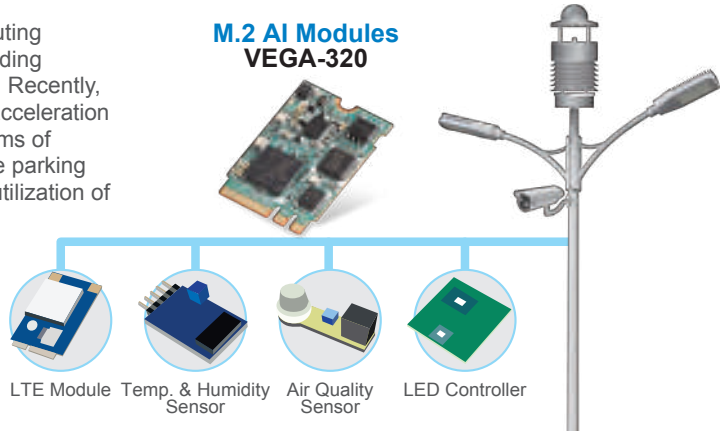
Application Stories

AI-Powered Smart Street Lights

Cities are illuminated by thousands of street lights that help drivers and pedestrians find their way home safely. Equipped with AI technology, street lights can be used to not only light up roads, but also support city services such as air quality, humidity, and temperature monitoring, as well as traffic and parking management.

Solution

The customer had already implemented Advantech's edge computing platform to serve as a gateway computer for collecting data, including temperature and humidity levels, to facilitate operational analysis. Recently, the platform was upgraded with Advantech's VEGA-320 edge AI acceleration modules embedded into the cameras for analyzing multiple streams of video data and handling real-time tasks such as locating available parking spaces. The customer estimated that this solution increases the utilization of roadside parking by at least 10% to 15%.



Key Benefit

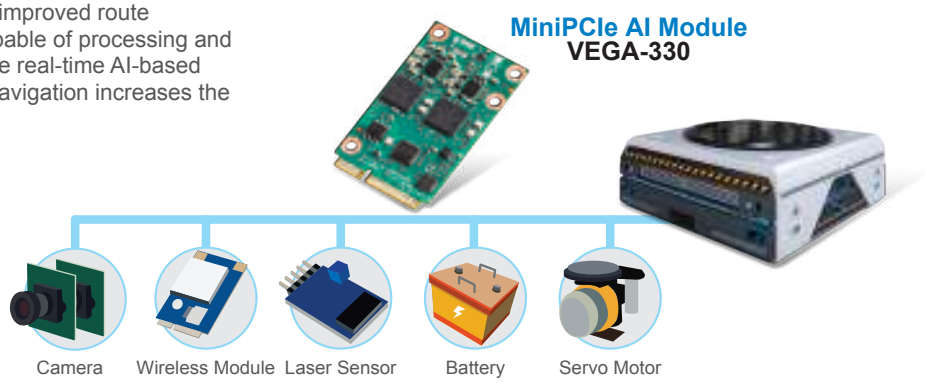
- Compact, low-power design with minimal installation effort
- Video analysis at the edge for instant response
- Saves bandwidth resources and costs

AI-Based AGV Navigation

Automated guided vehicles (AGV) are used to transport and handle goods predictably and reliably. With the integration of AI-based navigation, the optimal route is determined in real time, effectively increasing the runtime efficiency of AGVs for faster and smarter operations.

Solution

For vision-guided AGVs equipped with cameras, Advantech's VEGA-330 edge AI acceleration mini-PCIe module acts as a vision analytics engine, optimizing image processing and local inference for improved route planning and collision avoidance. This module is capable of processing and analyzing images captured by the camera to facilitate real-time AI-based navigation. By optimizing route planning, AI-based navigation increases the AGV runtime efficiency by up to 20%.



Key Benefit

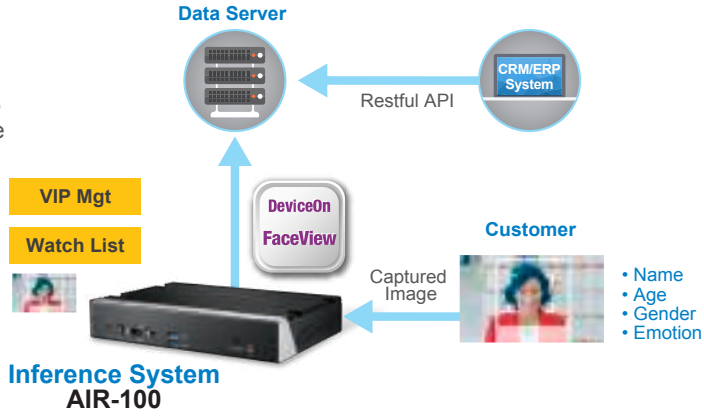
- Compact design with standard interface for easy integration
- Low power consumption extends the battery life
- Enables AI-based vision-guided navigation

AI Facial Recognition for Retail

The accuracy of facial recognition algorithms has improved significantly in the past few years. AI facial recognition can help retailers proactively prevent shoplifting and enhance customer service.

Solution

The company required a hardware and software integrated solution to enhance its shoplifting prevention and customer service via AI facial recognition. The AIR-100 inference system integrated with FaceView can detect customers' gender, age, and mood in real-time with 99.85% accuracy rating, enabling further analysis and precision marketing. The solution can also identify VIP customers or people with a shoplifting record, and send instant notifications to staff.



