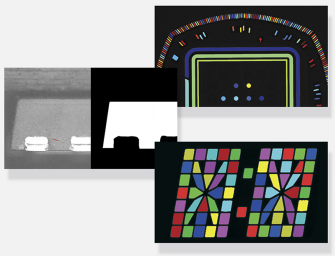
euresys
Empowering Computer Vision

EasyObject

Blob analysis library



At a Glance

- 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

Benefits

New in Open eVision 22.08

- EasyLocate Interest Point : New working mode (alternative to EasyLocate Axis Aligned Bounding Box) simplifying the annotation of the dataset and the configuration of the tools when all objects have the same size. A single click is enough to annotate an EasyLocate Interest Point object.
- EasyGauge : New Polygon Gauge in addition to Point, Line, Rectangle, Circle and Wedge gauges.
- Deep Learning tools now supporting GPU processing on NVIDIA Jetson.
- Faster compilation time with simplified C++ headers and reduced calling cost to the Open eVision API.

New in Open eVision 22.04

All Open eVision libraries are now also available for embedded ARM devices.

Open eVision Studio: Evaluation, prototyping and development tool

Open eVision Studio is the evaluation, prototyping and development tool of Open eVision. Its intuitive graphical user interface allows you to call and immediately see the result of any of eVision's2D image processing functions. A scripting functionality generates the corresponding code, which can then be copied and pasted into your application.

Open eVision Studio is free (when using Open eVision 2.0 and above) and does not require any license.

Just click on DOWNLOAD OPEN EVISION STUDIO and install Open eVision. Sample images, manuals and sample programs are included.

EasyObject Description

The EasyObject library handles image segmentation, i.e. the decomposition of images into separate objects, also called blobs.

Once the objects have been constructed, they can be handled as independent entities. Various geometric parameters or features, such as area, width, or ellipse of inertia, can be computed for each object.

Objects of interest can be selected by means of their position or of their computed features.

EasyObject also supports the inspection of holes in defined objects. Holes are managed as the objects themselves, benefiting from the same geometrical features. EasyObject manages the relationship between objects and holes, defining parent objects for holes.

Flexible Masks

EasyObject supports the restriction 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 at22, 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.
- Neo Dongles offer a sturdy hardware and provide the flexibility to be transferred from a computer to another.
- Neo Software Containers do not need any dedicated hardware, and instead are linked to the computer on which they have been activated.
- 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

- Windows 7 to Windows 10 x86 (32-bits) and x86-64 (64-bits)
- Windows 11 x86-64 (64-bits)
- Linux 64 bits (x86-64 and ARMv8-A) with a glibc version 2.18 or newer

Applications

Machine Vision for the Electronic Manufacturing Industry

- High speed image acquisition for AOI, 3D SPI, 3D lead/ball inspection machines.
- Very high resolution line-scan image acquisition for Flat Panel Display inspection and solar cell inspection

Machine Vision for the General Manufacturing Industries

- High frame rate image acquisition for inspection machines
- Line-scan image acquisition for surface inspection machines
- Line-scan image acquisition for textile inspection
- Presence / Absence check
- Surface analysis
- Object positioning for pick and place machines

Machine Vision for the Printing Industry

- High speed line-scan image acquisition for printing inspection machines

Video Acquisition and Recording

- High-frame-rate video acquisition for motion analysis and recording

Specifications

Software

Host PC Operating System	• Open eVision is a set of 32-bit and 64-bit libraries that require an Intel compatible processor with the SSE4 instruction set or an ARMv8-A compatible processor. • The Deep Learning Bundle is only available in the 64-bit Open eVision library. • Open eVision can be used on the following operating systems: – Windows 11 (64-bits) – Windows 10 (32- and 64-bits) – Windows 8 (32- and 64-bits) – Windows 7 (32- and 64-bits) – Linux 64 bits (x86-64 and ARMv8-A) with a glibc version greater or equal to 2.18 • Since Open eVision 2.6, discontinued support of: – Windows Vista 32-bits Service Pack 1 – Windows XP 32-bits Service Pack 3 – Windows Embedded Standard 2009 32-bits • Remote connections – Remote connections are allowed using remote desktop, TeamViewer or any other similar software. • Virtual machines – Linux virtual machines are supported. Microsoft Hyper-V and Oracle VirtualBox hypervisors have been successfully tested. – Windows virtual machines are not supported. • 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 Integrated Development Environments and Programming Languages: – Microsoft Visual Studio 2008 SP1 (C++, C#, VB .NET, C++/CLI) – Microsoft Visual Studio 2010 (C++, C#, VB .NET, C++/CLI) – Microsoft Visual Studio 2012 (C++, C#, VB .NET, C++/CLI) – Microsoft Visual Studio 2013 (C++, C#, VB .NET, C++/CLI) – Microsoft Visual Studio 2015 (C++, C#, VB .NET, C++/CLI) – Microsoft Visual Studio 2017 (C++, C#, VB .NET, C++/CLI) – 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 • Since Open eVision 2.5.1, discontinued support of: – Borland C++ Builder 6.0 update 4 (C++) – CodeGear Delphi 2009 (Object Pascal) – CodeGear C++ Builder 2009 (C++) – Microsoft Visual Studio 6.0 SP6 (C++, Basic) – ActiveX API • Since Open eVision 2.4.1, discontinued support of: – Embarcadero RAD Studio XE4 and XE5 (C++, Object Pascal, 32 bits only)

Ordering Information

Product code - Description	• 4002 - EasyObject for USB dongle • 4052 - EasyObject for PAR dongle • 4102 - EasyObject for board licensing • 4152 - Open EasyObject for USB dongle • 4202 - Open EasyObject for PAR dongle • 4252 - Open EasyObject for soft-based licensing • 4302 - Open eVision EasyObject
Optional accessories	• 6512 - eVision/Open eVision USB Dongle (empty) • 6513 - eVision/Open eVision Parallel Dongle (empty) • 6514 - Neo USB Dongle (empty)

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