ThinStructure pattern type.
Unknown	-

6.103. EPenStyle Enum

Pen style.

Namespace: Euresys.Open_eVision

Solid	Solid pen.
Dash	Dash pen.
DashDot	Dash dot pen.

DashDotDot	Dash dot dot pen.
Dot	Dot pen.

6.104. EPhotometricStereoContrast Enum

This enumeration contains the possible ways to handle the contrast when retrieving Albedos, Gaussian curvatures or Mean curvatures. See EPhotometricStereoImager::GetAlbedos, EPhotometricStereoImager::ComputeMeanCurvatures and EPhotometricStereoImager::ComputeGaussianCurvatures.

Namespace: Euresys.Open_eVision.Easy3D

FullRange	The full range of the image is linearly scaled. The image may need further post-processing in this case to remove outliers.
HighContrast	Produce images with a high contrast, to do so, outliers will be clipped. Scaling is linear. This increases the contrast so images may seem noisy.
FixedRange	Scaling is performed linearly using the specified range. Some default values are provided but user may need to specify them as they depend on the camera resolution and the object captured. This is interesting when several images of similar objects must have the same range.

6.105. EPickingMode Enum

-

Namespace: Euresys.Open_eVision

All	-
Begin	-
End	-
Central	-
Score	-

6.106. EPlaneCropperType Enum

Type of crop to use in EPlaneCropper.

Namespace: Euresys.Open_eVision.Easy3D

KeepAbove	Only the points above the plane are selected.

KeepBelow	Only the points below the plane are selected.
KeepClose	Only the points closer to the plane than a specified distance ("maxDistance") are selected.
KeepFar	Only the points further away from the plane than a specified distance ("maxDistance") are selected.

6.107. EPlotItem Enum

Defines how the profile is drawed across a gauge.

Namespace: Euresys.Open_eVision

Transitions	Displays the profile along a point location gauge.
Peak	Displays the corresponding derivative curve.
Thresholds	Displays the threshold and minimum amplitude levels.
Points	Displays the valid transitions.

6.108. EPointCloudFilteringMethod Enum

Type of filtering method to use in EPointCloudFilter.

Namespace: Euresys.Open_eVision.Easy3D

DistanceFromMean	Removes points for which the distance from the average of the neighborhood is larger than for other points of the cloud. Points whose criterion is greater than mean + thresholdMultiplier * stddev are removed, mean and stddev being the mean and standard derivation of the criterion across all points of the cloud and thresholdMultiplier a factor set by EPointCloudFilter::ThresholdMultiplier.
HighStandardDeviation	Removes points for which the standard deviation calculated in the neighborhood is larger than for other points of the cloud. Points whose criterion is greater than mean + thresholdMultiplier * stddev are removed, mean and stddev being the mean and standard derivation of the criterion across all points of the cloud and thresholdMultiplier a factor set by EPointCloudFilter::ThresholdMultiplier. Unlike DistanceFromMean, this method does not filter points at the extremities of a surface. On the other hand, it is more sensitive to the value of the threshold.

6.109. EPolygonMeasurementMode Enum

PolygonGauge measurement mode

Namespace: Euresys.Open_eVision

Global	The polygon is rigid, only the global position and the orientation are adjusted. If EPolygonGauge::EnableScaling is enabled, a scale factor is also computed.
Edge	The edges of the polygon are measured independently. The result is a new polygon composed by these fitted edges. The measured polygon has the same number of vertices.
Point	The polygon edges are sampled to fit closely to the measured points. The new polygon uses all the measured points of the contour.

6.110. EProjectionType Enum

This enumeration contains the possible values for the parameter of E3DViewer::ProjectionType method.

Namespace: Euresys.Open_eVision.Easy3D

Orthographic	Use an orthographic projection
Perspective	Use an perspective projection

6.111. EQRCodeCodingMode Enum

This enumeration contains the possible values for the coding mode of a QR code. Used by EQRCodeDecodedStream.

Namespace: Euresys.Open_eVision

Basic	The QR code does not use a specific coding mode.
Fnc1_Gs1	The QR code uses the FNC1/GS1 coding mode (FNC1 in first position).
Fnc1_Aim	The QR code uses the FNC1/AIM coding mode (FNC1 in second position).
ECI	The QR code uses Extended Channel Interpretation (ECI) coding mode.

