6/27/2024

Datasheet

Inspection Bundle

Bundle of Open eVision inspection libraries

- Cost effective bundle of eVision's inspection libraries
- EasyImage
- EasyGauge
- EasyMatch
- EasyObject
- EasyColor

Main benefits

Neo Licensing System

Neo is the new Licensing System of Euresys. It is reliable, state-of-the-art, and is now available to store Open eVision and eGrabber licenses.

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Neo Dongles offer a sturdy hardware and provide the flexibility to be transferred from a computer to another.

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Specifications

Software

Host PC Operating System

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Remote connections

Remote connections are allowed using remote desktop, TeamViewer or any other similar software.

Virtual machines

Virtual machines are supported. Microsoft Hyper-V, Oracle VirtualBox and libvirt hypervisors have been successfully tested.

Only the Neo Licensing System is compatible with virtualization.

Minimum requirements:

2 GB RAM to run an Open eVision application

8 GB RAM to compile an Open eVision application

Between 100 MB and 2 GB free hard disk space for libraries, depending on selected options.

APIs

Supported programming languages:

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Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4014 Inspection Bundle for USB dongle

PC4064 Inspection Bundle for PAR dongle

PC4114 Inspection Bundle for board licensing

PC4164 Open Inspection Bundle for USB dongle

PC4214 Open Inspection Bundle for PAR dongle

PC4314 Open eVision Inspection Bundle

Included libraries

EasyColor

EasyGauge

EasyImage

EasyMatch

EasyObject

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

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- South Korea
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- Asia (other countries)
  Euresys Pte. Ltd.
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- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

12/18/2023

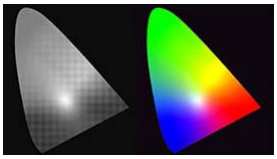
Datasheet

EasyColor

Color image analysis library

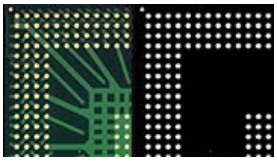
- Fast conversion of images between 11 color spaces
- Color segmentation: to identify objects based on their color
- Color verification: to verify the color of objects

Main benefits



Operation Principles

Although the RGB (red, green, blue) representation of color images is well suited for color reproduction (it is used by monitors and cameras), many other representations have been designed for various purposes. More particularly, the “”Intensity/Saturation/Hue”” color systems are well suited for machine vision applications. EasyColor supports several of them. They separate the achromatic (black and white) component (Intensity) from the chromatic components (Saturation and Hue) which are used to describe colors. This allows a more intuitive interpretation of colors and is very useful to segment colors while eliminating lighting effects. It is thus required, when doing color image processing, to convert the RGB images coming from the camera to another color space, such as LSH, ISH or YSH. EasyColor provides a set of optimized color space conversion functions.



Traditional color image processing functions

Also included in EasyColor are traditional color image processing functions (such as Bayer pattern conversion and color balance correction), as well as powerful color analysis functions, which allow the user to detect and classify color objects and defects. For example, color image segmentation allows you to decompose a color image in different regions by assigning a class to every pixel. Color image segmentation can be used in conjunction with EasyObject to perform blob analysis on the segmented regions. It is also possible to filter pixels by selecting ranges of values for each component, for example, selecting “”olive green”” pixels based on their hue only, with a loose discrimination on the intensity and saturation to eliminate surface and lighting effects.

EasyColor functions

- Color transformations: Lookup Tables (LUTs) for colorimetric systems conversion, gain / offset (color), color calibration or color balance (gamma pre-compensation, white balance)
- Merging and extraction of the color image components
- Pseudo-coloring
- Color classification for segmentation
- Handling of special color formats: YUV 422 decompression and Bayer pattern to RGB

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QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4004 EasyColor for USB dongle

PC4054 EasyColor for PAR dongle

PC4104 EasyColor for board licensing

PC4154 Open EasyColor for USB dongle

PC4204 Open EasyColor for PAR dongle

PC4304 Open eVision EasyColor

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

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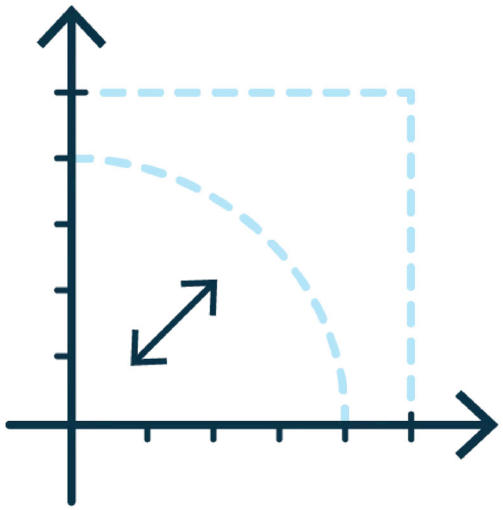
12/18/2023