Key Benefit

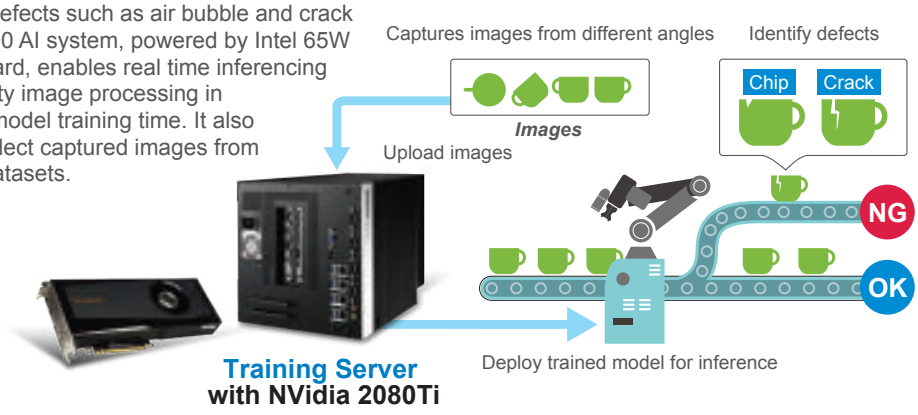
- High recognition accuracy
- Plug & play functionality, no training required
- Provides functional APIs for easy integration

Robotic AOI Defect Inspection

Manufacturing quality controls have long relied on visual inspection. Traditional machine vision systems may fail to distinguish defects due to the variability and deviation between visually similar parts. By leveraging AI deep learning technology, this problem can be overcome and overall detection accuracy improved

Solution

Our customer is a robotic visual equipment builder. Their defect inspection solution combines robotic arms with AI capability to detect defects such as air bubble and crack among enamel coated products. Advantech AIR-300 AI system, powered by Intel 65W Core i7 quad core processor and a NVIDIA GPU card, enables real time inferencing and continuous training. It guarantees a high density image processing in real time and parallel computation to accelerating model training time. It also provide high bandwidth and storage capacity to collect captured images from multiple product lines and store massive training datasets.



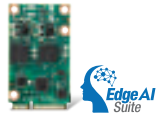
Key Benefit

- Intel® Core™ i7 quad-core processor with NVidia 2080Ti GPU card
- Four GbE ports offer sufficient bandwidth
- Four 2.5" SATA III drive bays offer 20TB storage capacity

Product Selection Guide

AI Acceleration Modules

VEGA-300 Series


	VEGA-320	VEGA-330	VEGA-340
SoC	1 x Myriad X MA2485	1/2 x Myriad X MA2485	4/8 x Myriad X MA2485
Form Factor	M.2 2230 (Key A+E)	Full-size mini PCIe	Low-profile PCIe x 4
Dimensions	22 x 30 x 3.63 mm	30 x 50.95 x 4.86 mm	171.1 x 68.9 mm
Signal Interface	PCIe x1, USB 2.0	PCIe x1, USB 2.0	PCIe x4, Gen 2
Operating Temperature	-20 ~ 60 ℃	-20 ~ 55 ℃	-20 ~ 60 ℃
Power Consumption	3.8W	3.8W/7.6W	16.8W/28W
Driver Support	Windows 10 Enterprise(64bit), Ubuntu 16.04.3 LTS(64 bit), CentOS 7.4(64 bit)		Windows 10 Enterprise(64 bit), Ubuntu 18.04. LTS(64-bit)

Edge AI Inference Systems

AIR-100/200/300




	AIR-100	AIR-101	AIR-200	AIR-300
Processor	Intel® Atom® x7-E3950	Intel® Atom® x5-E3940	Intel® Core™ i5-6442EQ	Intel® Xeon® E3/6th, 7th Gen. Core™ i3/i5/i7
Memory	4GB DDR3L installed	8GB DDR3L installed	8GB DDR4 installed	DDR4 SODIMM (up to 32GB)
Inference Engine	VEGA-320	VEGA-330	VEGA-330	NVidia 2080Ti GPU card (optional)
Display	2 x HDMI 1.4, 2 x HDMI 2.0	2 x HDMI 1.4	1 x VGA, 1x HDMI 1.4	1 x VGA, 1x HDMI 2.0
Expansion	1 x mini PCIe	1 x M.2 2230 E key	1 x mini PCIe 1 x M.2 2230 E key	1 x PCIe x16, 1 x M.2 2230 E key, 2 x mini PCIe
Storage	1 x 2.5” SSD (64GB)	1 x SATA Slim SSD (64GB)	1 x 2.5” SSD (64GB)	2 x 2.5” SATA III drive bays
Operating System	Win10 IoT 2019 (64bit)	Win10 IoT LTSC (64bit)	Win 10 IoT Enterprise 2019 (64 bit)	Win10 IoT LTSB (64bit)
Cooling	Passive, fanless	Passive, fanless	Passive, fanless	Active, with fan
Power	19 V_{DC}	12~28 V_{DC}	12~24 V_{DC}	100-240 V_{AC}
Operating Temperature	0 ~ 50 ℃	-20 ~ 55 ℃	0 ~ 60 ℃	0 ~ 50 ℃