Edge AI Solutions
Empower your AI Business at the Edge
Empower your AI Business at the Edge

In the current environment, the development and deployment of Edge AI and IoT on a large scale is a major challenge, especially in industrial environments. This is exactly what Advantech aims to solve. Advantech Edge AI solutions are powered by NVIDIA Jetson and RTX hardware and software to help accelerate AI deployment across industries such as manufacturing, transportation, retail and smart city development.

According to the latest forecast by Gartner, by 2027, machine learning in the form of deep learning will be included in over 65% of edge use cases.

DeviceOn for Edge AI
- Inference performance optimization
- Container & OTA deployment
- Large-scale mgmt. & remote monitoring

FaceView
- SDK integrated, UI/ API ready
- Up to 99.7% precision rate
- Ideal for surveillance and access control

ROS Suite
- A complete package with everything included
- Integrated SDK/Tool/API
- Cross-platform support: X86 and Arm
Edge AI Acceleration Cards
The VEGA-300 series provides low-power plug-in modules to easily accelerate AI inference on edge devices using Movidius VPUs.

- Plug and Play
- Up to 32 TOPs
- Power Efficient

Compact AI Box
Powered by NVIDIA Jetson family, AIR Edge AI Systems deliver scalable AI performance and ready-to-use software integrated in a compact form factor.

- Compact Size
- Up to 275 TOPS
- Rugged Design

High-Performance AI System
AIR High-Performance AI Systems support up to two RTX GPU cards for extreme AI deep learning performance or efficient retraining on a large scale.

- Extreme Performance
- Multiple GPUs
- Server Management
A solution provider in Argentina has developed an AI-based license plate recognition solution to enable smart city applications. The solution was deployed to 100+ intersections in the capital Buenos Aires to enhance law enforcement. There is potential future expansion to nearby territories. The Advantech ARK-3532 with VEGA-330 AI module is a perfect solution which provides plentiful I/Os and many expansion options. It also has vision AI acceleration capability to process streaming data from multiple IP cameras to recognize license plates. Furthermore, the fanless and robust industrial design supports a wide range of operating temperatures to cope with harsh outdoor environments.

**Benefits**
- NVIDIA Jetson Xavier NX with Ubuntu image preload
- IP40 compact dimensions and easy to install
- 12-24V wide power and -10 ~ 55 °C working temperature

**AI-Enabled Service Robots**

The AI service robot is designed to deliver items such as food or packages in public areas. AI is enabling automated path findings, obstacle detections, and finding the most efficient ways to deliver items. In this project, the AIR-020 acts as an AI engine platform with NVIDIA Jetson Xavier NX. Its lightweight design and wide input voltage range makes it easy to install for this kind of application. It also provides a sufficient number of I/O ports including USB 3.2, COM, DIO, and CANBUS to connect camera sensors such as lidar sensors, cliff sensors, and ultrasonic sensors to avoid obstacles and deliver items to the assigned locations.

**Benefits**
- Intel Movidius VPU inside for AI acceleration
- Scalable for multi-stream video edge inference
- Powerful frame/platform for AI model deployment

**AI-Based License Plate Recognition in Smart City**

A solution provider in Argentina has developed an AI-based license plate recognition solution to enable smart city applications. The solution was deployed to 100+ intersections in the capital Buenos Aires to enhance law enforcement. There is potential future expansion to nearby territories. The Advantech ARK-3532 with VEGA-330 AI module is a perfect solution which provides plentiful I/Os and many expansion options. It also has vision AI acceleration capability to process streaming data from multiple IP cameras to recognize license plates. Furthermore, the fanless and robust industrial design supports a wide range of operating temperatures to cope with harsh outdoor environments.

**Benefits**
- Intel Movidius VPU inside for AI acceleration
- Scalable for multi-stream video edge inference
- Powerful frame/platform for AI model deployment
AI-Powered Earthquake Warning System

An AI-powered earthquake warning system has been designed for an Asia-Pacific country. The Advantech AIR-300 edge AI system is powered by an Intel® Core™ i7/Xeon® CPU, with a high-performance 350-Watt GPU card and up to 30TB of storage to serve as an edge center for receiving large amounts of data generated by various sensors. It analyzes patterns and sends alerts as early as possible to the data center when an earthquake is detected.

Benefits

- Server class computing power
- High performance visual computing
- Equipped with a 850W power supply

School Pandemic Prevention and Containment

A Taiwanese system integrator specializing in school IT and surveillance system integration has developed AI-based epidemic prevention systems. Advantech EI-52 worked reliably to detect body temperatures and mask-wearing. Following installation, the system was capable of sending the names of students with high body temperatures or without face masks to school staff using LINE push notifications. Advantech helped this SI overcome budgetary and technical challenges — creating a total AI-based facial recognition and thermal imaging solution for schools in Taiwan.

