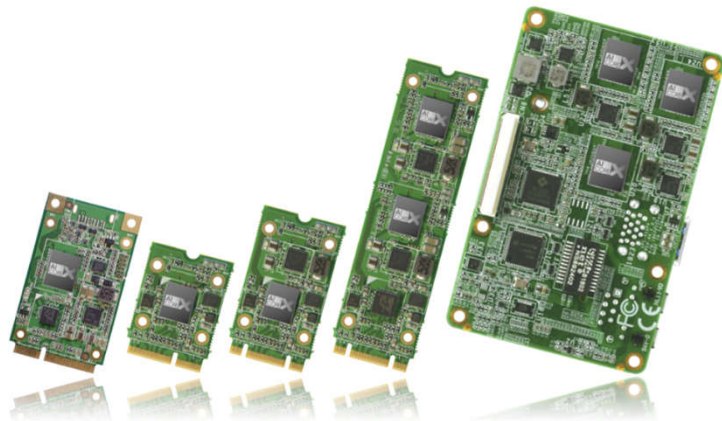




AAEON Edge AI Solution



Date: 4/4/2019



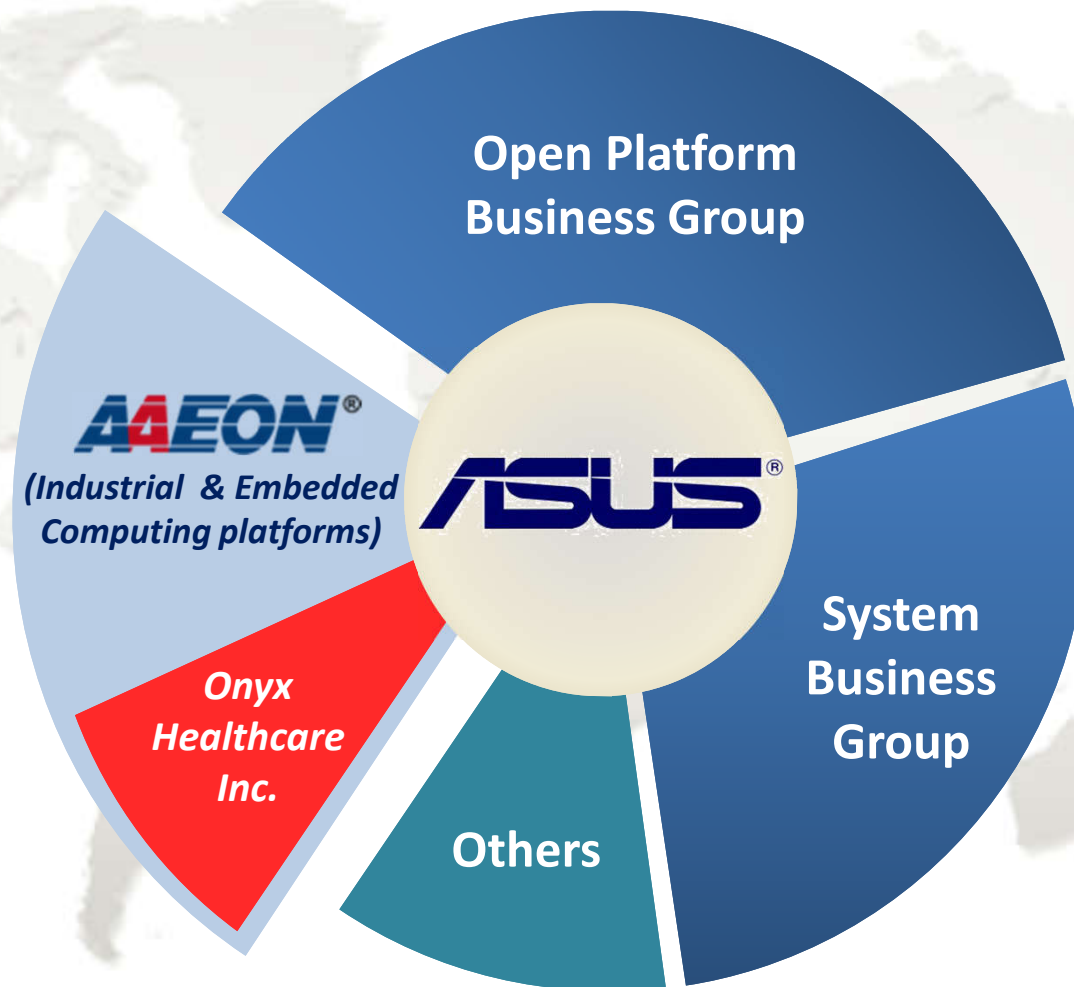
Contents



- About AAEON
- AI Edge Solutions
- UP Family
- Applications

ASUS + AAEON

AAEON[®]
an ASUS assoc. co.



Synergy with ASUS



Solutions Offering

IOT PLATFORMS AND SOLUTIONS



INDUSTRIAL SYSTEMS

SPD



Embedded Box PC,
HMI/Panel PC

NSD



Firewall & NVR

RMD



Rugged Tablet PC

DMS/IOT



INDUSTRIAL AND EMBEDDED CPU BOARDS

ECD



Embedded CPU Board
3.5", 5", PC-104 SBCs, COM

IPC-BU



Industrial Mother Board
(ATX, Mini-ITX, etc.)



