ZEBRA
CAPTURE YOUR EDGE

Automation Distribution

Zebra Aurora™ Deep Learning

TO FURTHER ENHANCE SOLUTION QUALITY

Zebra Aurora™ Vision Deep Learning is an add-on product that offers a complete set of industrial-quality deep learning tools that can be used to solve problems that are far too complex for traditional machine vision algorithms.

Breakthrough Technology for Machine Vision Applications

Zebra Aurora™ Deep Learning offers breakthrough technology for machine vision applications. Designed as an add-on product, it further enhances the already impressive outputs of Aurora™ Vision Studio and Aurora™ Vision Library software with a set of industrial-quality deep learning-based tools, including optical character recognition (OCR) and features & anomaly detection.

In Aurora™ Deep Learning, advanced deep learning capabilities recognize the way imaging is used in more unusual vision applications – and evolve accordingly.

Seven ready-to-use tools, which are trained with 20-50 sample images, can quickly be used to detect objects, defects or features automatically. Internally, this software uses large neural networks designed and optimized by our research team for use in industrial vision systems.

With use cases across multiple industry verticals, this software enables solutions for complex machine vision problems that were previously impossible to achieve with traditional algorithms and approaches. Now, for example, machines and manual operators are able to use it to find complex and irregular surface defects or accurately read blurred, poorly lit, or damaged characters printed on glossy surfaces of product packaging.

FURTHER OPTIMIZE MACHINE VISION SOLUTIONS

Promote the benefits of deploying Aurora™ Vision Deep Learning to further optimize your customers' machine vision capabilities. This add-on software uses a set of advanced deep learning-based tools to help improve the quality and operational efficiency of existing machine vision solutions.

EVOLVE WITH REAL-WORLD LEARNING

Aurora™ Deep Learning enables industrial image analysis applications to employ a deep learning model trained using a set of real-world examples. Just 20-30 image samples can help existing machine vision solutions detect objects, defects, or features automatically, as well as identify point location and instance segmentation.

COMPREHENSIVE RANGE OF USE CASES

Aurora™ Deep Learning can be used for a wide variety of uses cases. These range from identifying different parts, surface defects, and correct processes in pick and place industrial applications, for example to rejecting poorly presented sushi boxes in retail settings and helping to identify potential bone fractures in X-ray images.

Why Choose Zebra Aurora™ Deep Learning?

- Use it with Aurora™ Vision Studio to get a complete graphical environment solution for model training, so you can quickly design and deploy modern machine vision applications.
- There is no programming – simply load your images, add labels and click 'Train'.
- Runs very fast on both GPU and CPU, and further performance optimization can be achieved with the use of industrial inference engines.

Key Features

Learns from few samples

Typical applications require between 20 and 50 images for training. The more the better, but our software internally learns key characteristics from limited training set and then generates thousands of new artificial samples for effective training.

Works on GPU and CPU

A modern GPU is required for effective training. At production, you can use either GPU or CPU. GPU will typically be 3-10 times faster (with the exception of Object Classification which is equally fast on CPU).

The highest performance

Typical training time on a GPU is 5-15 minutes. Inference time varies depending on the tool and hardware between 5 and 100 ms per image.

Deep Learning vs Traditional Machine Vision

Deep Learning is a new reliable solution for machine vision problems that could not have been solved before. There are, however, applications that can still only be realized with traditional methods.

How do you know which approach is better? Here's a quick guide:

Deep Learning

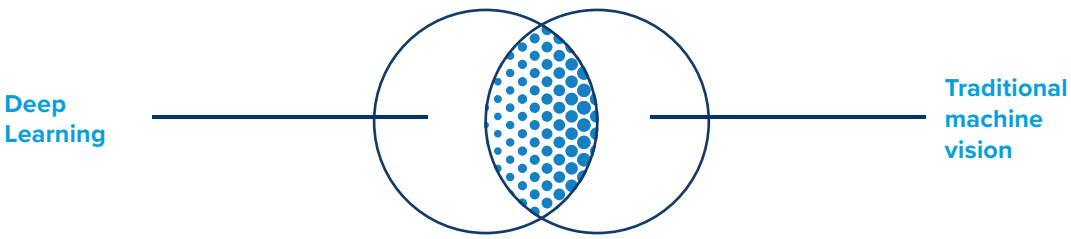
Typical applications:
- Surface inspection (cracks, scratches)
- Food, plant, wood inspection
- Plastics, injection moulding
- Textile inspection
- Medical imaging

Typical characteristics:
- Deformable objects
- Variable orientation
- Customer provides vague specifications with examples of good and bad parts
- Reliability: 99%

Traditional machine vision

Typical applications:
- Dimensional measurements
- Code reading
- Presence or absence checking
- Location of fiducials on PCB
- Print inspection

Typical characterisitics:
- Rigid objects
- Fixed orientation
- Customer provides formal specifications with tolerances
- Reliability: 100%



Explore the Zebra Aurora™ Vision Portfolio

Zebra is now a leading provider of user-friendly machine vision software for industrial image analysis. Our comprehensive Aurora™ Vision portfolio of graphical software helps you quickly and easily create powerful, custom machine vision applications.

Accelerate your Machine Vision Application Development

These world-class software products offer state-of-the-art, industrial reliability, quality, and speed. They have been used by machine builders, vision system integrators, robotic designers, and industrial end-users worldwide to enable rapid development of vision applications in verticals ranging from food production and retail to agriculture and healthcare.

Ready-made tools for dataflow and comprehensive image analysis filters are all hardware agnostic – to suit your customers' specific needs. They enable your engineers to quickly and easily construct powerful, customized machine vision applications to augment your operations.

Zebra **Aurora**™ **Vision** Studio

Zebra **Aurora**™ **Vision** Library

Zebra **Aurora**™ Deep Learning

To find out more, visit **zebra.com/aurora-for-oem**

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