WEBINAR

TORSDAG DEN 6. MAJ KL. 14.00

Mød AI og Edge eksperterne på webinaret

Bring AI to the Edge with AAEON Solutions

Iris Huang
Product Sales Manager hos AAEON

Owen Wei
AI & IOT Product Solution Manager hos AAEON

sensor ECS

Presenter: Iris Huang (irishuang@aaeon.eu),
Owen Wei (owenwei@aaeon.eu)

AAEON® an ASUS assoc. co.

1956 DARTMOUTH

Artificial Intelligence (AI) Coined at Dartmouth

1956

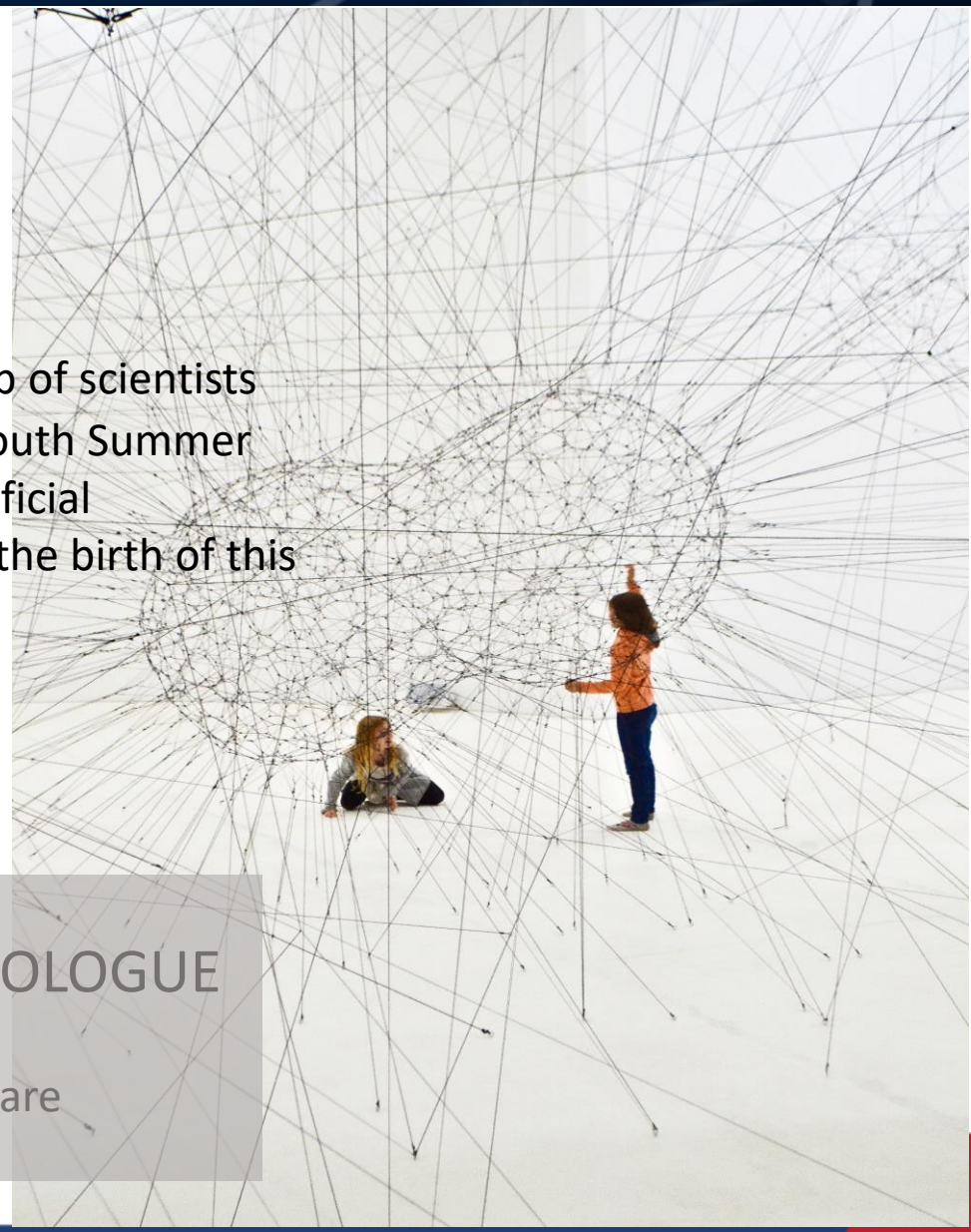
A PROPOSAL FOR THE

DARTMOUTH SUMMER RESEARCH PROJECT

ON ARTIFICIAL INTELLIGENCE

J. McCarthy, Dartmouth College
M. L. Minsky, Harvard University
N. Rochester, I. B. M. Corporation
C. E. Shannon, Bell Telephone Laboratories

In 1956, a small group of scientists gathered for the Dartmouth Summer Research Project on Artificial Intelligence, which was the birth of this field of research.



