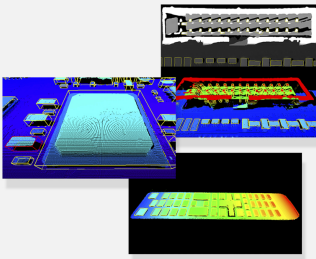


Easy3DObject

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 for all 3D developments and is included in the Easy3DObject license.

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 small 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.

Developed with the support of the DG06 Technology Development Department

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	<ul style="list-style-type: none">• Open eVision is a set of 32-bit and 64-bit libraries that require a processor compatible with the SSE2 instruction set.• The EasyDeepLearning library is only available in the 64-bit Open eVision library.• Open eVision can be used on the following operating systems:<ul style="list-style-type: none">– Windows 10 (32- and 64-bits)– Windows 8 (32- and 64-bits)– Windows 7 (32- and 64-bits)• Since Open eVision 2.6, discontinued support of:<ul style="list-style-type: none">– Windows Vista 32-bits Service Pack 1– Windows XP 32-bits Service Pack 3– Windows Embedded Standard 2009 32-bits• The Open eVision installer does not allow installation on virtual machines.• Minimum requirements:<ul style="list-style-type: none">– 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.
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APIs	<ul style="list-style-type: none">• Supported Integrated Development Environments and Programming Languages:<ul style="list-style-type: none">– Microsoft Visual Studio .NET 2003 SP1 (C++)– Microsoft Visual Studio 2005 SP1 (C++, C#, VB .NET, C++/CLI)– 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)• Since Open eVision 2.6, discontinued support of:<ul style="list-style-type: none">– Microsoft Visual Studio 6.0 SP6 (C++, Basic)– Borland C++ Builder 6.0 update 4 (C++)– CodeGear C++ Builder 2009 (C++)– CodeGear Delphi 2009 (Object Pascal)– Embarcadero RAD Studio XE4 (C++, Object Pascal)– Embarcadero RAD Studio XE5 (C++, Object Pascal)
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Ordering Information

Product code - Description	<ul style="list-style-type: none">• 4183 - Open Easy3DObject for USB dongle• 4233 - Open Easy3DObject for PAR dongle• 4283 - Open Easy3DObject for soft-based licensing
Optional accessories	<ul style="list-style-type: none">• 6512 - eVision/Open eVision USB Dongle (empty)• 6513 - eVision/Open eVision Parallel Dongle (empty)



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