Edge AI
MCU Nodes &
ATOM/ARM
Gateway

SOLUTION

PRODUCT

AAEON Solution Offering



ECD

Embedded
Computing
Division



PICO, 3.5", 5",
PC-104 SBCs
COM Express
PICMG SBCs
Passive BP
Onboard AI
ASIC



IPC

Industrial PC
Business
Unit



Industrial
Motherboards
*Slim Low profile
Systems*



SPD

System
Platform
Division



Embedded
Fanless Box PC
HMI/Panel PC
Industrial
Display
Rack Mount IPC
AI @ Edge
Gateway



NSD

Network
Security
Division



Firewall
NVR
Network
Appliance
Cloud Server



RMD

Rugged
Mobile
Division



Semi-rugged &
Rugged Tablet
PC
Handheld PC
PICO ARM



DMS

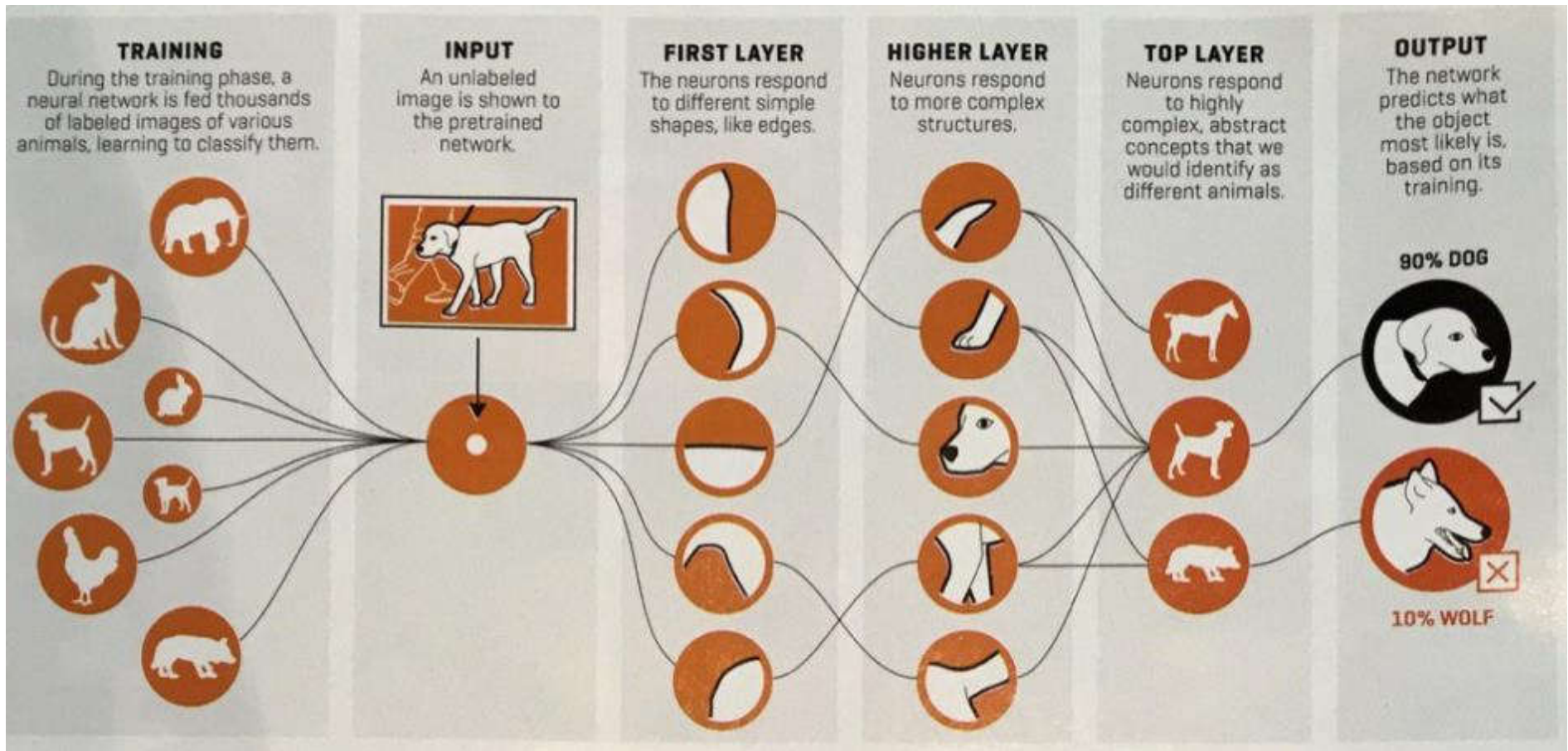
Design
Manufacturing
Services



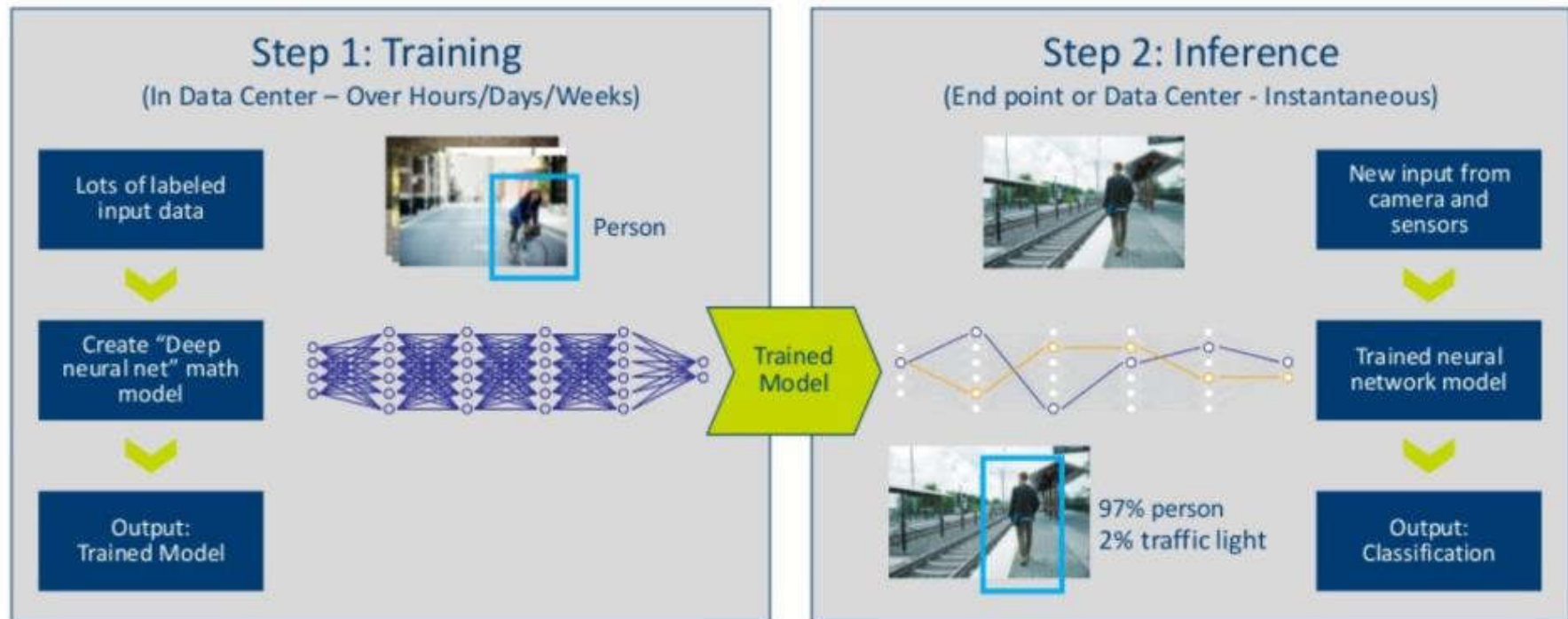
ODM
IoT Solution
UP Series
AI Core X



How AI Works



AI Edge Inference



- ✓ Large dataset
- ✓ Deep neural network
- ✓ Cloud-based to scale

- ✓ Bandwidth & Latency
- ✓ Privacy
- ✓ Connectivity
- ✓ Power efficiency

AAEON: The Right Hardware



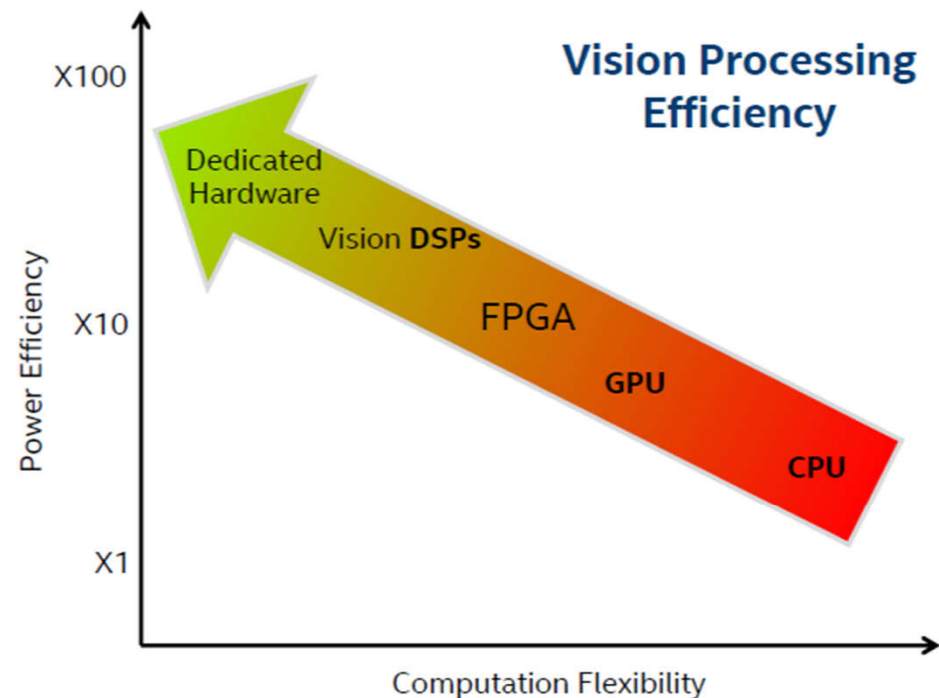
Choosing the “Right” Hardware

Power/Performance Efficiency Varies

- Running the right workload on the right piece of hardware → higher efficiency
- Hardware acceleration is a must
- Heterogeneous computing?