WHAT IS PAST IS PROLOGUE

William Shakespeare

AI ARCHITECTURE

Big Data

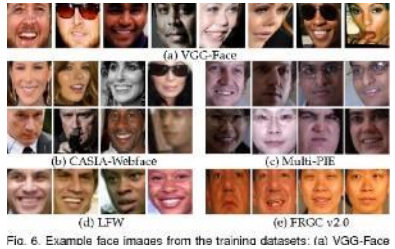


Fig. 6. Example face images from the training datasets: (a) VGG-Face

Algorithm

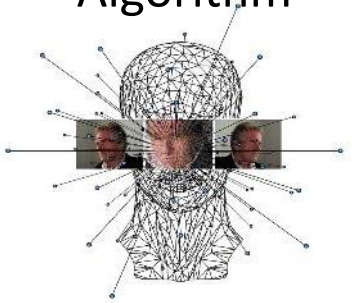


Image Classification | Object Detection | Image Segmentation

Face Detection/Recognition | Video Classification | Speech Recognition

Framework

Caffe2 | TensorFlow Hub | Caffe | PyTorch

Computing Power

Training

Inference at the Edge Server

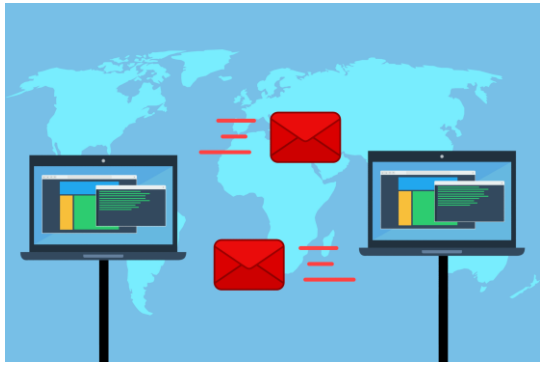
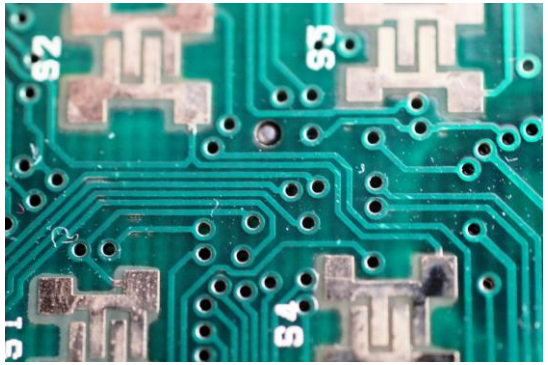
Inference at the Edge Devices

Jetson

OS

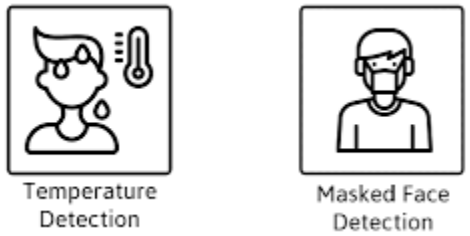
Why AI at the edge matters?

With the explosive growth of connected devices world wide, combined with a demand for Bandwidth Privacy/Confidentiality, Low Latency, Availability constraints, AI models trained in the cloud increasingly need to be run at the edge.

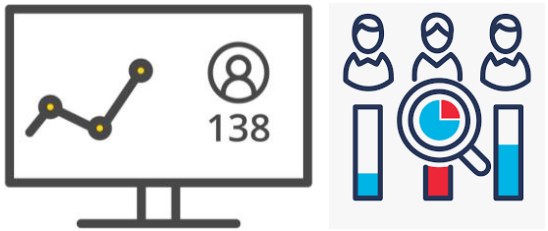
BANDWIDTH	LATENCY	PRIVACY	AVAILABILITY
			
1 billion cameras WW (2020) 10's of petabytes per day	30 images per second 200ms latency	Confidentiality Private cloud or on-premise storage	50% of populated world < 8mbps Bulk of uninhabited world no 3G+

Edge Computing: Close to where the data/events generate

A Day in Life with AAEON's Edge AI Solution – Retail

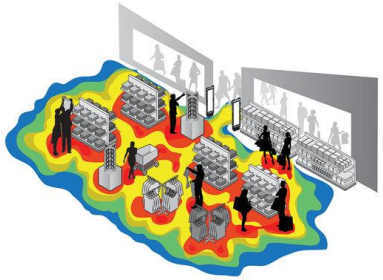


Mask/Temperature
Access Control System



People Counting
Occupancy Statistic
Crowd Analytic

VIP/shoplifter recognition



Heatmapping

Social Distancing

Smart Digital Signage

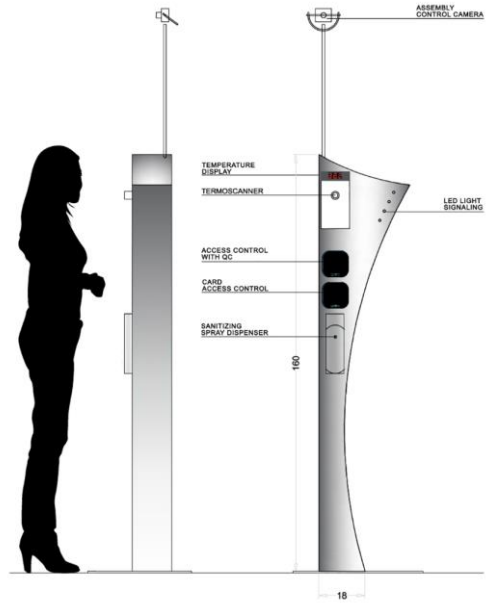
Shelf Management
Brand Interaction

Remove Object Detection

Queue Detection

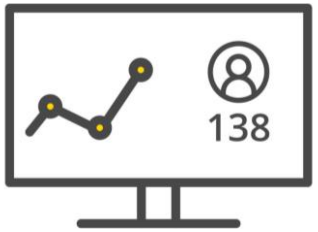
Automated check-out

Edge AI in Retail Store To Fight Covid-19



Temperature Detection

Masked Face Detection



People Counting/Occupancy

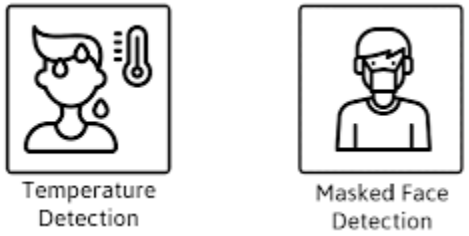
Social Distancing

UP Squared

- Intel® Movidius™ Myriad™ X
- CPU: Intel Atom® x7-E3950
- GPU: Intel® HD Graphics 505
- 8GB RAM, eMMC 64GB
- USB 3.0 Type A x3
- HDMI x 1, DP x 1, LAN x 2
- DC-in 5V power input
- Operation Temp: 0~60˚C

