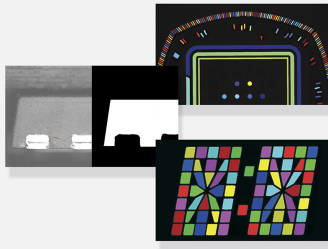# EasyObject

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 24.02

EasyFind : Significant speed increase, without any loss of accuracy.

EasyImage

- New Gabor filtering function to help with texture analysis and edge detection.
- New inverse circle warp function, providing conversion between polar and cartesian coordinates.

Easy: Improved off-screen rendering on all platforms.

Admin: Simplified version upgrade procedure with version numbers removed from filenames.

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's 2D 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.

New in Open eVision 23.12

Import of standard datasets into Deep Learning Studio

- Import of COCO Json dataset for EasyLocate or EasySegment Supervised

- Import of YOLO TXT annotations for EasyLocate

- Import of Pascal VOC XML annotations for EasyLocate

EasySpotDetector (Beta release, contact us for more information)

- A single API and license for the alignment of region of interest, surface defect detection (particles, scratches,…) and classification with a custom trained Deep Learning classifier.
- Realtime processing for inline surface inspection

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
- 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

Applications

Machine Vision for the General Manufacturing Industries
- Presence / Absence check
- Surface analysis
- Object positioning for pick and place machines

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. - Open eVision can be used on the following operating systems: - 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 - 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 Integrated Development Environments and Programming Languages:
	– 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

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
	• 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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