Benefits

- AI engine with 99.7% accuracy rate
- Built-in APIs quickly integrate with school management systems, student information databases, and LINE push notification systems
- High visual recognition performance
Edge AI Inference Systems

<table>
<thead>
<tr>
<th>Model Name</th>
<th>AIR-020X</th>
<th>AIR-020T</th>
<th>AIR-020N</th>
<th>AIR-030</th>
<th>AIR-101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platform</td>
<td>NVIDIA Jetson Xavier NX</td>
<td>NVIDIA Jetson TX2 NX</td>
<td>NVIDIA Jetson Nano</td>
<td>NVIDIA Jetson AGX Orin 32 GB / 64GB</td>
<td>Intel® Atom® E3940</td>
</tr>
<tr>
<td>AI Processor</td>
<td>Maxwell 384 CUDA</td>
<td>256 NVIDIA CUDA cores</td>
<td>Maxwell 128 CUDA</td>
<td>Up to 2048 NVIDIA CUDA</td>
<td>2 x Intel Myriad X Myriad X (VEGA-330)</td>
</tr>
<tr>
<td>AI Performance</td>
<td>Up to 21 TOPs</td>
<td>Up to 1.33 TFLOPs</td>
<td>512 GFLOPs</td>
<td>Up to 275 TOPs</td>
<td>Up to 8 TOPs</td>
</tr>
<tr>
<td>Display</td>
<td>1 x HDMI 2.0</td>
<td>1 x HDMI 2.0</td>
<td>1 x HDMI 2.0</td>
<td>1 x HDMI 2.0</td>
<td>2 x HDMI</td>
</tr>
<tr>
<td>LAN</td>
<td>2 x GbE</td>
<td>2 x GbE</td>
<td>1 x GbE</td>
<td>3 x GbE (Optional 2 x PoE)</td>
<td>2 x GbE</td>
</tr>
<tr>
<td>I/O Ports</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>GPIO</td>
<td>1 x 8-bit</td>
<td>1 x 8-bit</td>
<td>1 x 8-bit</td>
<td>1 x 16-bit</td>
<td>1 x 8-bit</td>
</tr>
<tr>
<td>COM</td>
<td>2</td>
<td>Up to 2</td>
<td>1</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>USB</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>CANBus</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Expansion</td>
<td>1 x M.2 2280 128GB built-in</td>
<td>1 x M.3 2280 128GB built-in</td>
<td>1 x M.2 2280 128GB built-in</td>
<td>1 x M.2 B-Key 2280/3052 1 x M.2 5-Key 2280 1 x PCIe x16</td>
<td>1 x M.2 2280 E-Key</td>
</tr>
<tr>
<td>Operating Temp.</td>
<td>-10° ~ 55 °C with 0.7 m/s airflow</td>
<td>-10° ~ 55 °C with 0.7 m/s airflow</td>
<td>-10° ~ 55 °C with 0.7 m/s airflow</td>
<td>-10° ~ 50 °C with 0.7 m/s airflow</td>
<td>-20 ~ 55 °C, with 0.7m/s airflow</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>138 x 110 x 43.6</td>
<td>138 x 110 x 43.6</td>
<td>138 x 110 x 43.6</td>
<td>200 x 220 x 74</td>
<td>53.5 x 158 x 114</td>
</tr>
<tr>
<td>Operating System</td>
<td>Ubuntu 18.04 with JetPack SDK 4.5.1</td>
<td>Ubuntu 18.04 with JetPack SDK 4.5.1</td>
<td>Ubuntu 18.04 with JetPack SDK 4.5.1</td>
<td>Ubuntu 20.04 with JetPack SDK 5.0.1</td>
<td>Win 10, Ubuntu 20.04</td>
</tr>
</tbody>
</table>

AI Acceleration Modules

<table>
<thead>
<tr>
<th>Model Name</th>
<th>VEGA-320</th>
<th>VEGA-330</th>
<th>VEGA-340</th>
</tr>
</thead>
<tbody>
<tr>
<td>SoC</td>
<td>One Myriad X MA2485</td>
<td>One/Two Myriad X MA2485</td>
<td>Four/Eight Myriad X MA2485</td>
</tr>
<tr>
<td>Form Factor</td>
<td>M.2 2230 (Key A+E)</td>
<td>Full size miniPCIe</td>
<td>Low profile PCIe x 4</td>
</tr>
<tr>
<td>Dimensions</td>
<td>22 x 30 x 3.7 mm</td>
<td>30 x 50.95 x 4.9 mm</td>
<td>171.1 x 68.9 mm</td>
</tr>
<tr>
<td>Signal Interface</td>
<td>PCIe x 1, USB 2.0</td>
<td>PCIe x 1, USB 2.0</td>
<td>PCIe4, Gen 2</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-20 ~ 60 °C</td>
<td>-20 ~ 55 °C</td>
<td>-20 ~ 60 °C</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>3.8W</td>
<td>3.8W / 7.6W</td>
<td>16.8W / 28W</td>
</tr>
<tr>
<td>Driver Support</td>
<td>Win10 Enterprise 64-bit, Ubuntu 16.04.1 / Kernel 4.4.8 64-bit</td>
<td></td>
<td>Win10 Enterprise 64-bit, Ubuntu 18.04</td>
</tr>
</tbody>
</table>
### Edge AI Servers