A Day in Life with AAEON's Edge AI Solution – Industrial

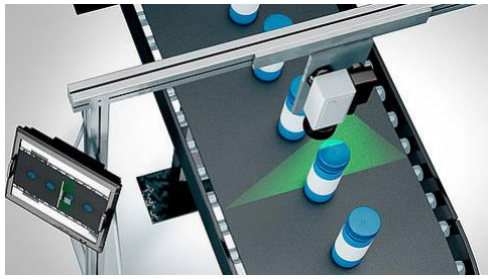
Intrusion/loitering detection



Mask/Temperature Access Control System

Personal Protective Equipment Detection

Smoke/Flame Detection



Automatic Quality Control

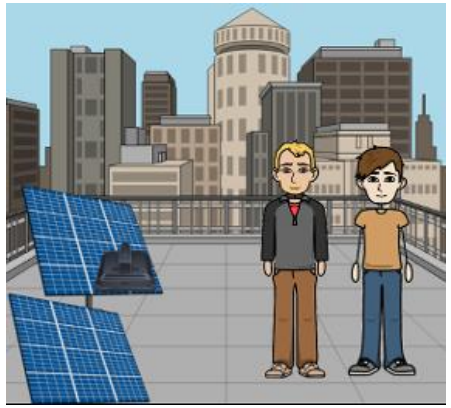
Edge AI in Quality Control

Project: Inspection of FFP2 face masks

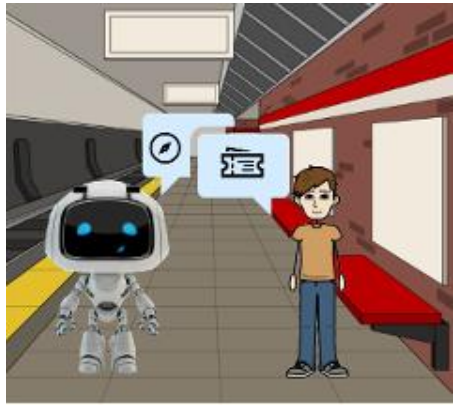
Project: Inspection of roof tiles

A Day in Life with AAEON's Edge AI Solution – Robotics

Sorting Robot



Maintenance Robot



Assistive Robot

Warehouse AMR

Replenishment Robot

AAEON an ASUS assoc.co.