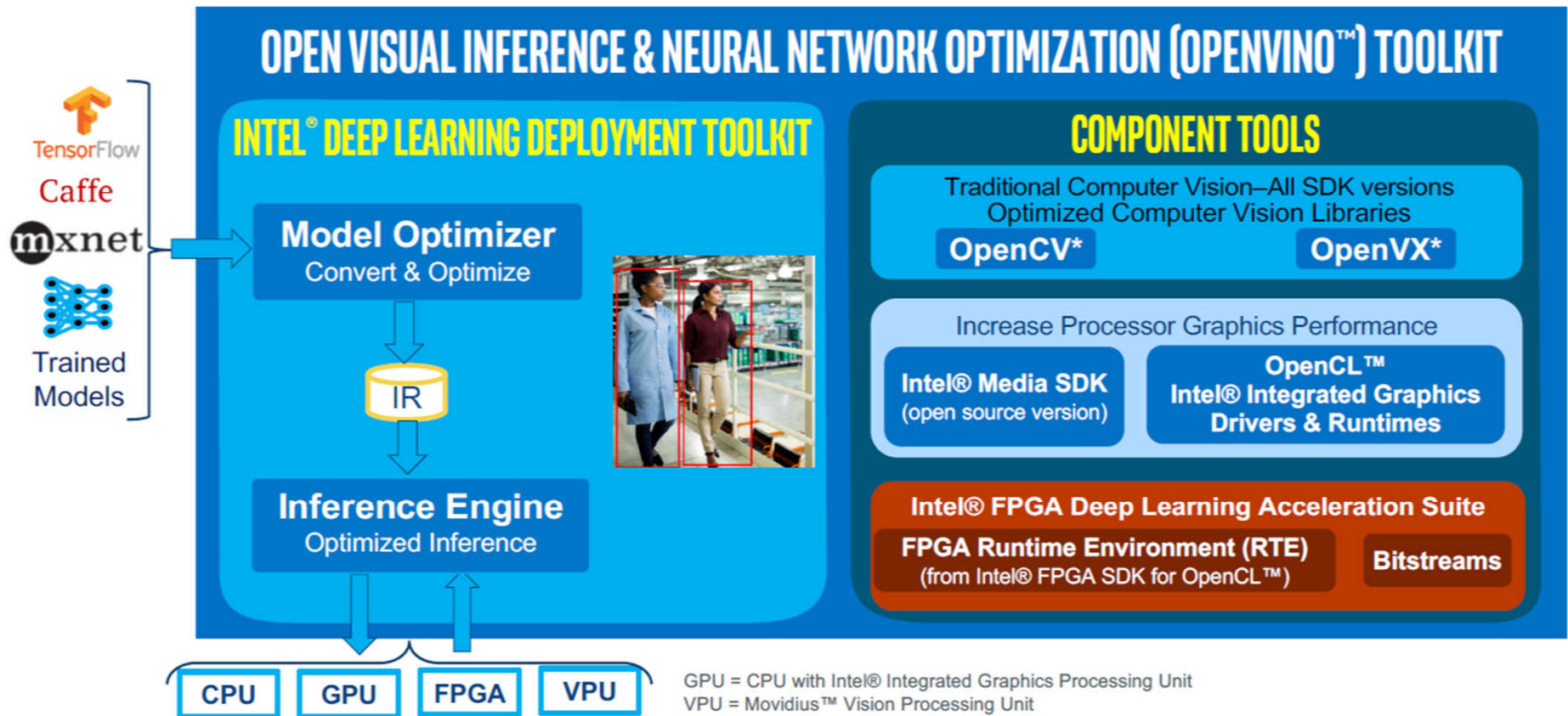
Tradeoffs

- Power/performance
- Price
- Software flexibility, portability

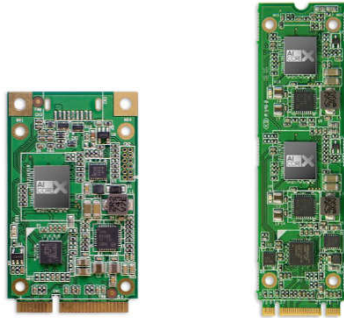


Intel OpenVINO Toolkit

OpenVINO™ Toolkit



AAEON AI Edge



Intel[®]
MOVIDIUS™
Myriad X

Video Processing Unit
(Hardware Neural Network)

Optimized for ML &
Real Time Pattern Recognition



Intel[®] Cyclone[®]
10 GX

Programmable Versatile
Architecture

Super Rich I/O

Real Time High Speed Signal
Analysis

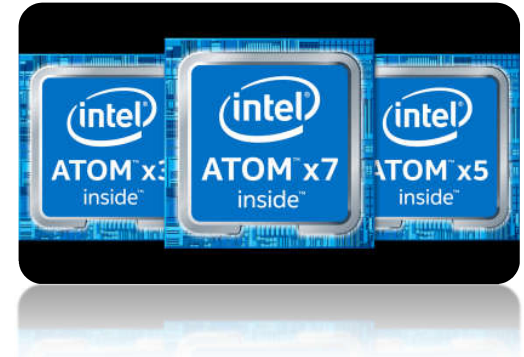


Intel[®]
Atom x5/x7
Celeron/Pentium

Low Power Consumption
Quad Core 64 bit x86
Architecture

GPU integrated

Rich I/O



AI Core-X/XM/Vision Plus



AI Core-X

- mini PCI-e
- 1x Myriad X



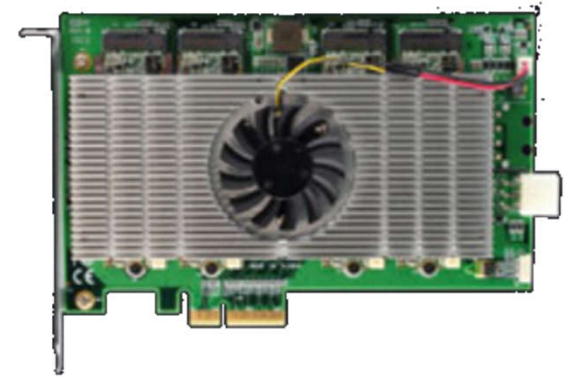
AI Core-XM 2280

- M.2 2280
- 2x Myriad X



AI Vision Plus

- Board to board connector
- Compatible for UP Core Plus
- 3x Myriad X



AI Core XP4/XP8

- PCIe x4
- 4x or 8x Myriad X

AI Core X/XM

Model	AI Core X	AI Core XM 2280	AI Vision Plus X	AI Core XP4/XP8
Form factor	Full-Size mPCIe	M.2 2280 B+M key	Custom	Half-Length PCIe Card
Numbers of SoC	1	2	3	4 or 8
Dimension	51 x 30 mm	22 x 80 mm	90 x 56.5 mm	111 x 170 mm
GPIO reset (F75114)	Yes			
Thermal	Heatsink	Heatsink with active fan		
PCIe to USB3 bridge	Yes			
Connector Interface	PCIe	PCIe	Custom	PCIex 4
OpenVINO Compliance	Yes			
MP Schedule	Now	Jun'19		

AI Core X/XM Compatibility Matrix

Model	Interface Support	AI Core X	AI Core XM 2280	PCIe x4 Card
UP Squared	mini-PCIe FS	Yes	No	No
	m.2 2230 E-Key	No	No	No
UP Core Plus AI Edge/Net Plus	mini-PCIe FS	Yes	No	No
PICO-APL1	mini-PCIe FS	Yes	No	No
PIGENE-KBU6 GENE-APL5	mini-PCIe FS	Yes	No	No
	Mini-PCIe HS	No	No	No
EPIC-KBS9	Mini-PCIe FS	Yes	No	No
	PCIe [x4]	No	No	Yes
MIX-KLUW1	m.2 2280	No	Yes	No
MIX-H310A1	m.2 2280	No	Yes	No
	PCIe [x16]	No	No	Yes

AI Vision X Development Kit

Deep learning inference for computer vision with CPU, GPU, and VPU

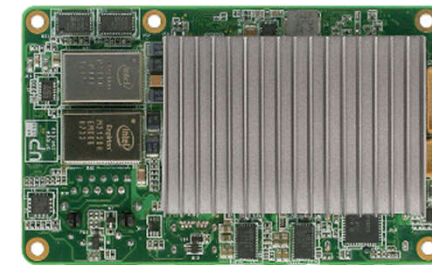
- UP Squared with E3950 in aluminum enclosure
- AI Core X (optional)
- USB Camera
- Pre-installed Software
 - Ubuntu 16.04 desktop
 - Intel® Distribution of OpenVINO™ toolkit
 - Intel® System Studio 2019 Ultimate Edition
 - Intel® Media SDK
 - Drivers for Intel® VTune™ Amplifier, Intel® Energy Profiler, Intel® Graphics Performance Analyzers
 - MRAA and UPM I/O and sensor libraries for C++, Python, Java, and JavaScript