Datasheet

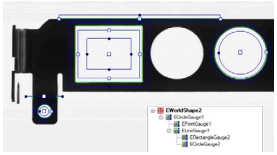
EasyGauge

Sub-pixel measurement & dimension control library



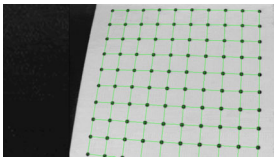
- Sub-pixel point location and edge fitting
- Highly accurate and robust
- Advanced and automatic calibration
- Multiple gauge models
- Measurement of position, orientation, size, curvature, distance
- Interaction through graphical interface

Main benefits



Gauge Grouping

EasyGauge supports grouping of the measurement gauges and lets these groups track the measured items in the image. These can freely translate and/or rotate while the probes are repositioned accordingly. Derived measurements such as distances between feature points can then be computed.



Advanced and Automatic Calibration

EasyGauge features advanced built-in calibration capabilities to transparently convert pixel measurements to physical units; this relieves the user of the need to convert coordinates. Non-square pixels and rotated coordinate axis are supported. EasyGauge also provides means to determine and correct perspective and optical distortion, with no performance loss.

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Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4009 EasyGauge for USB dongle

PC4059 EasyGauge for PAR dongle

PC4109 EasyGauge for board licensing

PC4159 Open EasyGauge for USB dongle

PC4209 Open EasyGauge for PAR dongle

PC4309 Open eVision EasyGauge

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

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12/18/2023

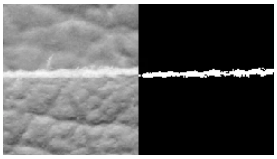
Datasheet

EasyImage

Image processing library

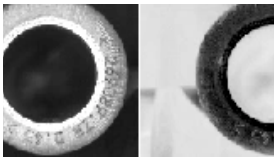
- Set of optimized fundamental image processing and analysis functions
- Convolution and morphology
- Geometric transformations
- Histogram computation and analysis
- Noise estimation and reduction
- HDR (High Dynamic Range) image fusion

Main benefits



EasyImage includes the following functions

- **Gain / Offset change**: Normalization, Uniformization, Lookup table mapping
- **Thresholding**: Automatic thresholding, Min residue, max entropy, isodata, Manual thresholding; Single threshold (absolute and relative), Double threshold, Histogram-based threshold
- **Arithmetic operations**: Addition, Subtraction, Multiplication, Division, Copy, Invert, Module, Shift
- HDR (High Dynamic Range) image fusion
- **Logical and bitwise operations**: AND, OR, XOR, NOT
- Pixel comparison, Minimum, maximum
- Histogram equalization
- **Linear filtering**: Edge detection (Laplacian, Gradient, Prewitt, Sobel, Roberts filters), Sharpening, Smoothing (Gaussian and uniform filters). Custom kernel filtering: Kernel creation and management functions.
- **Non-linear filtering**: Morphological operators (Erosion, Dilation, Opening, Closing, Thinning, Thickening, Top-hat filter, Hit-and-miss transform, Morphological distance), Median filter



Also includes the following functions

- **Geometric transformations**: Image registration (alignment), Horizontal and vertical mirroring, Translation, scaling and rotation with optional interpolation, LUT-based (un)warping
- Vector operations, Projection, Profile sampling (line segment, path, contour) and analysis
- **Statistics**: Measurement of Area, Binary moments, Weighted moments, Gravity center, Pixel count and pixel statistics, Minimum and maximum gray-level value, Average, variance and standard deviation
- Histogram computation and analysis
- Image focusing
- **Noise estimation and reduction**: Spatial noise reduction (Convolution, Median filters), Temporal noise reduction (Recursive average, Moving average, Average), Noise estimation (Root-mean-square noise, Signal-to-noise ratio)
- Elimination of the interlaced images artifacts by rebuilding or re-aligning fields
- **Feature point detectors**: Harris corner detector, Canny edge detector
- Other operations: Overlay, Scalar gradient

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QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4001 EasyImage for USB dongle

PC4051 EasyImage for PAR dongle

PC4101 EasyImage for board licensing

PC4151 Open EasyImage for USB dongle

PC4201 Open EasyImage for PAR dongle

PC4301 Open eVision EasyImage

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

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12/18/2023

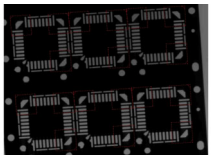
Datasheet

EasyMatch

Pattern matching library

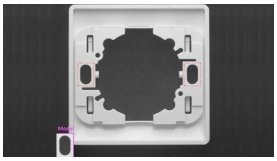
- Pattern matching using normalized correlation
- Sub-pixel accuracy
- Rotation and scaling support
- Detection of multiple pattern occurrences
- Support of gray scale and color images
- Support of "don't care" areas

Main benefits



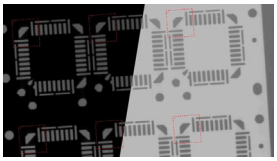
Multiple pattern occurences

EasyMatch is able to find several occurrences of a pattern, up to a user-defined number.