6.112. EQRCodeEncoding Enum

This enumeration contains the possible values for the encoding used for parts of the bit stream of a QR code, contained by the EQRCodeDecodedStreamPart object.

Namespace: Euresys.Open_eVision

Numeric	The stream part is coded numerically.
Alphanumeric	The stream part is coded alphanumerically.
Byte	The stream part is coded as bytes.
Kanji	The stream part is coded in Kanji.

6.113. EQRCodeLevel Enum

This enumeration contains the possible values for the level of error correction of a QR code. Used in EQRCode.

Namespace: Euresys.Open_eVision

L	The QR code is level L (about 7% of error correction).
M	The QR code is level M (about 15% of error correction).
Q	The QR code is level Q (about 25% of error correction).
H	The QR code is level H (about 30% of error correction).
NoCorrection	The code has only error detection capacity (micro QR code (Version M1) only).

6.114. EQRCodeModel Enum

This enumeration contains the possible values for a QR code model. Used in EQRCode and EQRCodeReader.

Namespace: Euresys.Open_eVision

Model1	The QR code is a model 1.
Model2	The QR code is a model 2 or 2005.
MicroQR	The QR code is a Micro QR.

6.115. EQRCodeScanPrecision Enum

This enumeration contains the possible values for the scanning precision used by an EQRCodeReader object.

Namespace: Euresys.Open_eVision

Automatic	The QR code reader determines the scan precision automatically.
Fine	The QR code reader scans finely the search field to find the QR codes. This value is recommended for small images or large images with small QR codes.
Coarse	The QR code reader scans coarsely the search field to find the QR codes. This value is recommended for large images with medium to large QR codes.

6.116. EQRDetectionMethod Enum

This enumeration contains the possible detection methods the EQRCodeReader can use to detect QR codes. Combinations of the methods are allowed.

Namespace: Euresys.Open_eVision

AdaptiveThreshold	This method detects finder patterns based on adaptive thresholding of the image.
Gradient	This method detects finder patterns based on gradients in the image.
PerspectiveLegacy	This selects the gradient-based detection algorithms with improved perspective mode developed for eVision 1.2.2.
GradientLegacy	This selects the gradient-based detection algorithms with basic perspective mode developed for eVision 1.2.2.

6.117. EQRDetectionTradeOff Enum

This enumeration contains several settings for the trade-off between detection speed and reliability of the EasyQRCode methods.
Setting this parameter will overwrite the current settings for EQRDetectionMethod and EQRCodeScanPrecision.

Namespace: Euresys.Open_eVision

FavorSpeed	This setting gives the fastest detection speed, but may reduce the detection accuracy. Sets EQRDetectionMethod_AdaptiveThreshold and EQRCodeScanPrecision_Coarse.

Balanced	This setting gives a balance between detection speed and reliability. Sets EQRDetectionMethod_AdaptiveThreshold | EQRDetectionMethod_Gradient and EQRCodeScanPrecision_Automatic.
FavorReliability	This setting gives the best detection reliability, at the cost of detection speed. Sets EQRDetectionMethod_AdaptiveThreshold | EQRDetectionMethod_Gradient and EQRCodeScanPrecision_Fine.
Custom	This setting is returned when the current settings EQRDetectionMethod and EQRCodeScanPrecision do not match any of the EQRDetectionTradeOff presets. This choice should NOT be used to set a desired trade-off setting.

6.118. EReadingOrientation Enum

Represents the orientation to assume when decoding a barcode without start/stop patterns, for example those of PharmacodeOneTrack.

Namespace: Euresys.Open_eVision.EasyBarCode2

LeftToRight	Barcodes without start/stop patterns will be decoded with the orientation that is closest from left to right.
RightToLeft	Barcodes without start/stop patterns will be decoded with the orientation that is closest from right to left.
TopToBottom	Barcodes without start/stop patterns will be decoded with the orientation that is closest from top to bottom.
BottomToTop	Barcodes without start/stop patterns will be decoded with the orientation that is closest from bottom to top.

6.119. EReadMode Enum

This enumeration contains the possible operation modes for the EMatrixCodeReader::Read method

Namespace: Euresys.Open_eVision.EasyMatrixCode2

Speed	The EMatrixCodeReader::Read method will halt as soon as one of the following is true: (1) it has found the required number of codes given by EMatrixCodeReader::MaxNumCodes. (2) it reaches the timelimit given by EMatrixCodeReader::TimeOut. (3) it has completely finished its process. This mode will result in the shortest processing times.