* Contents may be different depending on regions

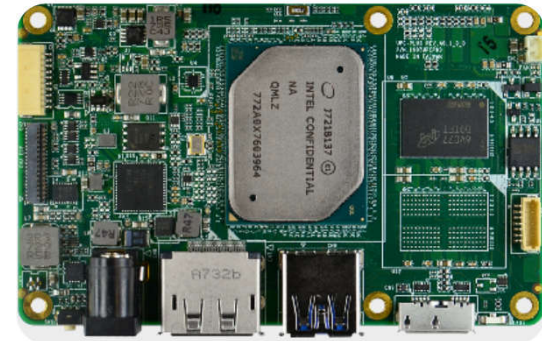
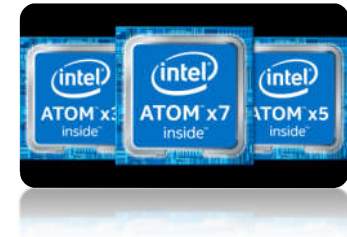
AI Plus

- Intel Cyclone 10gx 105 / 150 / 220 K1e
- Display Port IN connected to Cyclone
- LVDS IN connected to Cyclone
- USB 3.1 Device Type C connected to Cyclone
- GPIO connected to Cyclone
- USB 3.0 Type A connected to mainboard UP Core Plus
- mPCI-Express connected to UP Core Plus
- Gbit Ethernet connected to UP Core Plus

