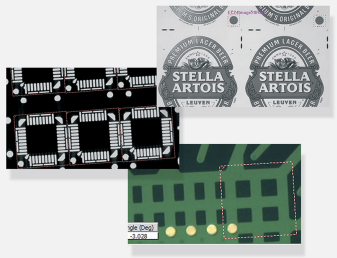
euresys
Empowering Computer Vision

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

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.

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's2D image processing functions. A scripting functionality 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 does not require any license.

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

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.

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.

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 Alignment
- Pick and place machines

- Wire bonding and Die bonding
- PCB inspection
- LED 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
- Presence / Absence check

Machine Vision for the Printing Industry

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

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	• 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 • 4303 - Open eVision EasyMatch
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

Email: sales.europe@euresys.com

EMEA

Sensor to Image GmbH

Lechtorstrasse 20
86956 Schongau - Germany

Email: sales.europe@euresys.com

AMERICA

Euresys Inc.

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

Email: sales.americas@euresys.com

ASIA

Euresys Pte. Ltd.

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

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

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

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

Email: sales.japan@euresys.com

More at www.euresys.com