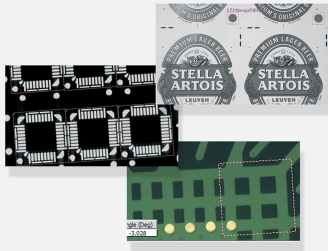


EasyMatch

Pattern Matching Library



At a Glance

- Pattern matching using normalized correlation
- Sub-pixel accuracy
- Rotation and scaling support
- Detection of multiple pattern occurrences
- Support of gray scale and color images
- Support of "don't care" areas

Benefits

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 functions. A scripting function 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 can be downloaded to evaluate the performance of Open eVision.

EasyMatch Description

EasyMatch is a gray-level and color pattern matching library. It lets you train the system on a reference pattern and afterwards locate its occurrences in other images.

This tool is very convenient when the position of a given part is unknown in the field of view, or if the presence of parts must be controlled. The library works by using normalized correlation method, i.e. measuring discrepancies between the pattern and the target image.

Multiple pattern occurrences

EasyMatch is able to find several occurrences of a pattern, up to a user-defined number.

Standard, offset-normalized, gain-normalized and fully-normalized correlation

The correlation is computed on grey scale or color images. To cope with pattern lighting variations, pattern images are normalized. EasyMatch provides four normalization modes, depending on whether a grey-scale gain and/or offset compensation are used.

Normal, inverse or mixed contrast

Because of particular lighting effects, an object can appear with inverted contrast (white on black instead of black on white or conversely). Depending on the application, it can be useful to keep inverted instances or to disregard them. Three contrast modes are available: consider positive occurrences only, negative occurrences only or both.

Translation, rotation and isotropic/anisotropic scaling

To find the best matches between the pattern and target image, the target is allowed to translate horizontally and vertically. Additionally, it can be allowed to rotate and/or to change its scale in the X and Y directions simultaneously or independently. The rotation angle and scale factors vary in a user-specified interval. All degrees of freedom can be combined at will.

Variable accuracy, up to sub-pixel level

The accuracy with which the pattern is measured can be chosen (the less accurate, the faster). A one tenth-of-a-pixel accuracy can be achieved.

Don't care pixels

When the pattern cannot be inscribed in a rectangular ROI, the surrounding of the pattern can be ignored by setting the pixels values below a threshold level. These pixels will not take part in the matching process. The same feature can be used if parts of the template change from sample to sample.

Gray-level and color images

EasyMatch works with 8-bit gray-scale images as well as 24-bit RGB images.

Non-square pixels

When images are acquired with non-square pixels, rotated objects appear skewed. Taking the pixel aspect ratio into account can compensate for this effect.

Choose the most suitable Licensing System

- Open eVision Dongle-based Licenses: Dongle-based Licenses offer the flexibility to be transferred from a PC to another. To purchase a Dongle-based License, select one of the Euresys dongles (USB or Parallel) plus the license(s) to be stored on this dongle. Licenses are delivered as activation codes, which are stored on the dongles.
- Open eVision Software-based Licenses: Software-based licenses do not require any dongle, they are linked to the PC on which they have been activated. Licenses are delivered as activation codes and can be managed online.

Applications

MACHINE VISION FOR THE ELECTRONIC MANUFACTURING INDUSTRY

Alignment

EasyFind and EasyMatch are able to quickly and reliably locate PCB and other fiducial marks in the image.

Pick and place

EasyFind and EasyMatch are able to quickly and reliably locate fiducial components in the image.

Wire bonding and Die bonding

EasyFind and EasyMatch are able to quickly and reliably locate fiducial marks in the image.

LED inspection

MACHINE VISION FOR THE GENERAL MANUFACTURING INDUSTRIES

Presence / Absence check

EasyImage gray-scale analysis functions are used for simple presence/absence checks

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. • Open eVision can be used on the following operating systems: – Windows 10, 8 and 7 (32- and 64-bits) – Windows Vista 32-bits Service Pack 1 – Windows XP 32-bits Service Pack 3 – Windows Server 2008 32-bits – Windows Server 2008 R2 64-bits – Windows Server 2003 32-bit Service Pack 1 – Windows Embedded Standard 2009 32-bits • The Open eVision installer does not allow installation on virtual machines. • Minimum requirements: – Display size: 800 x 600. 1280 x 1024 recommended. – Color depth: 16 bits. 32 bits recommended. – Between 20 MB and 300 MB free hard disk space for libraries, depending on selected options. – Between 60 MB and 400 MB free hard disk space for development tools, depending on selected options.
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APIs	Supported Integrated Development Environments and Programming Languages: • Microsoft Visual Studio 6.0 SP6 (C++, Basic) • 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) • 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	• 4003 - EasyMatch for USB dongle • 4053 - EasyMatch for PAR dongle • 4103 - EasyMatch for board licensing • 4153 - Open EasyMatch for USB dongle • 4203 - Open EasyMatch for PAR dongle • 4253 - Open EasyMatch for soft-based licensing
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