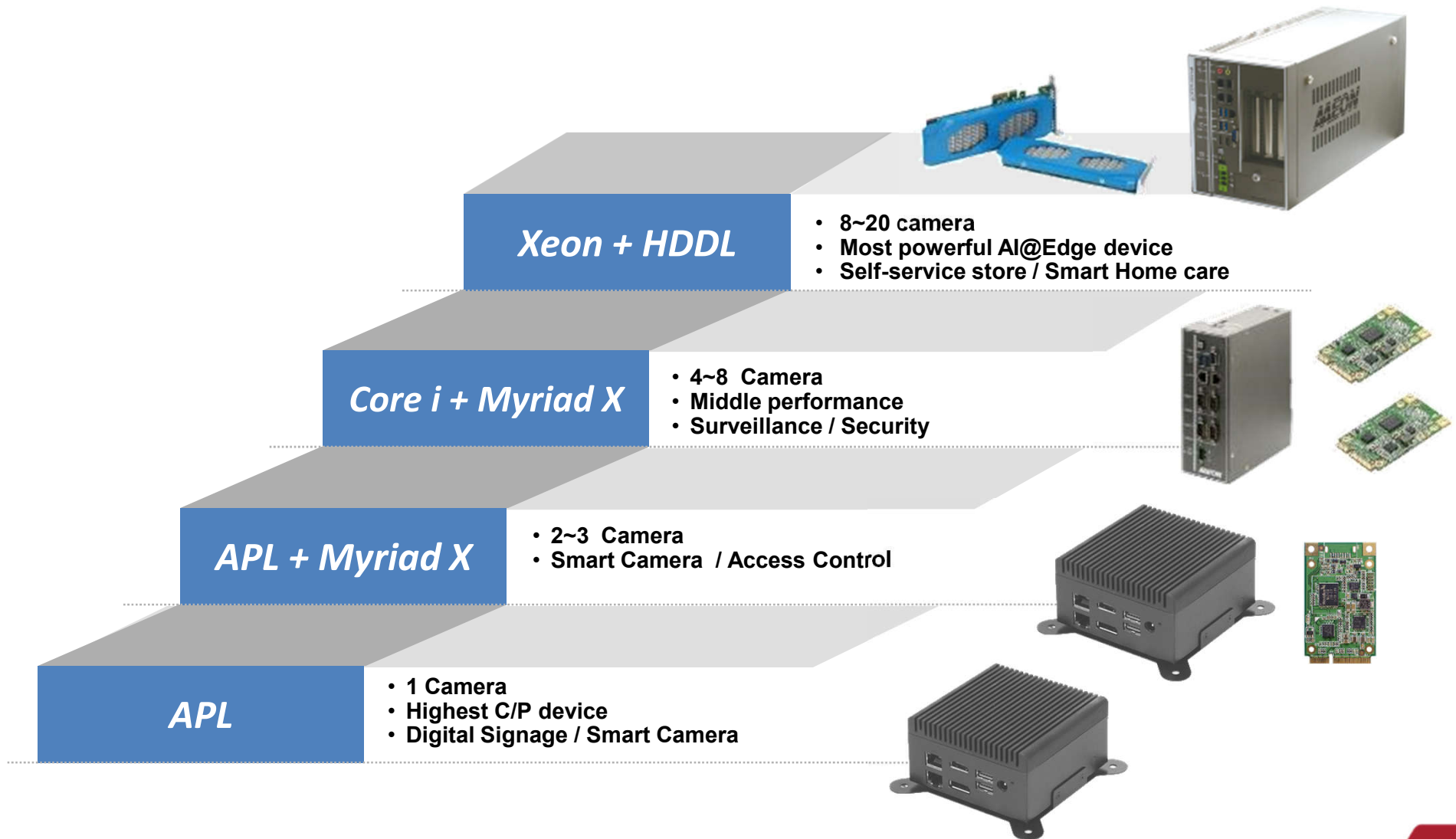


UP Core Plus

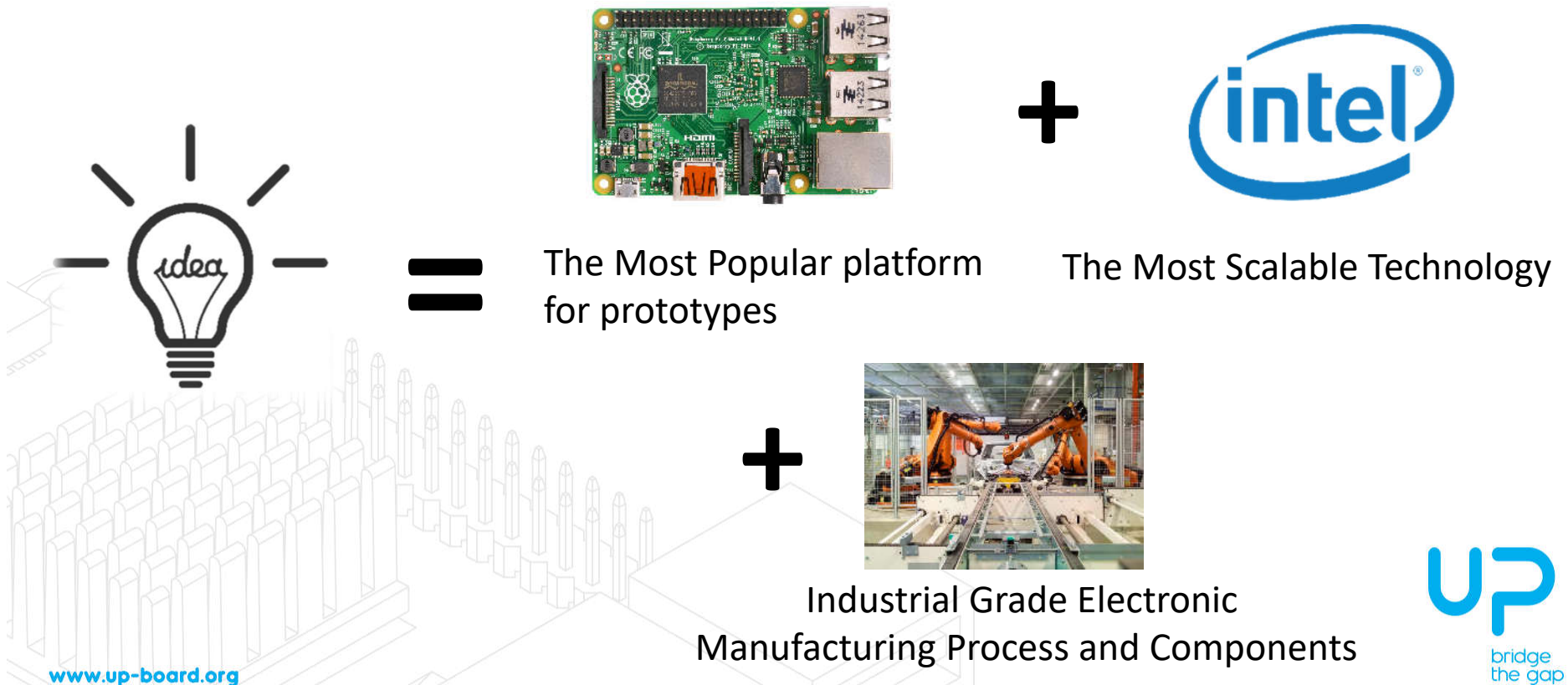
- Intel® Atom™ x5 / x7 / Celeron® / Pentium®
- Credit Card Form Factor
- Stackable & Expandable
- Low Power Consumption
- 2/4/8 GB DDR4 Dual Channel 2400 MHz
- 32/64/128 GB eMMC
- DP 4K@60 Hz, eDP
- USB 3.0 Type A/OTG Micro B
- WiFi 802.11 AC 2T2R
- 2 x 100 pin expansion connector
- Compatible with UP Core expansion board
- 12V DC In







AAEON AI Edge Solutions



How UP Started



UP Series

	UP	UP Squared	UP Core	UP Core Plus
				
Dimensions	85.6 x 56.5 mm	85.6 x 90 mm	56.5 x 66 mm	56.5 x 90 mm
Processor	Cherry Trail Z8350	Apollo Lake (N/E Series)	Cherry Trail Z8350	Apollo Lake (N/E Series)
HAT	40-pin HAT	40-pin HAT 60-pin EXHAT	100-pin EXHAT	2x 100-pin EXHAT
Display	HDMI eDP	HDMI, DP	HDMI eDP	DP eDP
USB	4x USB 2.0	3x USB 3.0 1x USB OTG 3.0	1x USB 3.0	1x USB 3.0 1x USB OTG 3.0
LAN	1x RJ-45	2x RJ-45	WiFi n/BT	WiFi ac/BT
DC In	5V			12V

UP Family

UP Board Series

UP Boards



UP



UP Squared



UP core

UP HATs



UP Kits



UP System



UP AI Edge

Main Boards



UP Core Plus

AI Accelerator



AI Core

FPGA



AI Plus

Expansion



Net Plus

UP Expansion Boards



Mobile power HAT

- 40-pin
- Power by battery pack



Anybus Common Ethernet Slave

- mPCIe
- Automation protocol



Power over Ethernet

- 40-pin
- Power over LAN



eDP adapter

- Convert LVDS to eDP



Audio HAT


- 40-PIN
- Line-out, MIC, buzzer





Fanless metal chassis & DIN RAIL kit





UP Squared Grove IoT Development Kit


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 Sign in

 English


 **IOT**
Hardware


 Share


UP SQUARED* GROVE* IOT DEVELOPMENT KIT


Reduce development time for your intensive computing applications with a kit that includes integrated software and end-to-end tools.


[Get Started](#) [Buy](#)



 Documentation

 Tutorials

 Sensor Library

 Forum

UP Squared Grove IoT Development Kit



List of Content:

UP Squared Intel Celeron N3350, 2GB DDR4, 32GB eMMC
Power Supply
Grove Adapter
Grove Sensors (LCD RGB Backlight, - Rotary Angle Sensor, Light Sensor v1.2, Button, Temperature & Humidity Sensor)
16GB USB drive
USB3.0 OTG cable

Pre-loaded **ubuntu** supported by Arduino Create


Product page:

<https://software.intel.com/en-us/iot/hardware/up-squared-grove-dev-kit>



IoT Gateway Systems

Industrial Grade IoT Gateway Family
UP single boards that are industrially built for pros



