

Machine Learning Vision

Practice-oriented introduction to the basics of artificial intelligence

FESTO



Highlights

- Get to know the basics of AI / ML
- Optical quality inspection as an application scenario
- Collect, analyze, and use relevant data
- Perform realistic experiments
- Assess the potential and risks of AI / ML
- Can be used as a workstation module or integrated in CP Lab and CP Factory

In today's world, artificial intelligence (AI) is being used in numerous areas. For example, spam filters sort out harmful emails, search engines look for the best results and even the latest generation of smartphones usually have various AI algorithms integrated.

The same applies to industrial practice, in which AI methods are also necessary. Examples include predictive maintenance based on the evaluation of machine data and the saving of resources through data-supported process optimization.

Machine Learning (ML), a sub-discipline of AI, has proven to be particularly promising in the analysis of data.

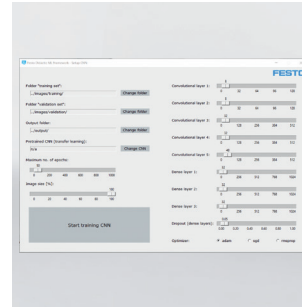
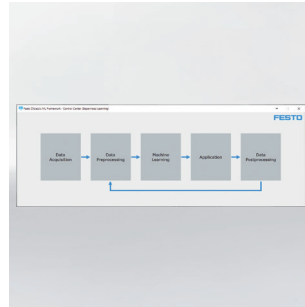
Due to the enormous computing power of today's computers, it is possible to classify and analyze huge amounts of data and to generate corresponding business benefits based on the results.

According to all forecasts, the share of intelligent software within modern production systems will continue to increase in upcoming years. Therefore, well-founded training, further education and training in the field of AI or ML are the key factors to master and profitably apply such complex systems in the future.

Immerse yourself in this exciting world with **Machine Learning Vision**.

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Hardware

Both the camera module and external lighting are based on industrial components and can be mounted and controlled individually in their position within the module, so you can switch flexibly and quickly between different test setups.

Learn about machine learning approaches in the field of optical quality inspection: where can artificial intelligence or machine learning play out its specific advantages in comparison to classical methods? How robust are the various algorithms when the lighting situation or even the position of the camera changes? What added value is created by “training” instead of “programming”?

The computer hardware is optimized and provided for the use of AI methods as well as the prepared examples which enable the experiments to be performed within a very short time!

Experiments

The workbook provides an introduction to artificial intelligence and machine learning and explains the most common terms and procedures before focusing on neural networks.

Using the included learning software, the necessary operations in the field of optical quality inspection with neural networks are played through data acquisition and preparation, selection of a suitable neural network structure, training, testing, and optimization of the network.

The software clearly guides you through the individual steps, whereby the experiments can also be carried out on the basis of prepared data without any programming knowledge at all.

The achieved results are always compared and evaluated with the corresponding “classical” image processing methods.

Flexibility

Provided learning software is based on Python, the programming language widely used in the field of artificial intelligence and machine learning and can be used regardless of the platform.

Due to the open source code, an adaptation of the learning software to other camera systems or advanced problems such as gesture and face recognition is easily possible.

The camera module can be used as an independent workplace module but can also be integrated into existing CP Lab or CP Factory learning factories.

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