<table>
<thead>
<tr>
<th>Model Name</th>
<th>AIR-300</th>
<th>AIR-500D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform</strong></td>
<td>6th/7th Gen Intel® Xeon®/Core™ i3/i5/i7 LGA1151</td>
<td>Intel Xeon D-1700 series, 4/6/10 core, up to 67W</td>
</tr>
<tr>
<td><strong>GPU Card Support</strong></td>
<td>1 x PCIe x16 GPU card, up to 350W</td>
<td>2 x PCIe x16 GPU card, up to 700W</td>
</tr>
<tr>
<td><strong>AI Performance</strong></td>
<td>Depends on GPU (compatible with NVIDIA RTX-A4500)</td>
<td>Depends on GPU (compatible with NVIDIA RTX-A4500, Tesla T4 and Tesla A2)</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>1 x HDMI + 1 x VGA</td>
<td>1 x VGA via BMC</td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>4 x GbE</td>
<td>4 x GbE</td>
</tr>
<tr>
<td><strong>I/O Ports</strong></td>
<td><strong>GPIO</strong></td>
<td><strong>GPIO</strong></td>
</tr>
<tr>
<td></td>
<td>1 x 16 bit</td>
<td>1 x 16 bit</td>
</tr>
<tr>
<td></td>
<td><strong>COM</strong></td>
<td><strong>COM</strong></td>
</tr>
<tr>
<td></td>
<td>4 x RS-232/422/485</td>
<td>4 x RS-232/422/485</td>
</tr>
<tr>
<td></td>
<td><strong>USB</strong></td>
<td><strong>USB</strong></td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>2 x 2.5&quot; SATA III SSD</td>
<td>4 x 2.5&quot; SATA III SSD</td>
</tr>
<tr>
<td><strong>Expansion</strong></td>
<td>2 x full-size mPCIe</td>
<td>1x M.2 2230/2242/2280/3030/3042/3052 B key</td>
</tr>
<tr>
<td></td>
<td>1 x M.2 2230 E-Key</td>
<td>1 x M.2 2230 E key</td>
</tr>
<tr>
<td></td>
<td>1 x PCIe x 16</td>
<td>1 x PCIe x 16</td>
</tr>
<tr>
<td><strong>Power Input</strong></td>
<td>850W PSU built-in</td>
<td>1200W PSU built-in</td>
</tr>
<tr>
<td></td>
<td>100 ~ 240 VAC</td>
<td>100 ~ 240 VAC</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>0 ~ 50 °C with 0.7m/s air flow</td>
<td>-10 ~ 50 °C with 0.7m/s air flow</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>228.3 x 230 x 399.92 mm</td>
<td>280 x 270 x 399 mm</td>
</tr>
<tr>
<td><strong>Operating System</strong></td>
<td>Win 10, Ubuntu 20.04</td>
<td>Win 10, Ubuntu 20.04</td>
</tr>
</tbody>
</table>

### AI Facial Recognition

**FaceView Facial Recognition**
- Fast face attribute detection
- 95-98% accuracy rate
- Age/gender/emotion detection

**FaceView Masked Face Recognition**
- Proper mask wearing detection (over the nose and mouth)
- Half-covered face identification

**FaceView Epidemic Prevention**
- Independent 3-in-1 application
- Standard & face mask core features
- Body temperature detection

### Face Mask Solution Package

<table>
<thead>
<tr>
<th>Model Name</th>
<th>EI-A52-S2FVM</th>
<th>EI-A52-S6FVT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform</strong></td>
<td>Intel 11th Gen Core i3 CPU</td>
<td>Intel 11th Gen Core i5 CPU</td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td>Identify and Mark Visitor Faces, Masked Individual Recognition, Mask Detection</td>
<td>Identify and Mark Visitor Faces, Masked Individual Recognition, Mask Detection, Temperature Detection</td>
</tr>
<tr>
<td><strong>Advanced Facial Attributes</strong></td>
<td>Age, Gender, Emotion, ID, Head Position</td>
<td>-</td>
</tr>
<tr>
<td><strong>Body Temperature</strong></td>
<td>-</td>
<td>Real-time Detection</td>
</tr>
<tr>
<td><strong>Power Input</strong></td>
<td>19V</td>
<td>19V</td>
</tr>
<tr>
<td><strong>Operating Temp.</strong></td>
<td>-10 ~ 50 °C</td>
<td>-10 ~ 50 °C</td>
</tr>
</tbody>
</table>
Why Advantech Edge AI Solutions?

