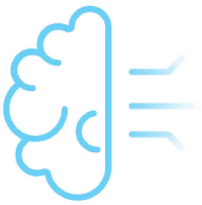
6/27/2024

Datasheet

Deep Learning Bundle

Convolutional Neural Network-based inspection libraries

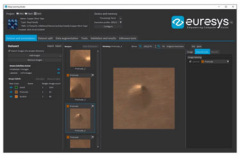


- Set of Deep Learning inspection libraries
- Optimized for machine vision applications
- Performs image classification, supervised or unsupervised segmentation and object localization
- Simple API
- Free Deep Learning Studio application for dataset creation, training and evaluation
- Supports data augmentation and masks
- Compatible with CPU and GPU processing

Main benefits

What Is Deep Learning ?

Neural Networks are computing systems inspired by the biological neural networks that constitute the human brain. Convolutional Neural Networks (CNN) are a class of deep, feed-forward artificial neural networks, most commonly applied to analyzing images. Deep Learning uses large CNNs to solve complex problems difficult or impossible to solve with so-called conventional computer vision algorithms. Deep Learning algorithms may be easier to use as they typically learn by example. They do not require the user to figure out how to classify or inspect parts. Instead, in an initial training phase, they learn just by being shown many images of the parts to be inspected. After successful training, they can be used to classify parts, or detect and segment defects.



Deep Learning Studio

Open eVision includes the free Deep Learning Studio application. This application assists the user during the creation of the dataset as well as the training and testing of the deep learning tool. For EasySegment, Deep Learning Studio integrates an annotation tool and can transform prediction into ground truth annotation. It also allows to graphically configure the tool to fit performance requirements. For example, after training, one can choose a tradeoff between a better defect detection rate or a better good detection rate.

Performance

Deep Learning generally requires significant amounts of processing power, especially during the learning phase. Deep Learning Bundle supports standard CPUs and automatically detects Nvidia CUDA-compatible GPUs in the PC. Using a single GPU typically accelerates the learning and the processing phases by a factor of 100.

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.

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All Open eVision libraries are available for Windows and Linux

- Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture
- Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Specifications

Software

Host PC Operating System

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Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Remote connections

Remote connections are allowed using remote desktop, TeamViewer or any other similar software.

Virtual machines

Virtual machines are supported. Microsoft Hyper-V, Oracle VirtualBox and libvirt hypervisors have been successfully tested.

Only the Neo Licensing System is compatible with virtualization.

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 programming languages:

The Open eVision libraries and tools support C++, Python and the programming languages compatible with the .NET Framework (C#, VB.NET)

C++ requirements: A compiler compatible with the C++ 11 standard is required to use Open eVision

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Supported Integrated Development Environments:

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Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4182 Open Deep Learning Bundle for USB dongle

PC4232 Open Deep Learning Bundle for PAR dongle

PC4332 Open eVision Deep Learning Bundle

Included libraries

EasyClassify

EasyLocate

EasySegment

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

Offices

- Europe, Middle East & Africa
  Euresys SA
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- South Korea
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- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

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  TKH Vision Experience Center
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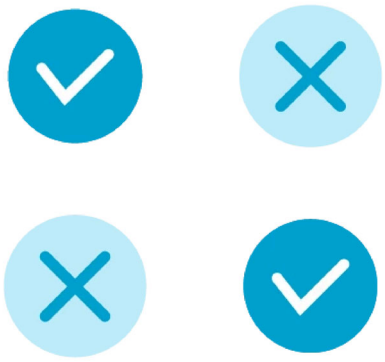
11/30/2023

Datasheet

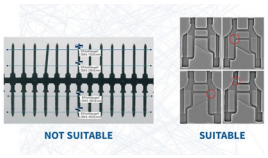
EasyClassify

Deep Learning classification library



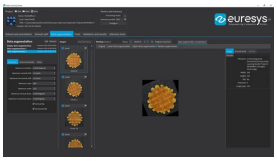
- Includes functions for classifier training and image classification
- Detects defective products
- Sorts products into various classes
- Supports data augmentation
- Compatible with CPU and GPU processing
- Deep Learning Studio for dataset creation, training and evaluation
- Only available as part of the Deep Learning Bundle

Main benefits



What is EasyClassify good for?

Deep Learning is generally not suitable for applications requiring precise measurement or gauging. It is also not recommended when some types of errors (such as false negative) are completely unacceptable. EasyClassify performs better than traditional machine vision when the defects are difficult to specify explicitly, for example, when the classification depends on complex shapes and textures at various scales and positions. Besides, the “learn by example” paradigm of Deep Learning can also reduce the development time of a computer vision process.