UP Board

UP Square

UP Core

UP-GWS01

UPS-GWS01

UPC-GWS01

intel IoT Solutions Alliance

Target Applications



Smart Retail



Smart Factory



Security /
Surveillance



Smart Parking

Facial Recognition

Security Monitoring

License Plate Identification

Defect Inspection

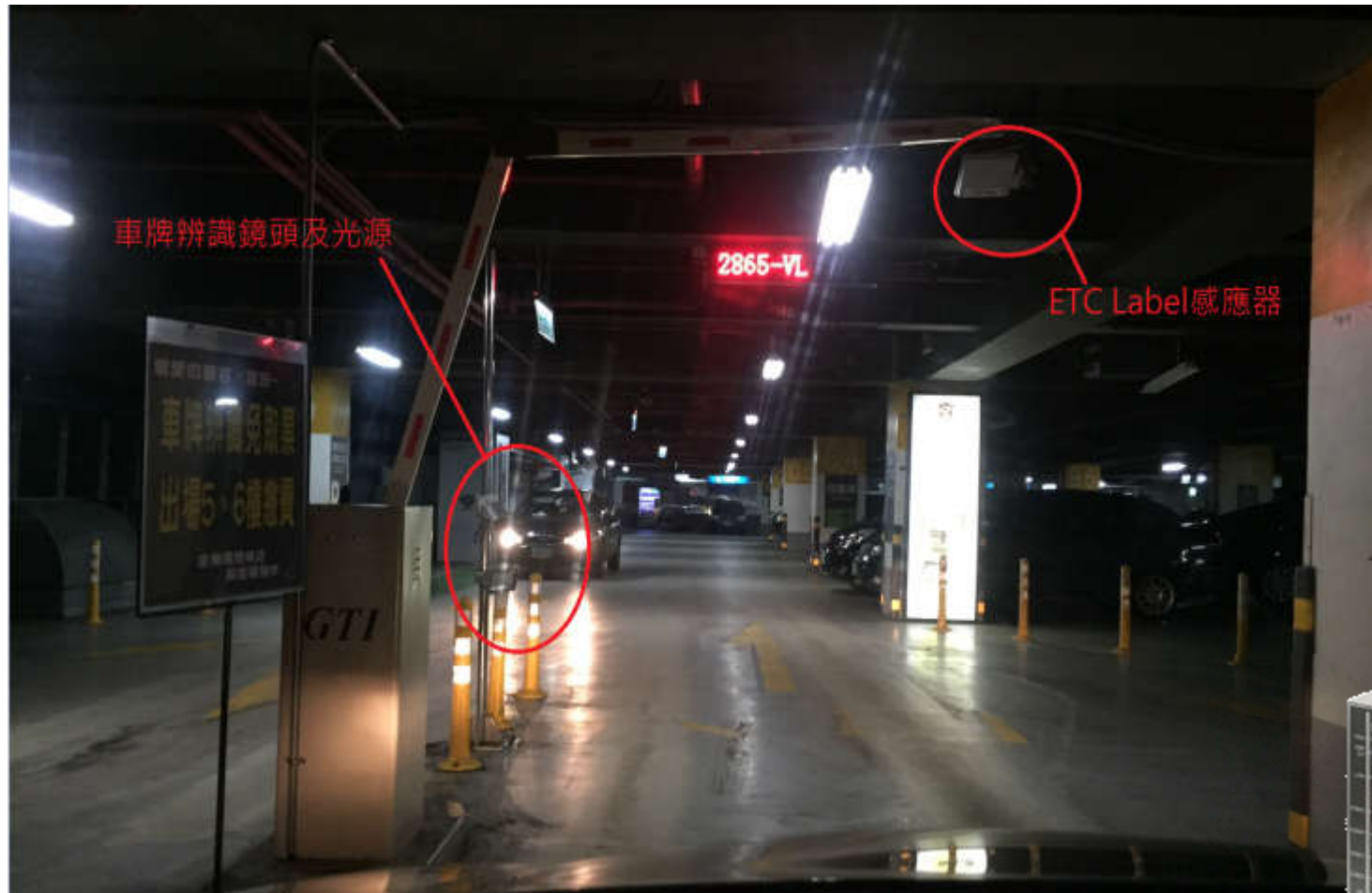
Security Patrol

Security Robot - Japan



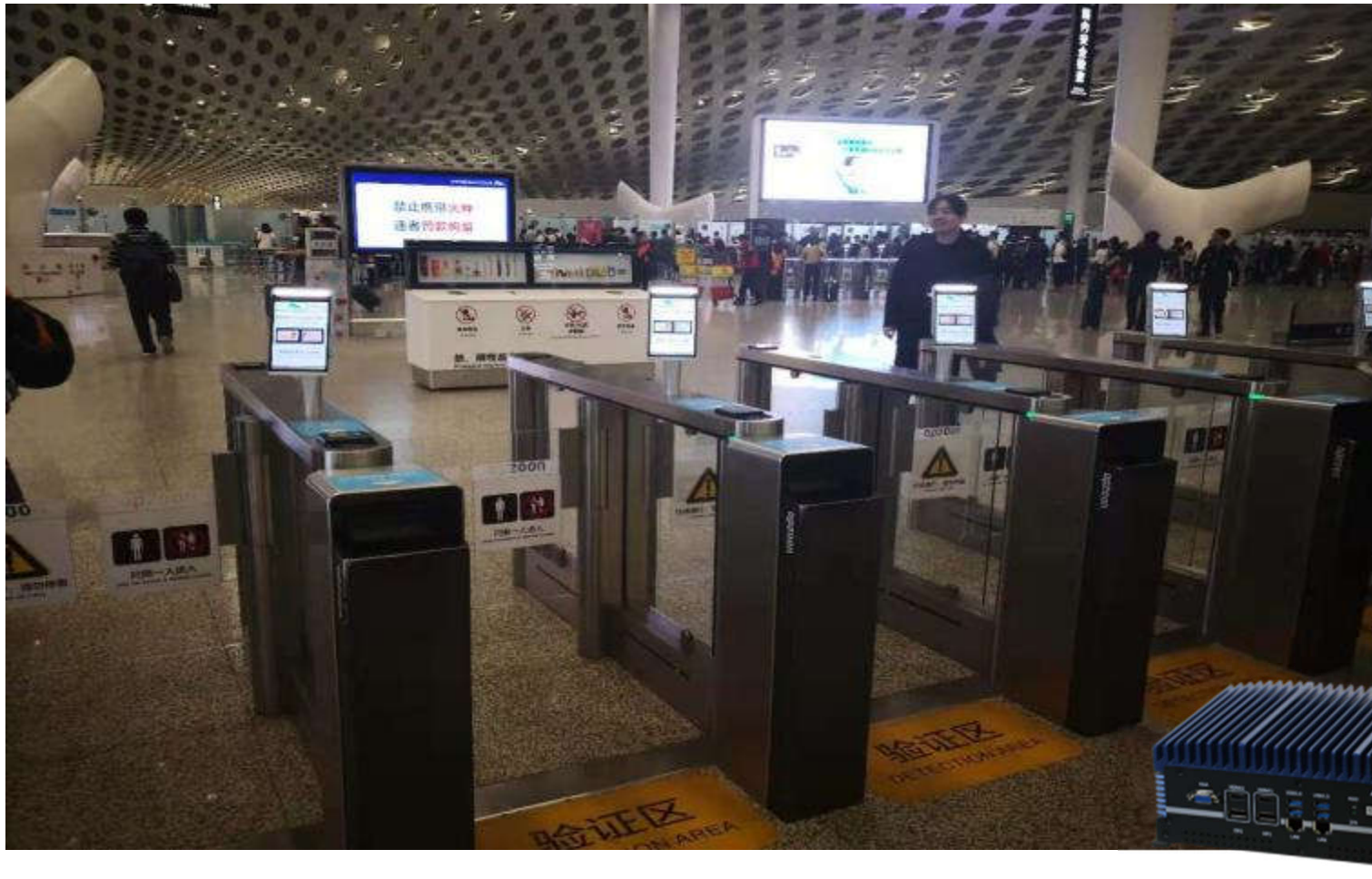