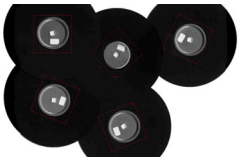
Standard, offset-normalized, gain-normalized and fully-normalized correlation

The correlation is computed on grey scale or color images. To cope with pattern lighting variations, pattern images are normalized. EasyMatch provides four normalization modes, depending on whether a grey-scale gain and/or offset compensation are used.



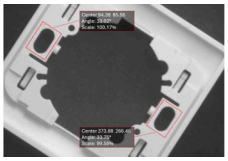
Normal, inverse or mixed contrast

Because of particular lighting effects, an object can appear with inverted contrast (white on black instead of black on white or conversely). Depending on the application, it can be useful to keep inverted instances or to disregard them. Three contrast modes are available: consider positive occurrences only, negative occurrences only or both.



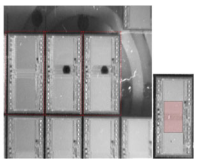
Translation, rotation and isotropic/anisotropic scaling

To find the best matches between the pattern and target image, the target is allowed to translate horizontally and vertically. Additionally, it can be allowed to rotate and/or to change its scale in the X and Y directions simultaneously or independently. The rotation angle and scale factors vary in a user-specified interval. All degrees of freedom can be combined at will.



Variable accuracy, up to sub-pixel level

The accuracy with which the pattern is measured can be chosen (the less accurate, the faster). A one tenth-of-a-pixel accuracy can be achieved.

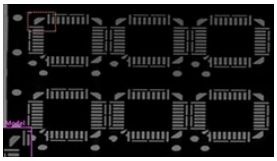


Don't care pixels

When the pattern cannot be inscribed in a rectangular ROI, the surrounding of the pattern can be ignored by setting the pixels values below a threshold level. These pixels will not take part in the matching process. The same feature can be used if parts of the template change from sample to sample.

Gray-level and color images

EasyMatch works with 8-bit gray-scale images as well as 24-bit RGB images.



Non-square pixels

When images are acquired with non-square pixels, rotated objects appear skewed. Taking the pixel aspect ratio into account can compensate for this effect.

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Neo ships with its own, dedicated, Neo License Manager, which comes in two flavours: an intuitive, easy to use, Graphical User Interface and a Command Line Interface that allows for easy automation of Neo licensing procedures.

All Open eVision libraries are available for Windows and Linux

- Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture
- Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Specifications

Software

Host PC Operating System

Open eVision is a set of 64-bit libraries that require an Intel compatible processor with the SSE4 instruction set or an ARMv8-A compatible processor.

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Remote connections

Remote connections are allowed using remote desktop, TeamViewer or any other similar software.

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Virtual machines are supported. Microsoft Hyper-V, Oracle VirtualBox and libvirt hypervisors have been successfully tested.

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Minimum requirements:

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8 GB RAM to compile an Open eVision application

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APIs

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Supported Integrated Development Environments:

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Microsoft Visual Studio 2019 (C++, C#, VB .NET, C++/CLI)

Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4003 EasyMatch for USB dongle

PC4053 EasyMatch for PAR dongle

PC4103 EasyMatch for board licensing

PC4153 Open EasyMatch for USB dongle

PC4203 Open EasyMatch for PAR dongle

PC4303 Open eVision EasyMatch

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

  Sensor to Image GmbH
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- China
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- Japan
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  Contact support : support.japan@euresys.com

- South Korea
  Euresys South Korea Liaison Office
  Contact support : support.korea@euresys.com

- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

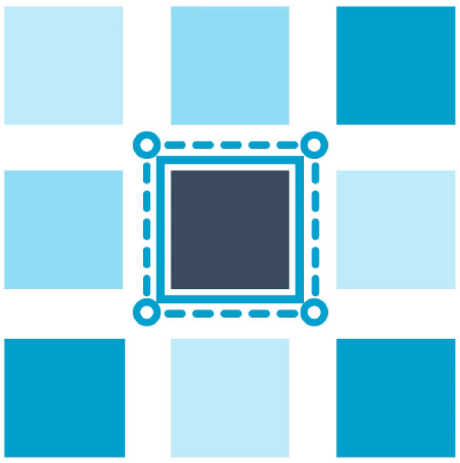
  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

12/18/2023

Datasheet

EasyObject

Blob analysis library

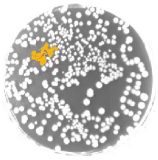


- Image segmentation based on the gray scale of connected objects
- Object labeling
- Geometric feature extraction
- Flexible Masks
- High performance, especially for large images and images with numerous objects

Main benefits

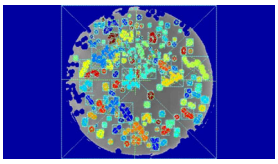
Flexible Masks

EasyObject supports the limitation of the blob analysis to complex- or disconnected-shape regions of the image thanks to the Flexible Masks that are available for the encoding functions. EasyImage can also generate Flexible Masks from an encoded image.