Focus • Agility • Competitiveness

Robotic Real Use Case

Retail Assistant

Hotel/Bank Service Robot

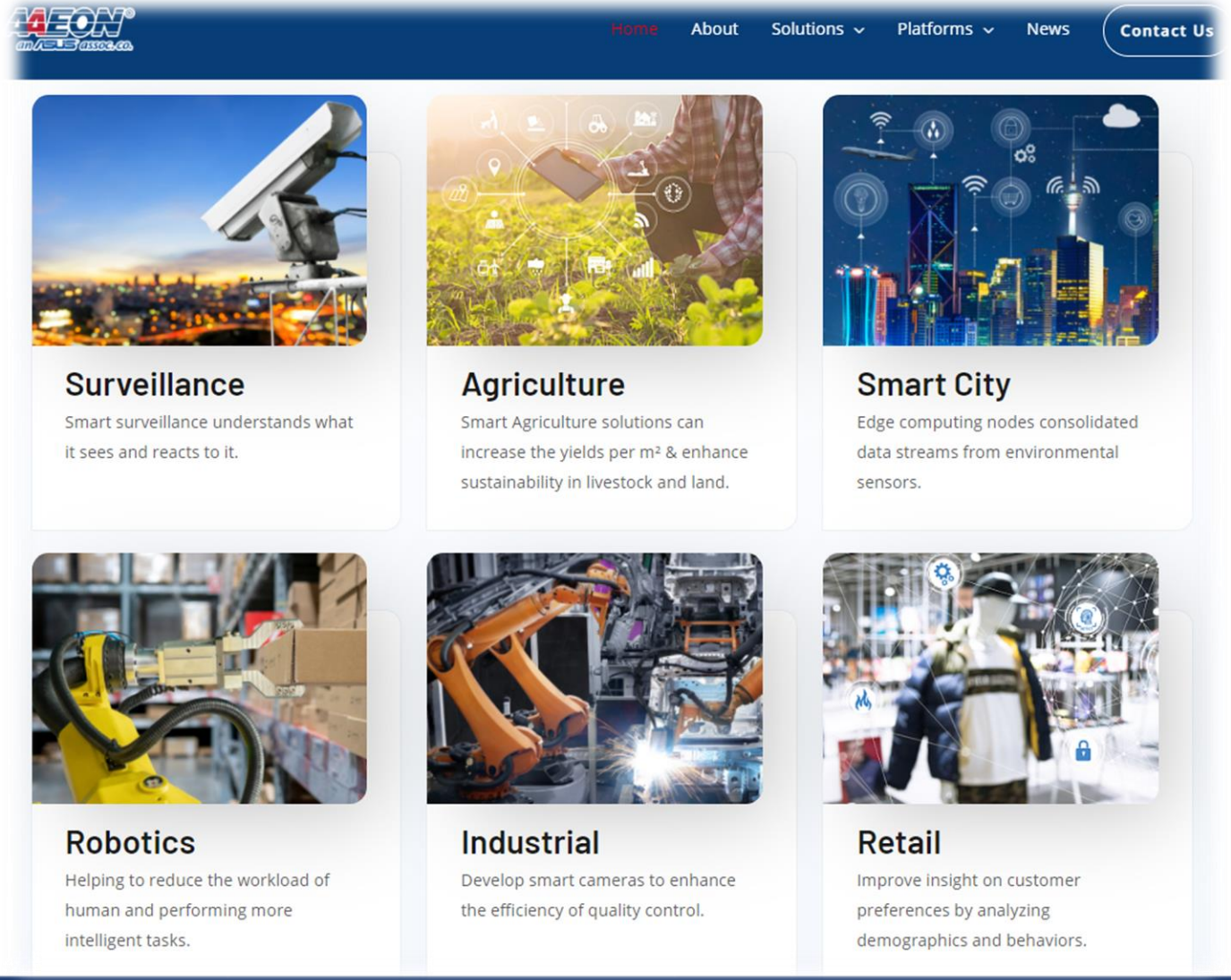
Security Robot

Service Robot

Home Robot

AAEON's Focus Vertical Markets

Focus • Agility • Competitiveness
www.aaeon.com



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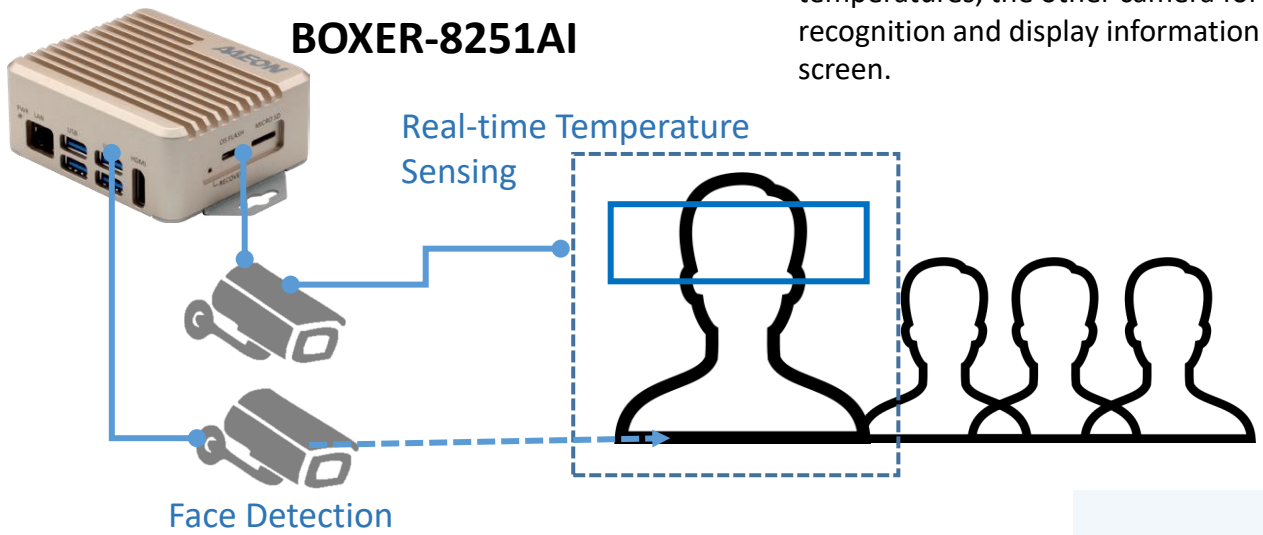
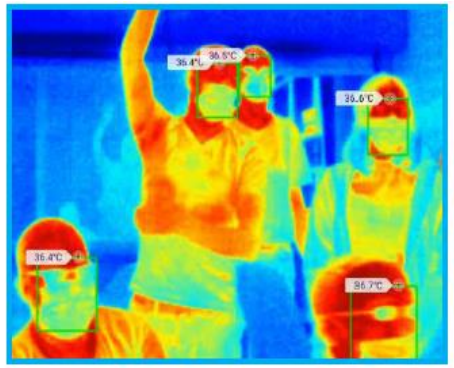
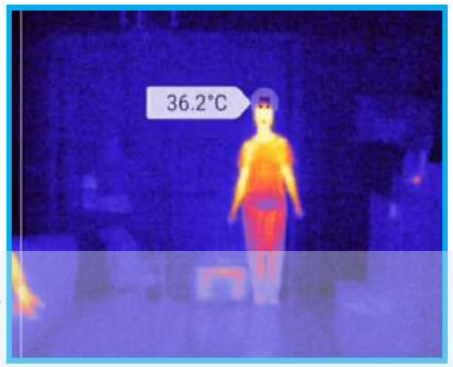
COVID CAUGHT ON CAMERA

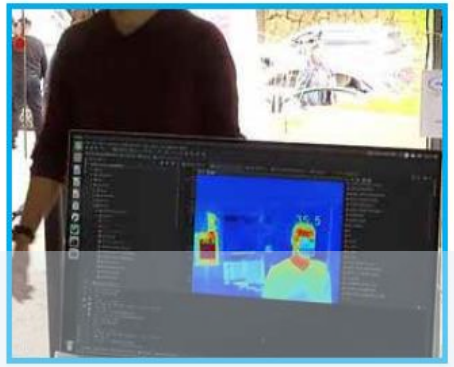
Infrared imaging systems



Use an infrared camera to check body temperatures, the other camera for face recognition and display information on screen.







Features

Efficient
Up to 20 simultaneous scans with advanced facial detection algorithm

Quick Hotspot Detection
Less than 0.3 seconds

Unlimited Hotspot Detecion & Tracking

Scans multiple faces at once, with no distraction by other heat sources and no crowd interference.

