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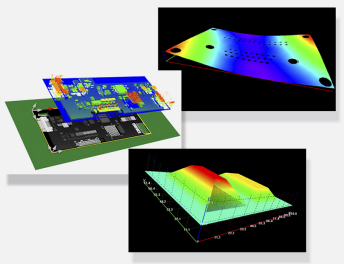
NEW

Easy3D

3D Inspection Library



At a Glance

- 3D Laser Line Extraction into a depth map
- Point cloud calibration and management
- ZMap generation and management
- Interactive 3D display with the 3D Viewer
- 3D processing functions

Benefits

Easy3D Description

Easy3D is a set of software tools enabling the development of 3D machine vision inspection applications.

Laser Line Extraction

Easy3D is able to generate a depth map from a series of images that contain a laser line projected on the inspected object. Each pixel of the resulting depth map contains the position of the laser line in the image.

Calibration

Some processing can be performed directly on a depth map. However, most 3D measurements need distortion-free data and metric representations, therefore calibrating the laser triangulation setup is required. Easy3D computes a calibration model applied to depth maps to transform them into calibrated 3D point clouds.

This calibration model is based on the depth map of a reference object, acquired using the laser triangulation setup that needs calibration.

Point Clouds

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.

3D Objects

A 3D object is a geometric representation of a 3D surface, defined by a triangle mesh connecting 3D points. Like point clouds, 3D objects contain metric coordinates, are generated from depth maps and can produce ZMaps.

ZMaps

A ZMap is the projection of a point cloud or a 3D object onto a reference plane, with the distance to that plane coded as grayscale values. 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…

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.

Easy 3D Studio

Open eVision also includes the Easy3D Studio application. This application provides an easy way to configure a complete 3D laser line inspection setup.

Developed with the support of the DG06 Technology Development Department

Applications

Machine Vision for the Electronic Manufacturing Industry

- PCB inspection
- LED 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 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: – 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: – 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: – 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 .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: – 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)

Ordering Information

Product code - Description	• 4181 - Open Easy3D for USB dongle • 4231 - Open Easy3D for PAR dongle • 4281 - Open Easy3D for soft-based licensing
Optional accessories	• 6512 - eVision/Open eVision USB Dongle (empty) • 6513 - eVision/Open eVision Parallel Dongle (empty)

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