Quality	The EMatrixCodeReader::Read method will keep trying to improve its detection until one of the following is true: (1) it reaches the timelimit given by EMatrixCodeReader::TimeOut. (2) it has completely finished its process. This mode will results in the best grading results.

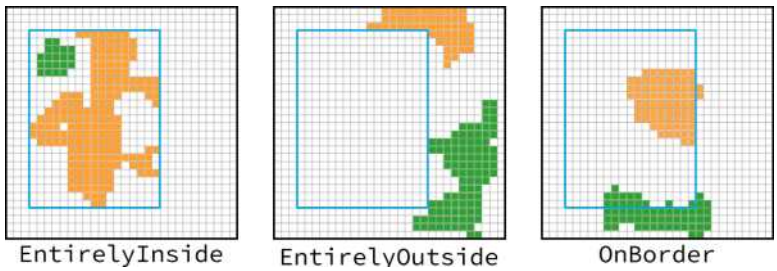
6.120. ERectangleMode Enum

The modes that specify how the selection of coded elements with a rectangle behaves.

Namespace: Euresys.Open_eVision

EntirelyInside	Takes into consideration only the coded elements that entirely lie inside the given rectangle, not touching its borders
EntirelyOutside	Takes into consideration only the coded elements that entirely lie outside the given rectangle, not touching its borders.
InsideOrOnBorder	Takes into consideration only the coded elements that entirely lie inside the given rectangle, or that touch its borders.
OutsideOrOnBorder	Takes into consideration only the coded elements that entirely lie outside the given rectangle, or that touch its borders.
OnBorder	Takes into consideration only the coded elements that touch the borders of the rectangle.

Remarks



<caption>Examples of objects matching the categories EntirelyInside, EntirelyOutise, and OnBorder.</caption>

6.121. EReductionMode Enum

The reduction mode to be used when learning a Consistent Edges model.

Namespace: Euresys.Open_eVision

Auto	Use the best-guess algorithm for selecting the reduction strength when learning a model.
Manual	Use a user-set value for the reduction strength when learning a model (cf. the property EPatternFinder::ReductionStrength).

Unknown	-

6.122. EReferenceNoise Enum

Enumeration for specifying how a reference image is affected by noise in EasyImage.

Namespace: Euresys.Open_eVision

NoReference	The reference image is free from noise (synthetic image or noise source cancelled).
SameAsImage	The reference image is contaminated by the same noise source as the source image.

6.123. ERgbStandard Enum

Allowed values for the RGB standard in EasyColor.

Namespace: Euresys.Open_eVision

Ntsc	NTSC primaries with the following CIE XYZ coordinates: Red: (0.607, 0.299, 0.000), Green: (0.174, 0.587, 0.066), Blue: (0.201, 0.114, 1.117). NTSC uses the white point "C". When used, color to gray equation is R * 0.299 + G * 0.587 + B * 0.114.
Pal	PAL primaries with the following CIE XYZ coordinates: Red: (0.4303, 0.2219, 0.0202), Green: (0.3416, 0.7068, 0.1296), Blue: (0.1784, 0.0713, 0.9393). PAL uses the white point "D65". When used, color to gray equation is R * 0.2219 + G * 0.7068 + B * 0.0713.
Smpte	SMPTE primaries with the following CIE XYZ coordinates: Red: (0.393, 0.212, 0.019), Green: (0.365, 0.701, 0.112), Blue: (0.192, 0.087, 0.958). SMPTE uses the white point "D65". When used, color to gray equation is R * 0.212 + G * 0.701 + B * 0.087.
SRGB	sRGB primaries with the following CIE XYZ coordinates: Red: (0.412, 0.212, 0.019), Green: (0.357, 0.715, 0.119), Blue: (0.180, 0.072, 0.950). sRGB uses the white point "D65". When used, color to gray equation is R * 0.212 + G * 0.715 + B * 0.072.

Remarks

The definition of the RGB primaries is not unique. In principle, there is one RGB system for each set of phosphors used in color monitors. Anyway, the CCIR has defined standard combinations for use in digital TV broadcast. Before performing a conversion, function EasyColor::RgbStandard can be used to specify the standard used.

6.124. ERoiHit Enum

Describes the ROI that was hit by the mouse cursor.

Namespace: Euresys.Open_eVision

NoHit	No ROI.
Learn_0	First learning ROI.
Learn_1	Second learning ROI.
Match_0	First matching ROI.
Match_1	Second matching ROI.
Inspect	Inspection ROI.

