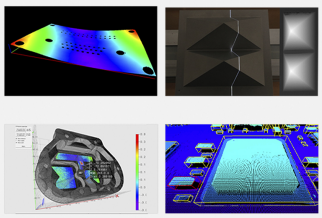
euresys
Empowering Computer Vision

Easy3D

3D image processing library



At a Glance

- Point cloud processing and management
- Flexible ZMap generation
- 3D processing functions for cropping, decimating, fitting and aligning point clouds
- Compatible with many 3D sensors
- Interactive 3D display with the 3D Viewer

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.
- The 3D viewer can now shade opaque rendering sources with the Eye-Dome-Lighting (EDL) algorithm.

Easy3D Description

Easy3D is the foundation library of Open eVision's 3D libraries. It contains a set of functions to manage 3D Depth Maps, Point Clouds and ZMap objects. Easy3D is required when using any Open eVision's 3D library and is provided when purchasing Easy3DLaserLine, Easy3DObject, Easy3DMatch or the 3D Bundle.

Point Cloud processing

After calibration, the 3D point cloud contains distortion-free data using a real-world 3D coordinate system. Process 3D point clouds using Easy3D functions such as coordinates transformation, point cloud cropping and decimation, plane finding and fitting or part alignment.

ZMap generation

A ZMap is the projection of a point cloud on a reference plane, where distances are stored as pixel gray scale values. ZMaps are distortion free, with a metric coordinate system. Easy3D provides functions to generate such ZMaps. More importantly, you can apply all Open eVision 2D processing functions to ZMaps: filtering and thresholding with EasyImage, blob analysis with EasyObject, sub-pixel measurement with EasyGauge, pattern matching with EasyFind and EasyMatch…

Compatibility with 3D sensors

The Easy3D library is able to import data from third-party 3D sensors from Automation Technology, Azure Kinect, Benano, IDS Ensenso, Intel Realsense, Lucid Helios, LMI Gocator, Mech-Mind, Photoneo PhoXi, Shenzhen SinceVision (SSZN), Zivid and others. Point Clouds and ZMaps are managed efficiently and allow 3D processing and analysis to be performed.

3D Viewer

Use the 3D Viewer class of Easy3D to create an interactive 3D display. The 3D Viewer can display point clouds and 3D objects. It uses the OpenGL interface and requires a compatible display device.

Photometric Stereo for 3D surface inspection

The Photometric Stereo function estimates the orientation and albedo of each point of a surface by acquiring several images of the same surface taken from a single viewpoint, but under illumination from different directions.

The method is suitable for the inspection of details (defects or information) present on the surface of objects that cannot be seen by a single camera-light pair and reveals small variations in surface curvature or texture.

It can be used as a preprocessing phase to other libraries, such as code reading (EasyMatrixCode, EasyQRCode or EasyBarcode), optical character recognition (EasyOCR), alignment (EasyMatch, EasyFind), measurement (EasyGauge) or defect detection (EasyObject or EasySegment).

Photometric Stereo is available in the Easy3D library.

Open eVision 3D Studio

The Open eVision 3D Studio application drastically simplifies the configuration of single and dual 3D laser line inspection systems using the Coaxlink Quad 3D-LLE frame grabber, as well as the Easy3D and Easy3DLaserLine libraries.

Open eVision 3D Studio is free and does not require any license.

Just click on DOWNLOAD OPEN EVISION 3D STUDIO and install Open eVision. Sample images, manuals and sample programs are included.

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.

Developed with the support of the DG06 Technology Development Department

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
- PCB inspection
- LED inspection
- Connector 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
- Checking dimensional accuracy
- Assembly inspection
- Object positioning for pick and place machines

Machine Vision for the Printing Industry

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

Machine Vision for the Food Inspection Industry

- Food inspection and sorting

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	• 4181 - Open Easy3D for USB dongle • 4231 - Open Easy3D for PAR dongle • 4281 - Open Easy3D for soft-based licensing • 4331 - Open eVision Easy3D
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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