Accurate
Accuracy levels of >95%

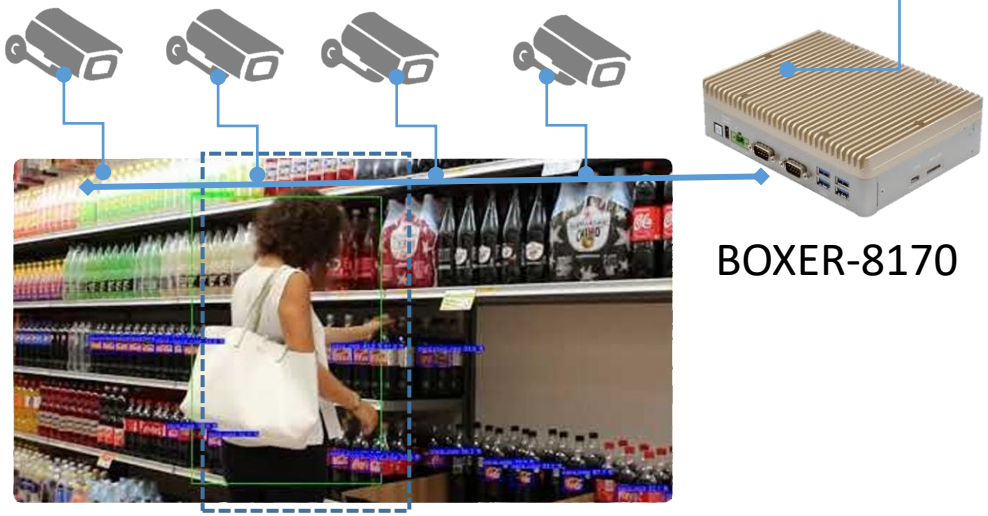
Rapid Deployment
Easy installation, light weight

Mask Detection
Social Distance
Sneeze Detection
People Counting
Body Temperature Monitoring
Thermal Detection

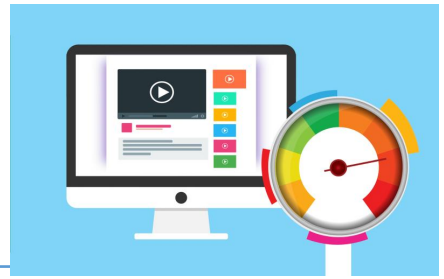
SMART RETAIL

Video Analysis

The needs for retailers to look for ways to optimize the in-store experience and the sales strategy are getting urgent. Through AI analytic power, smart retail can do customer analysis, brand analysis and inventory monitoring in order to provide better efficiency and insights for boasting sales and optimizing customer experience.

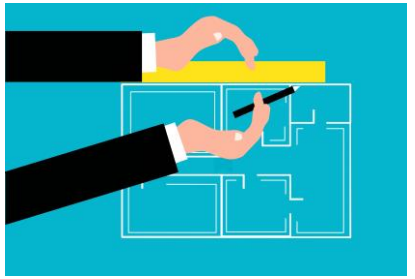


BOXER-8170



Age : 32
Gender : Female
Mood : Happy
VIP customer: Y

The system will be highly responsive and work in real-time to provide the updates to you in the web dashboard.



Footfall Analysis
Path Tracking
Heat Map Analysis

Customer Behaviour Analysis

Dwell Time Analysis
Dwell Zone
Heat Map Analysis
Queue Management
Social Distancing

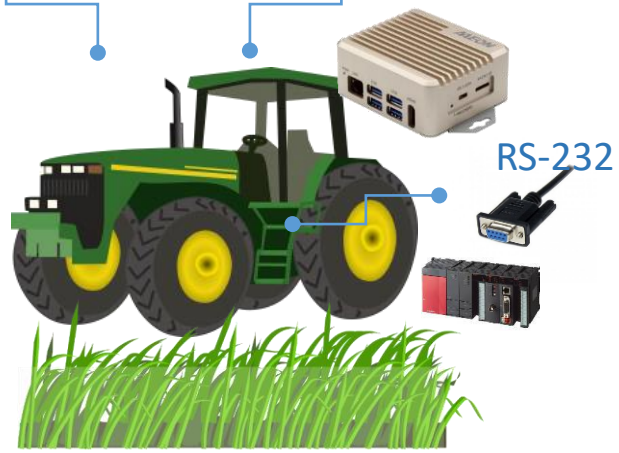
Facial Recognition

SMART AGRICULTURE

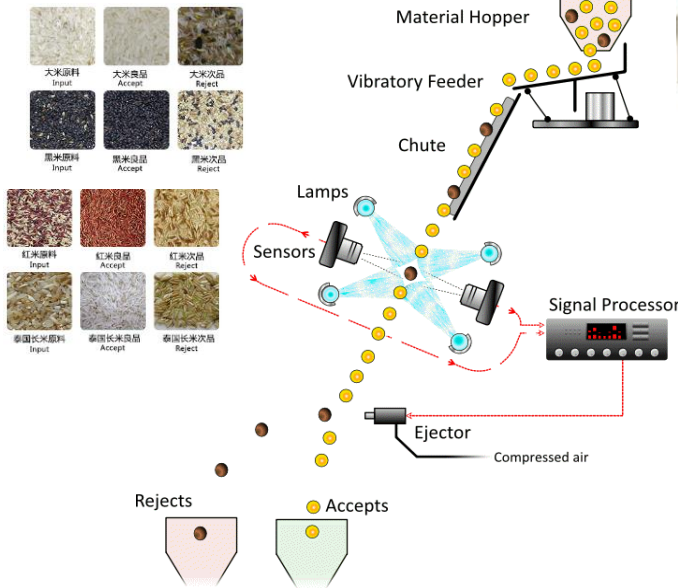
Feasible AI & AMRs related Applications

LIDAR

BOXER-8221



Self-Driving Vehicle



BOXER-8250AI

Xiaotangshan, Beijing

Weed Recognition

Disease Detection

Our BOXER-8240AI linked to the cameras to identify the images of the field in real time, and only spray herbicides on the weeds.