6.125. ERotationRightAngles Enum

Clockwise Right angles for rotation.

Namespace: Euresys.Open_eVision

ROTATION_90_CW	-
ROTATION_180_CW	-
ROTATION_270_CW	-

6.126. ESegmentationMethod Enum

The segmentation methods that are available to the image encoder.

Namespace: Euresys.Open_eVision

Custom	-
BinaryImage	Segmentation of binary images (cf. EBinaryImageSegmenter).
ColorRangeThreshold	Segments a color image by specifying a cube in the RGB space (cf. EColorRangeThresholdSegmenter).
ColorSingleThreshold	Segments a color image by specifying a single threshold (cf. EColorSingleThresholdSegmenter).
GrayscaleDoubleThreshold	Segments a grayscale image by specifying a double threshold (cf. EGrayscaleDoubleThresholdSegmenter).
GrayscaleSingleThreshold	Segments a grayscale image by specifying a single threshold (cf. EGrayscaleSingleThresholdSegmenter).

ImageRange	Segments an image by specifying a pixel-by-pixel double threshold (cf. EGrayscaleDoubleThresholdSegmenter).
ReferenceImage	Segments an image by specifying a pixel-by-pixel single threshold (cf. EGrayscaleSingleThresholdSegmenter).
LabeledImage	Segments an image by mapping the value of the pixels directly to a layer index (cf. ELabeledImageSegmenter).

Remarks

The parameters of the segmentation methods are configured through the getters finishing by "Segmenter" that are available in EImageEncoder.

6.127. ESegmentationMode Enum

Allowed values for the segmentation mode in EasyOCR.

Namespace: Euresys.Open_eVision

KeepObjects	After segmentation, keep the blobs as they were found.
RepasteObjects	After segmentation, group together the blobs believed to belong to the same character.

6.128. ESelectByPosition Enum

Allowed values for the selection mode of ECodedImage.

Namespace: Euresys.Open_eVision

InsertIn	Insert the objects completely inside the given area.
InsertTouch	Insert all the objects with a non-empty intersection with the given area.
InsertOut	Insert the objects completely outside the given area.
RemoveIn	Remove the objects completely inside the given area.
RemoveTouch	Remove all the objects with a non-empty intersection with the given area.
RemoveOut	Remove the objects completely outside the given area.
RemoveBorder	Remove the objects outside the given area (including the objects touching the given area boundary).

Remarks

When specifying the position by means of an ROI, the minimum width and height of the ROI object must be at least 3 pixels. This enumeration pertains to the EasyObject legacy API and should not be used for new developments. See ECodedImage2 for the new API.

6.129. ESelectionFlag Enum

Specifies to which subset of a selection an operation should be applied in EasyObject and EasyOCV.

Namespace: Euresys.Open_eVision

Any	The operation applies to both selected and unselected items.
True	The operation applies to selected items only.
False	The operation applies to unselected items only.

6.130. ESelectOption Enum

Allowed values for the selection mode of ECodedImage. This enumeration pertains to the EasyObject legacy API and should not be used for new developments. See ECodedImage2 for the new API.

Namespace: Euresys.Open_eVision

InsertAll	Add all objects.
InsertGreaterOrEqual	Add all objects with feature value above the upper threshold.
InsertLesserOrEqual	Add all objects with feature value below the lower threshold.
InsertRange	Add all objects with feature value between or equal to the lower and upper thresholds.
RemoveAll	Delete all objects.
RemoveGreaterOrEqual	Delete all objects with feature value above the lower threshold.
RemoveLesserOrEqual	Delete all objects with feature value below the upper threshold.
RemoveRange	Delete all objects with feature value between or equal to the lower and upper thresholds.
InsertOutOfRange	Add all objects with feature value above the upper and below the lower threshold.
RemoveOutOfRange	Delete all objects with feature value above the upper and below the lower threshold.

6.131. ESerializerFileWriterMode Enum

Creation mode of the file.

Namespace: Euresys.Open_eVision

Create	Creates the archive file on the hard disk. If the file already exists, the ESerializer::CreateFileWriter method returns NULL.
Overwrite	Overwrites the previously created archive if it already exists, or creates it otherwise.
Append	Appends the data at the end of the previously created archive, or creates the archive if it doesn't exist.