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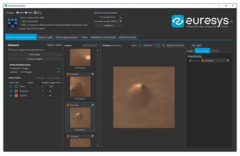

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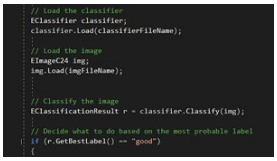

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Microsoft Visual Studio 2022 (C++, C#, VB .NET, C++/CLI)

QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4187 Open EasyClassify for USB dongle

PC4237 Open EasyClassify for PAR dongle

PC4337 Open eVision EasyClassify

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

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- South Korea
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12/18/2023

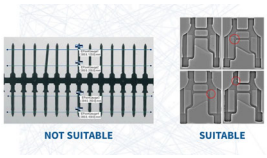
Datasheet

EasySegment

Deep Learning segmentation library

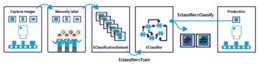
- Unsupervised mode: train only with “good” images to detect and segment anomalies and defects in new images
- Supervised mode: learn a model of the defects for better segmentation and detection precision
- Works with any image resolution
- Supports data augmentation and masks
- Compatible with CPU and GPU processing
- Includes the free Deep Learning Studio application for dataset creation, training and evaluation
- Only available as part of the Deep Learning Bundle

Main benefits



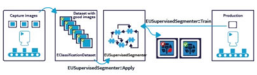
What is EasySegment good for?

Deep Learning is generally not suitable for applications requiring precise measurement or gauging. It is also not recommended when some types of errors (such as false negative) are completely unacceptable. The unsupervised mode of EasySegment is good for defect detection and segmentation tasks, especially when defectives samples are hard to come by. Deep Learning tools usually work very well with images of natural or manufactured objects that have complex surface patterns (e.g. wood, fabric, ...) that make the detection of defects by conventional machine vision algorithm very hard. Besides, the “learn by example” paradigm of Deep Learning can also reduce the development time of a computer vision process.



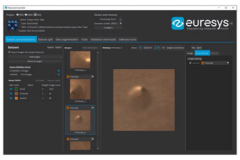
EasySegment Supervised mode

EasySegment is the segmentation tool of Deep Learning Bundle. EasySegment performs defect detection and segmentation. It identifies parts that contain defects, and precisely pinpoints where they are in the image. The supervised mode of EasySegment works by learning a model of what is a defect and what is a “good” part in an image. This is done by training with images annotated with the expected segmentation. Then, the tool can be used to detect and segment the defects in new images. The supervised mode of EasySegment achieves better precision and can segment more complex defects than the unsupervised mode thanks to the knowledge of the expected segmentation.



EasySegment Unsupervised mode

EasySegment is the segmentation tool of Deep Learning Bundle. EasySegment performs defect detection and segmentation. It identifies parts that contain defects, and precisely pinpoints where they are in the image. The unsupervised mode of EasySegment works by learning a model of what is a “good” sample (i.e. a sample without any defect). This is done by training it only with images of “good” samples. Then, the tool can be used to classify new images as good or defective and segment the defects from these images. By training only with images of good samples, the unsupervised mode of EasySegment is able to perform inspection even when the type of defect is not known beforehand or when defective samples are not readily available.



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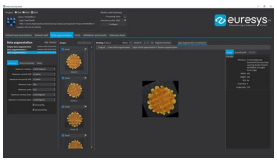

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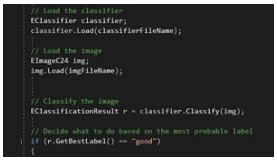

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Sample Dataset: Fabric Defect Detection

Our “Fabric” sample dataset shows how the unsupervised mode of EasySegment can be used to detect and segment defects in Fabric with only a few good samples for training and no knowledge about what kind of defects are expected. Moreover, the unsupervised mode of EasySegment can be used to ease the annotation of the expected segmentation required for the supervised mode by reviewing and importing the results of the unsupervised mode as ground truth.

Sample Dataset: Foreign Material Detection and Segmentation

Our “Coffee” sample dataset shows how the supervised mode of EasySegment can be used to efficiently detect and segment foreign materials on a production line, even when the foreign materials’ color and texture are very close to the product of interest.

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QtCreator 4.15 with Qt 5.12

Ordering Information

Product code - Description

PC4188 Open EasySegment for USB dongle

PC4238 Open EasySegment for PAR dongle

PC4338 Open eVision EasySegment

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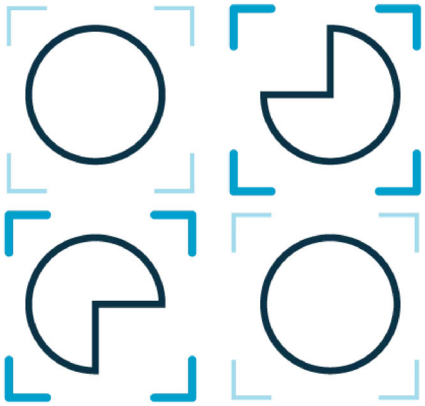
EasyLocate