The software constantly gather of new field data from farms around the world, enables the software update new types of weed data to system to continuously improve the precision of the system.

https://v.qq.com/x/page/c30300q5qei.html

FLEET MANAGEMENT

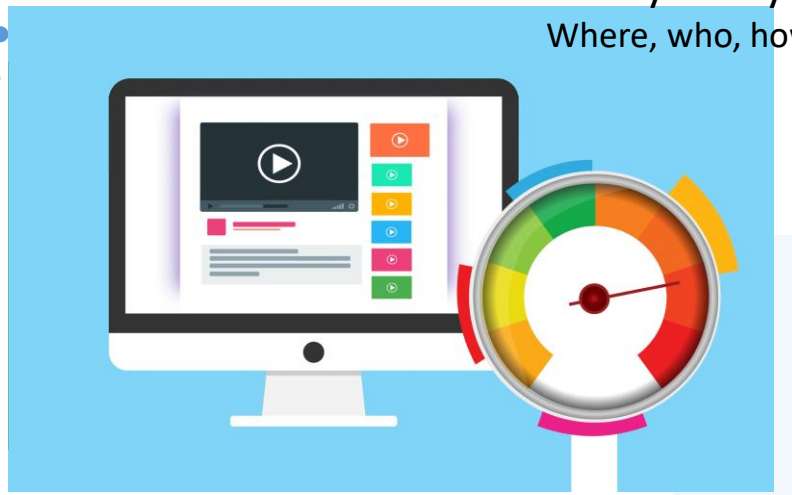
Thanks to advanced artificial intelligence, forklift with advanced algorithms can monitor and prevent warehouse accidents, protect operators, nearby employees, products and building infrastructure.

BOXER-8221AI

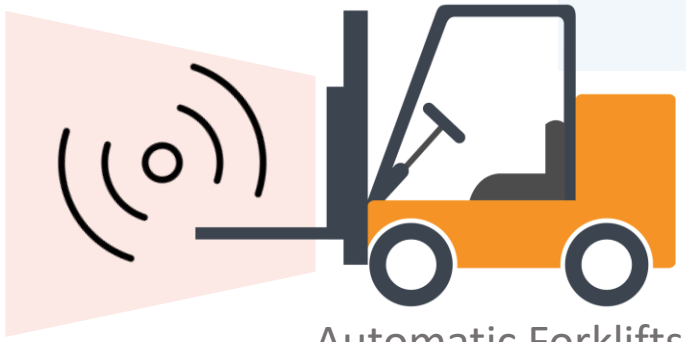
Upload data to backstage via connectivity

50%
AI Vision System
Reduce Accidents
up to 50%

Safety Analytics
Where, who, how



- Pedestrians Detection
- Objects Detection
- Path Planning
- Collision Prevention
- Risky Behavior Detection



Automatic Forklifts

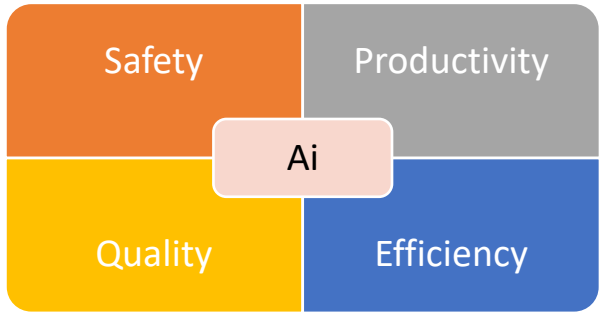
SMART MANUFACTURING

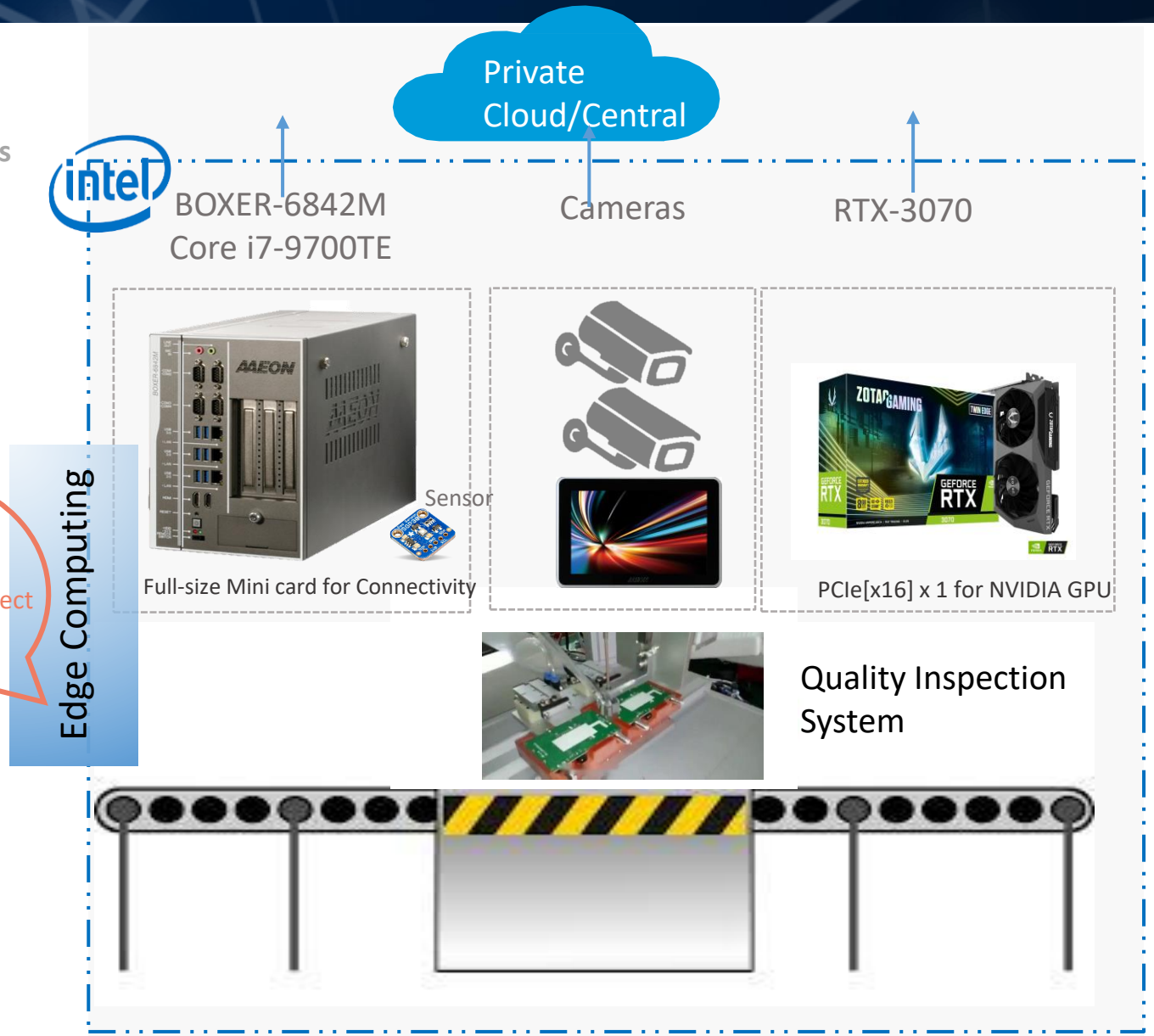
Automated Optical Inspection(AOI) is a common method highly reply on operator experience and complicated rules setting, not able to do self learning, incapable of classify defect types, more over, higher labor cost and often misjudge…