6.132. EShapeBehavior Enum

Allowed values for conditions on the behavior of a shape.

Namespace: Euresys.Open_eVision

Visible	Identifies a visible shape.
Selected	Identifies a selected shape.
Selectable	Identifies a selectable shape.
Dragable	Identifies a dragable shape.
Rotatable	Identifies a rotatable shape.
Resizable	Identifies a resizable shape.
Labeled	Identifies a labeled shape.
Active	Identifies an active shape.
Passed	Identifies a non defective shape.

6.133. EShapeType Enum

Shape type.

Namespace: Euresys.Open_eVision

NoShape	-
PointShape	Defines a point shape.
LineShape	Defines a line shape.
CircleShape	Defines a circle shape.
WedgeShape	Defines a wedge shape.
RectangleShape	Defines a rectangle shape.
FrameShape	Defines a frame shape.
WorldShape	Defines a world shape.
PointGauge	Defines a point location gauge.

LineGauge	Defines a line fitting gauge.
CircleGauge	Defines a circle fitting gauge.
RectangleGauge	Defines a rectangle fitting gauge.
WedgeGauge	Defines a wedge fitting gauge.
PolygonGauge	Defines a polygon fitting gauge.
PolygonShape	Defines a polygon shape.

6.134. EShiftingMode Enum

Allowed values for the shifting mode of EasyOCR.

Namespace: Euresys.Open_eVision

Chars	Each character is moved individually.
Text	The all set of characters is moved together.

6.135. ESingleThresholdMode Enum

The single threshold mode for the selection of coded elements with respect to a given feature.

Namespace: Euresys.Open_eVision

Less	The value of the feature must be strictly less than the threshold.
LessEqual	The value of the feature must be less or equal to the threshold.
Equal	The value of the feature must be equal to the threshold.
GreaterEqual	The value of the feature must be greater or equal to the threshold.
Greater	The value of the feature must be strictly greater than the threshold.
Different	The value of the feature must be different to the threshold.

6.136. ESortDirection Enum

The sorting mode for selections of coded elements based on their features.

Namespace: Euresys.Open_eVision

Ascending	Sorts the coded elements with respect to a given feature, in ascending order.

Descending	Sorts the coded elements with respect to a given feature, in descending order.

6.137. ESortOption Enum

Allowed values for the sort mode of ECodedImage. This enumeration pertains to the EasyObject legacy API and should not be used for new developments. See ECodedImage2 for the new API.

Namespace: Euresys.Open_eVision

Ascending	Sort by increasing feature values.
Descending	Sort by decreasing feature values.

6.138. ESourceColorMode Enum

This enumeration contains the modes for the display of the point cloud colors.

Namespace: Euresys.Open_eVision.Easy3D

Constant	Constant color for all the points (defined by E3DViewer::SetRenderSourceConstantColor).
Ramp	Use a color ramp (defined by E3DViewer::GenerateColors).
Attribute	Use the color attributes of the point cloud (if defined).

6.139. ESpotPolarity Enum

The possible polarities of an ESpot.

Namespace: Euresys.Open_eVision

Black	The spot is darker than its surroundings.
White	The spot is lighter than its surroundings.
Any	The spot can be darker or lighter than its surroundings.

6.140. ESpotType Enum

The possible types of an ESpot.

Namespace: Euresys.Open_eVision

Particle	The spot is a compact defect, like dust, hole, pinch.
Scratch	The spot is an elongated defect, with the shape of a line.

6.141. EStockMeasurementUnit Enum

Allowed values for the type of Measurement Unit.

Namespace: Euresys.Open_eVision

None	Defines the None value type.
um	Defines the micron meter value type.
mm	Defines the milimeter value type.
cm	Defines the centimeter value type.
dm	Defines the decimeter value type.
m	Defines the meter value type.
dam	Defines the decameter value type.
hm	Defines the Hectometer value type.
km	Defines the Kilometer value type.
mil	Defines the milliliter value type.
inch	Defines the inch value type.
foot	Defines the foot value type.
yard	Defines the yard value type.
mile	Defines the mile value type.

6.142. ESupervisedSegmenterCapacity Enum

The capacity of the supervised segmentation network.
A larger capacity means that the underlying neural network is capable of learning more information but it will be slower.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Small	Small capacity.
Normal	Normal capacity.
Large	Large capacity.

6.143. ESymbologies Enum

This enum is deprecated.

The symbologies supported by EasyBarCode.