License Plate Recognition

License plate recognition in parking lot-Taiwan



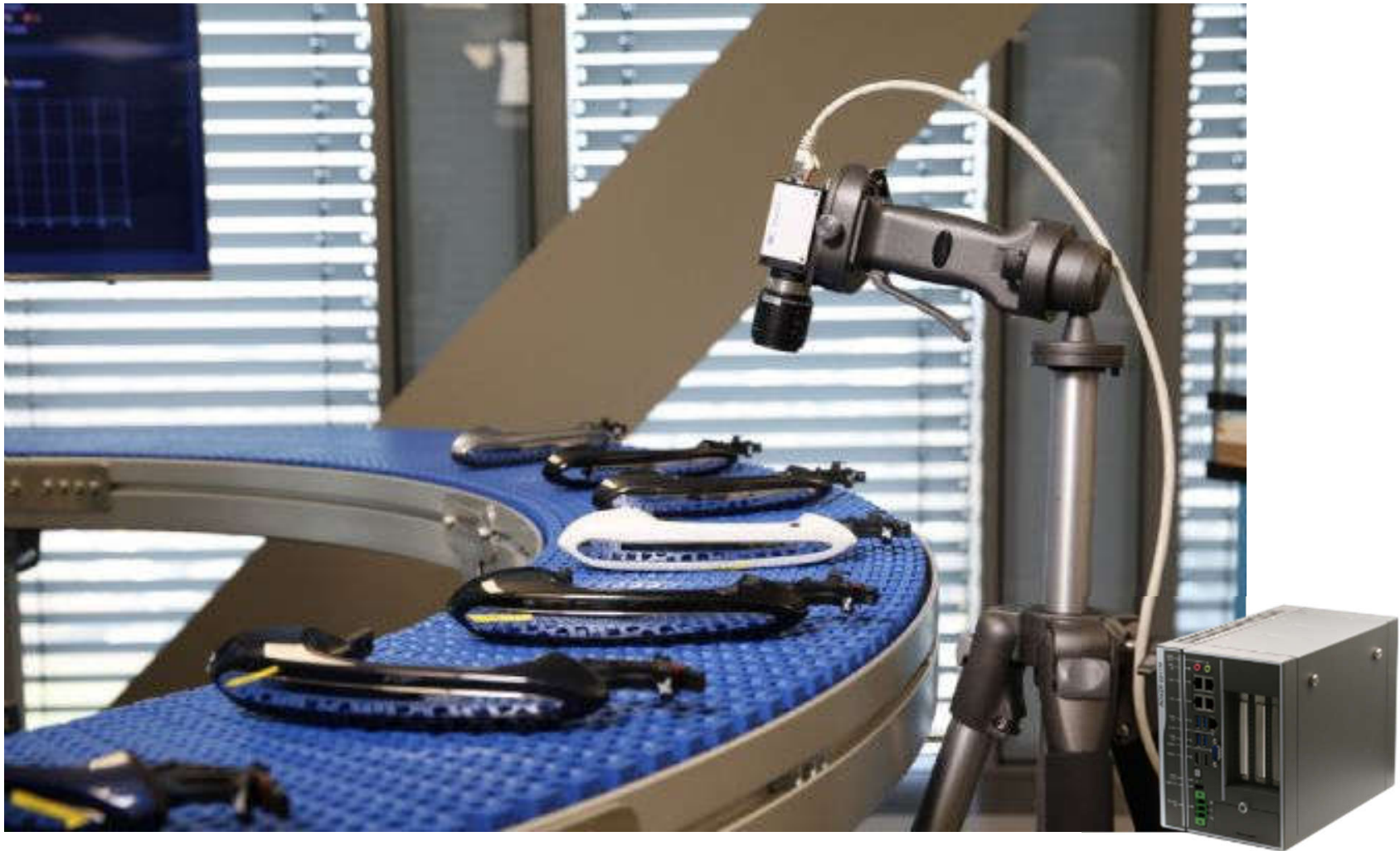
Facial Recognition

Facial recognition in subway turnstile-China



Objection Detection

Assembly Inspection - Taiwan





Application Videos

Work Safety:

https://www.youtube.com/watch?v=-Wb_8VDGZD8&feature=youtu.be

Brand Recognition:

https://www.youtube.com/watch?v=so_3ki-Sc2U

Thank You