With Artificial Intelligence..

- Auto classify defect types
- Self learning new defect types(Deep Learning)
- High Accuracy and Precision
- Lower Labor Cost
- Shorten Defect judgement time

95%
Accuracy of defect classification 95%↑





https://www.aaeon.com/en/p/vision-system-box-pc-solutions-boxer-6842m

Why AAEON @ Edge Solutions

AAEON AI

AAEON works closely with our clients and partners to help develop hardware solutions for their Artificial Intelligence applications. With our OEM/ODM support, AAEON is the hardware partner you're looking for to bring AI projects to life.

Temperature Test
Wide-Range Temp

-20~50°C

Fanless
Fanless

Wide-Range power
9~24V

Aluminum Die-Cast/ Intrusion Mold

AAEON AI@ Edge Solutions

Wireless

- Wireless technologies support

Customization

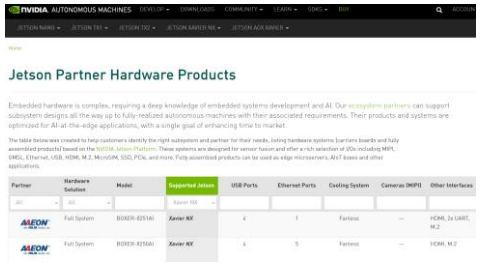
- Customized Syste/board Design

IP Protection Class

- IP40/IP66/IP67/ IP69K
- Water / Dust – Proof
- Industrial-Garde Rugged Design

NVIDIA

NVIDIA Partner Network (NPN)



Cost Effective

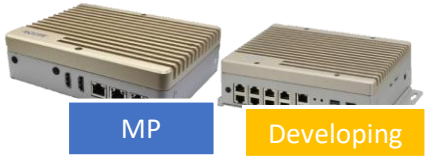
Multi-Control I/O

ACLINUX ubuntu Delivered by Canonical

OS Support

- Compatible with Ubuntu OS
- The most update NVIDIA JetPack SDK
- ACLinux/NVIDIA Ubuntu is free license fee.

AAEON NVIDIA JETSON FAMILY

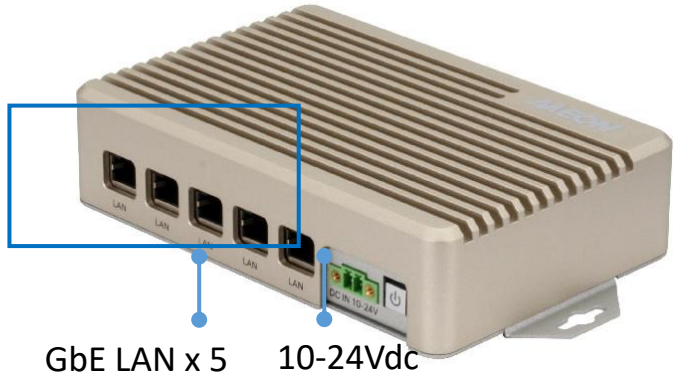
NVIDIA	Compact	USB	MIPI CSI2	POE / PD	POE / PSE	Multi-LAN
JETSON NANO	BOXER-8221AI MP			BOXER-8222AI MP	BOXER-8223AI Developing MP in May	BOXER-8220AI MP
JETSON TX2	BOXER-8110AI MP	BOXER-8150AI MP	BOXER-8130AI MP		BOXER-8170AI MP	BOXER-8120AI MP
JETSON Jetson TX2 NX	BOXER-8231AI Developing MP in Aug				BOXER-8233AI Developing MP in July	BOXER-8230AI Developing MP in June
JETSON Xavier NX	BOXER-8251AI MP				8253AI/8254AI  MP Developing	BOXER-8250AI MP
JETSON AGX Xavier					BOXER-8240AI MP in Aug MP	

BOXER-8230AI &BOXER-8233AI

New!