Namespace: Euresys.Open_eVision

Standard_Symbologies	Reserved for internal use
Additional_ Symbologies	Reserved for internal use
Codabar	Codabar symbology.
Code128	Code 128 symbology.
Code25Interleaved	Code 25 Interleaved symbology.
Code39	Code 39 symbology.
Ean128	EAN 128 symbology.
Ean13	EAN 13 symbology.
Msi	MSI symbology.
UpcA	UPC A symbology.
UpcE	UPC E symbology.
BinaryCode	Binary Code symbology.
AdsAnker	Code ABC Anker symbology.
Bc412	Code BC 412 symbology.
Code11	Code 11 symbology.
Code13	Code 13 symbology.
Code25Datalogic	Code 25 DataLogic symbology.
Code25Matrix	Code 25 Matrix symbology.
Code25Iata	Code 25 IATA symbology.
Code25Industry	Code 25 Industry symbology.
Code25Compressed	Code 25 Compressed symbology.
Code25Inverted	Code 25 Inverted symbology.
Code32	Code 32 symbology.
Code39Extended	Code 39 Extended symbology.
Code39Reduced	Code 39 Reduced symbology.
Code93	Code 93 symbology.
Code93Extended	Code 93 Extended symbology.
CodeBcdMatrix	Code BCD Matrix symbology.

CodeCip	Code CIP symbology.
CodeStk	Code STK symbology.
Ean8	EAN 8 symbology.
IbmDeltaDistanceA	IBM Delta Distance A symbology.
Plessey	Plessey symbology.
Telepen	Telepen symbology.
Rss14	RSS-14 symbology.
Rss14Limited	RSS-14 Limited symbology.
Rss14Expanded	RSS-14 Expanded symbology.
Standard	Gathers all the symbologies belonging to the standard group.
Additional	Gathers all the symbologies belonging to the additional group.
Unknown	-

Remarks

Due to the large number of supported symbologies, they have been splitted into two groups. The most commonly used symbologies have been gathered under the name Standard symbologies. The remaining symbologies belong to the Additional symbologies group.

6.144. ESymbolPolarity Enum

Allowed values for the polarity of a code.

Namespace: Euresys.Open_eVision

BlackOnWhite	Dark cells on a light background.
WhiteOnBlack	Light cells on a dark background.

6.145. ETextLabelAlignment Enum

This enumeration contains the alignment of the text labels

Namespace: Euresys.Open_eVision.Easy3D

FromPosition	Aligned towards the line between the anchor and the label (default)
Left	Aligned left
Right	Aligned right

6.146. EThinStructureMode Enum

Allowed values for the type of thin structures in EasyFind.

Namespace: Euresys.Open_eVision

Auto	Lets EasyFind choose automatically the best contrast of thin elements.
Dark	Favors thin elements darker than regions.
Bright	Favors thin elements brighter than regions.

6.147. EThresholdMode Enum

The various modes for thresholding that are supported by Open eVision.

Namespace: Euresys.Open_eVision

Absolute	Reserved value. For absolute thresholding, use the threshold value itself, cast to EThresholdMode.
Relative	Relative threshold; determines the required threshold level so that a given fraction of the image pixels lie below it.
MinResidue	Selects a threshold value such that the quadratic difference between the source and thresholded image is minimized.
MaxEntropy	Selects a threshold value such that the entropy (i.e. the amount of information) of the resulting thresholded image is maximized.
Isodata	Selects a threshold value that lies halfway between the average dark gray value (i.e. gray levels below the threshold) and average light gray values (i.e. gray levels above the threshold).

6.148. ETrainingMode Enum

Allowed values for the training mode in EChecker.

Namespace: Euresys.Open_eVision

Precise	Precise training mode. This mode uses a two-pass training process to compute the threshold images. It gives better results at the cost of training time. Use this mode if you have harder to spot defects or lot of variation in the training images.
Quick	Quick training mode. This mode uses a quick, one-pass training process to compute the threshold images. Training time is lowered, but the results might be less reliable. Use this mode if you have easy to spot defects and few variation in the training images.

6.149. ETransitionChoice Enum

The transition selection method applied by the gauge measurement

Namespace: Euresys.Open_eVision

NthFromBegin	N-th transition from the beginning (counting from 0).
NthFromEnd	N-th transition from the end (counting from 0).
LargestAmplitude	Transition whose peak has the largest amplitude value.
LargestArea	Transition whose peak has the largest area value.
Closest	Transition closest to the center.
All	All transitions.