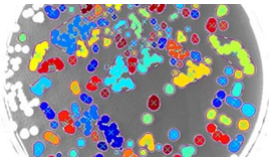
Functions

- Image Encoding:
  - Construction of the runs: Segmentation using Grayscale single threshold, Grayscale double threshold, Color single threshold, Color range threshold, Reference image, Image range, Labeled Image or Binary Image
  - Pixel aggregation
  - Object construction: aggregation of the runs into objects
  - Hole construction: aggregation of the runs into holes
  - Continuous mode for web inspection applications using line-scan cameras
- Object feature extraction (geometric parameters computation)
- Object selection and sorting according to any feature value



Object/blob features available

- Position: Limit (top, bottom, left, right), Gravity center (X and Y), Weighted gravity center (X and Y)
- Extent: Area (pixel count), Feret box (center X and Y, height, width with distinct orientation angles at 22, 45, 68 degrees), Bounding box (center X and Y, height, width), Minimum enclosing rectangle (angle, center X and Y, height, width)
- Starting point of the object contour (X and Y)
- Longest run
- Run count
- Object number (index)
- Statistics: Pixel gray-level value (average, deviation, variance, min and max)
- Ellipse of Inertia: Eccentricity of the ellipse of inertia, Ellipse, Second order geometric moments
- Convex hull



Graphic representation

The objects can be drawn onto the source image. The following blob features have a pre-set graphical representation:

- Objects
- Diagonals
- Bounding box
- Convex hull
- Ellipse
- Feret Box
- Feret box with an angle of 22°
- Feret box with an angle of 45°
- Feret box with an angle of 68°
- Gravity center
- Minimum enclosing rectangle
- Weighted gravity center

Neo Licensing System

Neo is the new Licensing System of Euresys. It is reliable, state-of-the-art, and is now available to store Open eVision and eGrabber licenses.

Neo allows you to choose where to activate your licenses, either on a Neo Dongle or in a Neo Software Container. You buy a license, you decide later.

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QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4002 EasyObject for USB dongle

PC4052 EasyObject for PAR dongle

PC4102 EasyObject for board licensing

PC4152 Open EasyObject for USB dongle

PC4202 Open EasyObject for PAR dongle

PC4302 Open eVision EasyObject

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  Contact support : support.japan@euresys.com

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  TKH Vision Experience Center
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2/26/2024

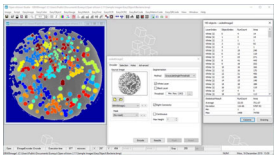
Datasheet

Open eVision Studio

Evaluation and prototyping application

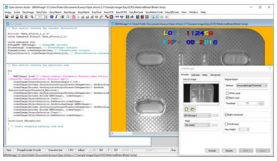
- Intuitive graphical user interface
- Live display of any Open eVision function
- Generate C++, C# and Visual Basic code
- Free of charge

Main benefits



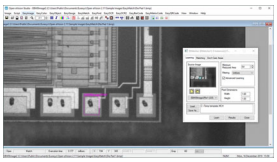
Open eVision Evaluation

Load your own images into Open eVision Studio and immediately see the result of any Open eVision function. No programming is required.



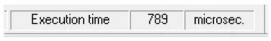
Code generation

Faster than reading the manuals! Any function called from Open eVision's menus and dialog boxes sees its corresponding C++, C# or Visual Basic code added to the script. Just copy the relevant parts to your application to include the corresponding functionality.



Template creation

Open eVision Studio includes functions to interactively create templates for EasyMatch and EasyFind, as well as manage EasyOCR and EasyOCR2 font databases.



Benchmarking

Open eVision Studio measures and displays the real execution time (on your machine) of any Open eVision's function.

Specifications

Software

Host PC Operating System

Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture

Minimum requirements:

- 8 GB RAM
- 400 MB free hard disk space

Related libraries

EasyColor

EasyImage

EasyFind

EasyMatch

EasyGauge

EasyObject

EasyBarCode

EasyQRCode

EasyMatrixCode

EasyOCR

EasyOCR2

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