### Accelerated Deployment
- Performance optimization
- Container & OTA deployment
- Ubuntu, Yocto OS porting & customization

### Large-scale Management
- Large-scale mgmt. & remote monitoring
- Secure TLS/SSL connection

### Reliable & Diversified Product Portfolio
- AI acceleration cards, systems and servers
- Industrial and compact designs

### World Wide Offices

#### Asia Pacific
- **Taiwan**
  - Toll Free: 0800-777-111
  - Taipei & IoT Campus: 866-2-7732-3399
  - Taichung: 866-4-2372-5058
  - Kaohsiung: 886-7-392-3600
- **China**
  - Toll Free: 0800-810-0345
  - Beijing: 86-10-6298-4346
  - Shanghai: 86-21-3332-1616
  - Shenzhen: 886-755-8212-4222
  - Chengdu: 86-28-2545-0198
  - Hong Kong: 852-2720-5118
- **Japan**
  - Toll Free: 0800-500-1055
  - Tokyo: 81-3-602-1021
  - Osaka: 81-6-6267-1887
  - Nagoya: 81-0-8000-500-1055
  - Nagoya: 81-49-22-2890
- **Korea**
  - Toll Free: 080-363-9494/5
  - Seoul: 82-2-3660-9255
- **Singapore**
  - Singapore: 65-8442-1000
- **Malaysia**
  - Kuala Lumpur: 60-3-7726-4188
  - Penang: 60-4-537-9188
- **Thailand**
  - Bangkok: 66-02-2488306-9
- **Vietnam**
  - Hanoi: 84-24-3399-1155
  - Hochiminh: 84-28-3836-8586
- **Indonesia**
  - Jakarta: 62-21-751-1939
- **Australia**
  - Toll Free: 1300-308-531
  - Melbourne: 61-5-5979-0100
- **India**
  - Bangalore: 91-94-4839-7300
  - Pune: 91-94-2260-2349

#### Europe
- **Netherlands**
  - Eindhoven: 31-40-267-7000
  - Breda: 31-76-523-3100
- **Germany**
  - Toll Free: 00800-2426-8080/81
  - Munich: 49-89-12599-0
  - Düsseldorf: 49-2103-97-855-0
- **France**
  - Paris: 33-1-4119-4666
- **Italy**
  - Milan: 39-02-9544-961
- **UK**
  - Newcastle: 44-0-191-262-4844
  - London: 44-0-870-493-1433
- **Spain**
  - Madrid: 34-91-668-86-76
- **Sweden**
  - Stockholm: 46-0-864-60-500
- **Poland**
  - Warsaw: 48-22-31-51-100
- **Russia**
  - Moscow: 8-800-555-01-50
  - St. Petersburg: 8-812-332-57-27
  - 8-921-575-13-59
- **Czech Republic**
  - Ústí nad Orlicí: 420-465-524-421
- **Ireland**
  - Galway: 353-91-792444

#### Americas
- **North America**
  - Toll Free: 1-866-576-9668
  - Cincinnati: 1-513-742-8895
  - Milpitas: 1-408-519-3898
  - Irvine: 1-949-420-2500
  - Ottawa: 1-815-433-5100
  - Chicago: 1-888-576-9668
- **Brazil**
  - São Paulo: 0800-770-5355
  - 55-11-5592-5367
- **Mexico**
  - Toll Free: 1-800-810-0345
  - Mexico City: 52-55-6275-2777
  - Guadalajara: 52-33-3169-7670
- **Poland**
  - Warsaw: 8-800-555-01-50
  - St. Petersburg: 8-812-332-57-27
  - 8-921-575-13-59
- **Czech Republic**
  - Ústí nad Orlicí: 420-465-524-421
- **Ireland**
  - Galway: 353-91-792444

#### Middle East and Africa
- **Middle East and Africa**
  - Toll Free: 1-800-810-0345
  - South Africa: 55-11-5592-5367
- **Brazil**
  - São Paulo: 0800-770-5355
  - 55-11-5592-5367
- **Mexico**
  - Toll Free: 1-800-467-2415
  - Mexico City: 52-55-6275-2777
  - Guadalajara: 52-33-3169-7670
- **Poland**
  - Warsaw: 8-800-555-01-50
  - St. Petersburg: 8-812-332-57-27
  - 8-921-575-13-59
- **Czech Republic**
  - Ústí nad Orlicí: 420-465-524-421
- **Ireland**
  - Galway: 353-91-792444

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