BOXER-8230AI
MP in June

JETSON
Jetson TX2 NX



GbE LAN x 5 10-24Vdc

RS-232 x 2

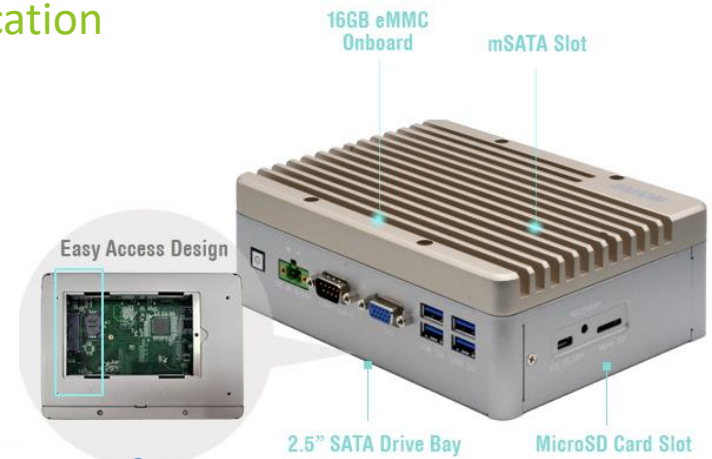
USB 3.2 Gen 1 x 4 HDMI

BOXER-8233AI
MP in July

AI + Control + Communication

JETSON
Jetson TX2 NX

HDMI In
HDMI Out
GbE LAN
PoE/PSE x 2



2.5" SATA Port

MiniCard (Full-Size)

M.2 E Key

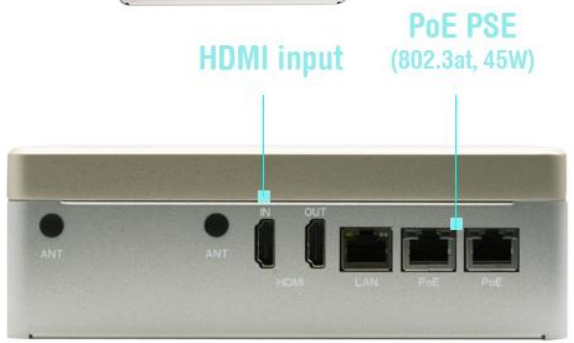
Controller (PLC / motor)

COM & CANbus

DiO

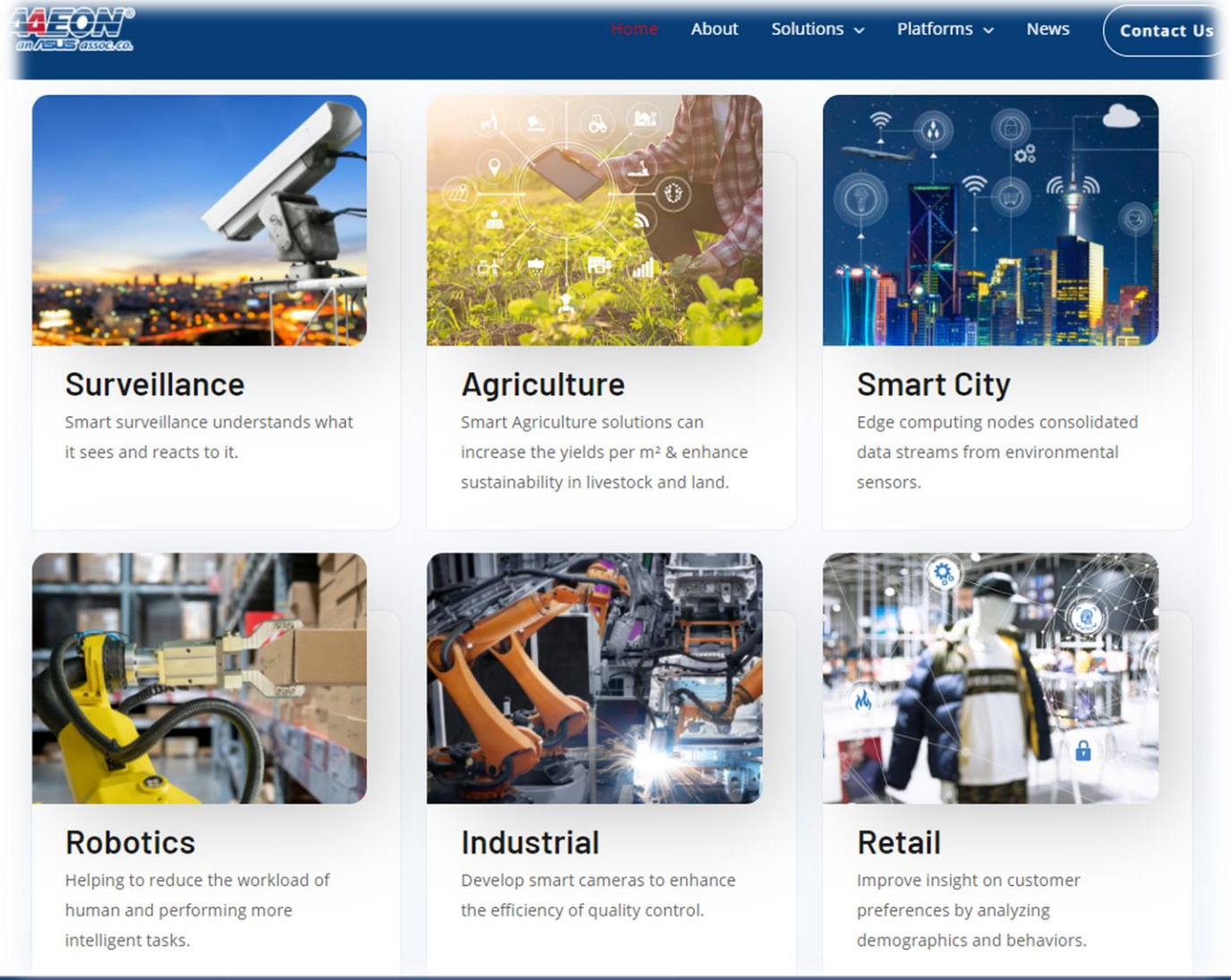
USB 3.2 Gen 1 x 4

Sensor



AAEON's Focus Vertical Markets

Focus • Agility • Competitiveness
www.aaeon.com



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AAEON Spotlight: Q2 2021

Hear from our product experts about the newest products and latest features from AAEON in Quarter 2 of 2021

- **26 May 2021 at 15:00 CET**

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Spreading intelligence throughout a digital world

Contact: Marketing@aaeon.eu

@AAEONEurope

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