Deep Learning localization and classification library



- Localization and identification of objects/products/defects
- Counting of objects
- Axis Aligned Bounding Boxes
- Interest Point
- Supports data augmentation and masks
- Compatible with CPU and GPU processing
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- Only available as part of the Deep Learning Bundle

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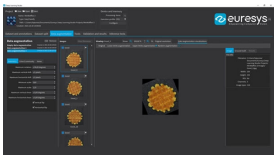

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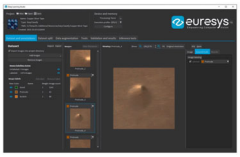

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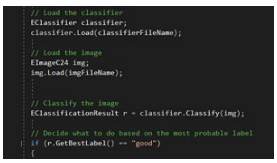


```
// Load the classifier
EClassifier classifier;
classifier.Load(classifierFileName);

// Load the image
EImageC24 img;
img.Load(imgFileName);

// Classify the image
EClassificationResult r = classifier.Classify(img);

// Decide what to do based on the most probable label
if (r.GetBestLabel() == "good")
{
```

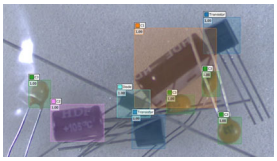
Why Choose Open eVision’s Deep Learning Bundle?

- Deep Learning Bundle has been tailored, parametrized and optimized for analyzing images, particularly for machine vision applications.
- Deep Learning Bundle has a simple API and the user can benefit from the power of deep learning technologies with only a few lines of code.
- Try before you buy: Deep Learning Bundle comes with the free Deep Learning Studio training and evaluation application.

EasyClassify, EasySegment and EasyLocate cannot be purchased separately. They are only available as part of the Deep Learning Bundle.
Download and evaluate Deep Learning Bundle using Deep Learning Studio today, and feel free to call Euresys’ support should you have any question.

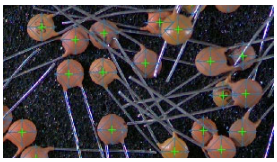
Performance

Deep Learning generally requires significant amounts of processing power, especially during the learning phase. Deep Learning Bundle supports standard CPUs and automatically detects Nvidia CUDA-compatible GPUs in the PC. Using a single GPU typically accelerates the learning and the processing phases by a factor of 100.



Sample Dataset: Electronic components

Our “Electronic Component” dataset shows how EasyLocate Bounding Box is able to reliably detect and count different kinds of standard electronic components stored in bulk inside plastic bags, in spite of the poor lighting conditions.



Sample Dataset: Ceramic Capacitor

Our “Ceramic Capacitor” dataset shows how EasyLocate Interest Point is able to reliably detect and count a lot of ceramic capacitors that are overlapping or touching each other.

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

- Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture
- Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Other benefits

What Is Deep Learning ?

Neural Networks are computing systems inspired by the biological neural networks that constitute the human brain. Convolutional Neural Networks (CNN) are a class of deep, feed-forward artificial neural networks, most commonly applied to analyzing images. Deep Learning uses large CNNs to solve complex problems difficult or impossible to solve with so-called conventional computer vision algorithms. Deep Learning algorithms may be easier to use as they typically learn by example. They do not require the user to figure out how to classify or inspect parts. Instead, in an initial training phase, they learn just by being shown many images of the parts to be inspected. After successful training, they can be used to classify parts, or detect and segment defects.

Specifications

Software

Host PC Operating System

Open eVision is a set of 64-bit libraries that require an Intel compatible processor with the SSE4 instruction set or an ARMv8-A compatible processor.

Open eVision can be used on the following operating systems:

Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture

Linux for x86-64 (64-bit) and ARMv8-A (64-bit) processor architectures with a glibc version greater or equal to 2.18

Remote connections

Remote connections are allowed using remote desktop, TeamViewer or any other similar software.

Virtual machines

Virtual machines are supported. Microsoft Hyper-V, Oracle VirtualBox and libvirt hypervisors have been successfully tested.

Only the Neo Licensing System is compatible with virtualization.

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 programming languages:

The Open eVision libraries and tools support C++, Python and the programming languages compatible with the .NET Framework (C#, VB.NET)

C++ requirements: A compiler compatible with the C++ 11 standard is required to use Open eVision

Python requirements: Python 3.11 or later is required to use the Python bindings for Open eVision

.NET requirements: .NET Framework versions 2.0 to 4.8 are supported

Supported Integrated Development Environments:

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

Ordering Information

Product code - Description

PC4189 Open EasyLocate for USB dongle

PC4239 Open EasyLocate for PAR dongle

PC4339 Open eVision EasyLocate

Included libraries

EasySegment

Related products

PC6512 eVision/Open eVision USB Dongle (empty)