6.150. ETransitionType Enum

The type of transition to be retained by the gauge measurement

Namespace: Euresys.Open_eVision

Bw	Black to white.
Wb	White to black.
BwOrWb	Black to white or white to black.
Bwb	Black to white to black.
Wbw	White to black to white.

6.151. EUIAPI Enum

This enumeration contains the various User Interface API supported by E3DViewer

Namespace: Euresys.Open_eVision.Easy3D

Win32	The E3DViewer is used in a Windows Win32 application
Qt	The E3DViewer is used in a Qt application (Windows or Linux)

6.152. EUnsupervisedScore Enum

Unsupervised scores for an unsupervised segmentation result.
These scores can be used for classification purposes.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Absolute	Absolute score (normalized L1 distance between the input image and its reconstruction by the network).
MeanSquared	Mean squared score (normalized L2 distance between the input image and its reconstruction by the network).
Maximum	Maximum absolute score (normalized L-Inf distance between the input image and its reconstruction).
BlobSize	Absolute score for which there is no contiguous area (blob) in the reconstruction error bigger than the smallest defect size of the unsupervised segmenter (See EUnsupervisedSegmenter).

6.153. EUnsupervisedSegmenterCapacity Enum

The capacity of the unsupervised network.
A larger capacity means that the underlying neural network is capable of learning more information but it will be slower.

Namespace: Euresys.Open_eVision.EasyDeepLearning

Small	Small capacity.
Normal	Normal capacity.
Large	Large capacity.

6.154. EVerbosity Enum

The verbosity level of a Memento message.

Namespace: Euresys.Open_eVision

Critical	Critical (verbosity level 1). Highest Severity.
Error	Error (verbosity level 2)
Warning	Warning (verbosity level 3)
Notice	Notice (verbosity level 4)
Info	Info (verbosity level 5)
Debug	Debug (verbosity level 6)
Verbose	Verbose (verbosity level 7). Lowest Severity.

6.155. EViewDirection Enum

This enumeration contains the axis aligned view directions.

Namespace: Euresys.Open_eVision.Easy3D

NegX	Negative X
PosX	Positive X
NegY	Negative Y
PosY	Positive Y
NegZ	Negative Z
PosZ	Positive Z

6.156. EZMapGeneratorResolutionXYMode Enum

Mode used to specify the resolution of the ZMap generated on the x and y axes

Namespace: Euresys.Open_eVision.Easy3D

Absolute	resolution is specified in absolute units (e.g mm/pixel)
Relative	resolution is specified relative to the size of the object. A value of 1 means resolution is computed so as to get one point per pixel assuming points are uniformly distributed.

6.157. EZMapOrientationVectorMode Enum

The EZMap orientation, it's the direction of the X (width) axis of the ZMap.

Namespace: Euresys.Open_eVision.Easy3D

Auto	Chooses automatically the orientation of the ZMap.
XAxis	The X (width) axis of the ZMap is aligned with the world X axis.
YAxis	The X (width) axis of the ZMap is aligned with the world Y axis.
ZAxis	The X (width) axis of the ZMap is aligned with the world Z axis.
Explicit	The orientation vector is arbitrary and given by the method SetOrientationVector.

6.158. EZMapReferencePlaneMode Enum

The 3D reference plane used to build the EZMap.

Namespace: Euresys.Open_eVision.Easy3D

XPlane	The reference plane is orthogonal to the X axis (YZ domain).
YPlane	The reference plane is orthogonal to the Y axis (XZ domain).
ZPlane	The reference plane is orthogonal to the Z axis (XY domain). That's the default reference plane.
Explicit	The reference plane is arbitrary and given by the method SetReferencePlane.

6.159. Features Enum

Open eVision Features.

Namespace: Euresys.Open_eVision.LicenseFeatures

EasyGauge	-
EasyColor	-
EasyImage	-
EasyObject	-
EasyBarCode	-
EasyMatch	-
eVisionStudio	-
EasyFind	-
EasyMatrixCode	-
EasyOCR	-
EasyOCV	-
EasyQRCode	-
EasyOCR2	-
Easy3D	-
EasyClassify	-
Easy3DObject	-
Easy3DMatch	-
Easy3DLaserLine	-
EasySegment	-

EasyLocate	-
Gigelink	-
Recorder	-
EasySpotDetector	-