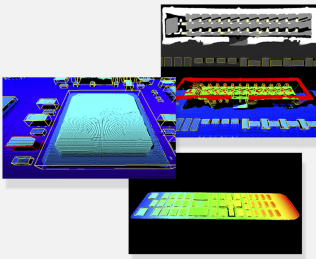# Easy3DObject

3D object extraction and measurement library

At a Glance

- Detection of 3D objects in point clouds or ZMaps
- Metric detection criteria
- Compatible with arbitrary regions
- Computation of precise 3D measurements, like size, orientation, area, volume…
- Automatic extraction of object local support plane
- 2D and 3D graphical display of the results
- Full-featured interactive demo application

Benefits

Easy3DObject Description

Easy3DObject is a library able to automatically extract and measure 3D objects from a Point Cloud or ZMap. Easy3D is required when using any Open eVision's 3D library and is provided when purchasing Easy3DLaserLine, Easy3DObject, Easy3DMatch or the 3D Bundle.

Detection of 3D objects in point cloud and ZMap

Easy3DObject uses an innovative algorithm to detect objects in Point Clouds or ZMaps. It is able to efficiently extract smal and large objects, whatever their shape.

Metric detection criteria

The 3D object detection algorithm uses several geometric criteria to focus only on the required objects. These criteria are the size (length, width and height), the angle (orientation and tilt), the aspect ratio, the area and the volume of the objects. These parameters are expressed in real-world coordinate units. Using these criteria, the user can limit the extraction to the objects relevant to the inspection.

Compatible with arbitrary regions

The arbitrary region feature of eVision (ERegion) can be used with Easy3DObject to refine the domain of extraction. Rectangles, circles, ellipses, polygons or any arbitrary regions are available as an optional parameter to the extraction.

Compute precise 3D measurements, such as size, orientation, area, volume…

For each object detected, Easy3DObject computes 3D geometric measurements. All measurements are expressed in real-world units (such as millimeters or microns). These values include the length, width and height of the object, the orientation and tilt angles, the area and the volume. These measurements can then be used to perform 3D inspection, for example by comparing the results with reference values.

Automatic extraction of object local supporting plane

For each object detected, Easy3DObject extracts the local supporting plane. It is then used as the reference for various calculations like height, top position or volume. Using only the area surrounding the object in this process makes Easy3DObject a powerful tool for the inspection of products with curved or non-flat support.

2D and 3D graphical display of the results

The resulting object list can be displayed in 2D and 3D graphical contexts. On an image, the objects can be shown with their bounding rectangle, average position or extracted pixels. On a 3D Viewer, the objects are displayed with their bounding boxes, planes or top positions. Display attributes like color or opacity are customizable.

Full featured interactive demo application

A demo application for Easy3DObject is provided with complete source code. Using that application, the user will be able to learn and experiment with all the features of the Easy3DObject library. Additionally, code snippets can be generated and integrated into their applications.

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)
- Linux x86-64 (64 bits) with a glibc version 2.18 or newer

Applications

Machine Vision for the Electronic Manufacturing Industry

- PCB inspection
- LED inspection
- Connector inspection

Machine Vision for the General Manufacturing Industries

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

Machine Vision for the Food Inspection Industry

- Food inspection and sorting

Specifications

Software

Host PC Operating System	• Open eVision is a set of 32-bit and 64-bit libraries that require a processor compatible with the SSE4 instruction set.
	• 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 10 (32- and 64-bits)
	  − Windows 8 (32- and 64-bits)
	  − Windows 7 (32- and 64-bits)
	  − Linux 64 bits (x86-64 only) 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:
	  − RAM: 8 GB
	  − Display size: 800 x 600. 1280 x 1024 recommended.
	  − Color depth: 16 bits. 32 bits recommended.
	  − 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)
	  − 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	• 4183 - Open Easy3DObject for USB dongle
	• 4233 - Open Easy3DObject for PAR dongle
	• 4283 - Open Easy3DObject for soft-based licensing
	• 4333 - Open eVision Easy3DObject
Optional accessories	• 6512 - eVision/Open eVision USB Dongle (empty)
	• 6513 - eVision/Open eVision Parallel Dongle (empty)
	• 6514 - Neo USB Dongle (empty)

EMEA

Euresys SA

Liège Science Park - Rue du Bois Saint-Jean, 20
4102 Seraing - Belgium

Phone: +32 4 367 72 88
Email: sales.europe@euresys.com

EMEA

Sensor to Image GmbH

Lechtorstrasse 20 -
86956 Schongau - Germany

Phone: +49 8861 2369 0
Email: sales.europe@euresys.com

AMERICA

Euresys Inc.

27132-A Paseo Espada - Suite 421
San Juan Capistrano, CA 92675 - United States

Phone: +1 949 743 0612
Email: sales.americas@euresys.com

ASIA

Euresys Pte. Ltd.

750A Chai Chee Road - #07-15 ESR BizPark @ Chai Chee
Singapore 469001 - Singapore

Phone: +65 6445 4800
Email: sales.asia@euresys.com

CHINA

Euresys Shanghai Liaison Office

Unit 802, Tower B, Greenland The Center - No.500 Yunjin Road, Xuhui District
200232 Shanghai - China
Euresys上海联络处
上海市徐汇区云锦路500号绿地汇中心B座802室
200232

Phone: +86 21 33686220
Email: sales.china@euresys.com

CHINA

Euresys Shenzhen Liaison Office

Room 1202 - Chinese Overseas Scholars Venture Building
518057 Shenzen - China
Euresys深圳联络处
深圳南山区留学生创业大厦1期1202
518057

Phone: +86 755 86506902
Email: sales.china@euresys.com

JAPAN

Euresys Japan K.K.

Expert Office Shinyokohama - Nisso Dai 18 Building, Shinyokohama 3-7-18, Kohoku
Yokohama 222-0033 - Japan
〒222−0033
神奈川県横浜市港北区新横浜3−7−18　日総第18ビル　エキスパートオフィス新横浜

Phone: +81 45 594 7259

Email: sales.japan@euresys.com

More at www.euresys.com