PC6513 eVision/Open eVision Parallel Dongle (empty)

PC6514 Neo USB Dongle (empty)

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

  Sensor to Image GmbH
  Contact support : support.europe@euresys.com

- China
  Euresys Shanghai Liaison Office
  Contact support : support.china@euresys.com

  Euresys Shenzhen Liaison Office
  Contact support : support.china@euresys.com

- Japan
  Euresys Japan K.K.
  Contact support : support.japan@euresys.com

- South Korea
  Euresys South Korea Liaison Office
  Contact support : support.korea@euresys.com

- Asia (other countries)
  Euresys Pte. Ltd.
  Contact support : support.asia@euresys.com

- North, Central & South America
  Euresys Inc.
  Contact support : support.usa@euresys.com

  TKH Vision Experience Center
  Contact support : support.usa@euresys.com

2/26/2024

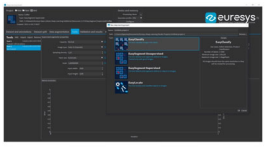
Datasheet

Open eVision Deep Learning Studio

Deep Learning training and evaluation application

- Ease the evaluation of Open eVision's Deep Learning tools
- Dataset creation and image annotation
- Create and configure dataset splits to decide how your images are used
- Manage the data augmentation transformations
- Train your tools in succession thanks to the training queue
- Validation and analysis of the results of the trained tools
- Available on Windows and Linux
- Free of charge

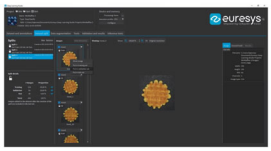
Main benefits



Deep Learning projects

A Deep Learning Studio project manages your dataset and the Deep Learning tools you created. A project is associated with one the Deep Learning tool (EasyClassify, EasySegment Unsupervised, EasySegment Supervised or EasyLocate) and supports all their features.

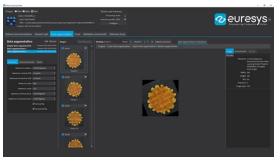
Within a project, you can create as many tools as you want. It allows you to easily experiment with the parameters of the tools, different split of the dataset, or data augmentation settings.



Control how your images are used

Deep Learning Studio allows you to split your dataset into training, validation, and test sets. You can create multiple dataset splits to experiment and check the performance of tools trained with different set of images.

You can create dataset splits at random or manually select the set of each image.

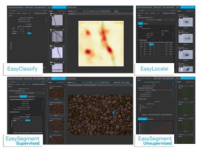


Data augmentation

The rich data augmentation capabilities of EasyClassify, EasySegment, and EasyLocate are available in Deep Learning Studio. Tune and visualize the geometric, color, and noise data augmentations. You can create different set of data augmentation settings to experiment how it influence your results.

Configure and train your tools

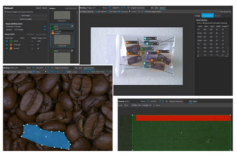
The Tools tab allows you to configure and train your tools. Operating on CPU or GPU, the training can be stopped and restarted at any time. You can launch as many training as you want thanks to the processing queue. The training and inference operations will be queued and processed one after the other.



Validation and result analysis

The validation process is customized for each library to allow you to get the most out of your data. A comprehensive set of metrics, tables, and/or graphs is available to analyze and explore the results of the training process.

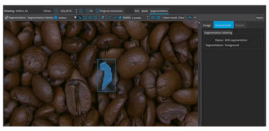
Tables and confusion matrixes allow you to filter your results to understand the strengths and weaknesses of the trained models. Score histograms and ROI curves are useful to select a threshold and adapt the trained models to your needs.



Annotate your dataset

Deep Learning Studio integrates annotation tools adapted to each library. For classification and unsupervised segmentation, you can quickly assign label to each image. For supervised segmentation, the segmentation editor allows you to draw the ground truth segmentation. For localisation, the object editor allows you to quickly draw the bounding box around each of your objects.

The image editor also allows you to select a region of interest and mask parts of your image.



New Assisted Segmentation Tool

Assisted segmentation tool to ease and speed up annotation.

Specifications

Software

Host PC Operating System

Microsoft Windows 11, 10, 8.1, 7 for x86-64 (64-bit) processor architecture

Linux for x86-64 (64-bit) processor architectures

Minimum requirements:

- 8 GB RAM
- 400 MB free hard disk space

Related libraries

EasyClassify

EasyLocate

EasySegment

Offices

- Europe, Middle East & Africa
  Euresys SA
  Contact support : support.europe@euresys.com

  Sensor to Image GmbH
  Contact support : support.europe@euresys.com

- China
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  Contact support : support.china@euresys.com

  Euresys Shenzhen Liaison Office
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  Euresys South Korea Liaison Office
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  Contact support : support.asia@euresys.com

- North, Central & South America
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  TKH Vision Experience Center
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