



bridge
the gap

Industrial **Maker** Computing platform

自主移動機器人： 前瞻未來工廠新時代



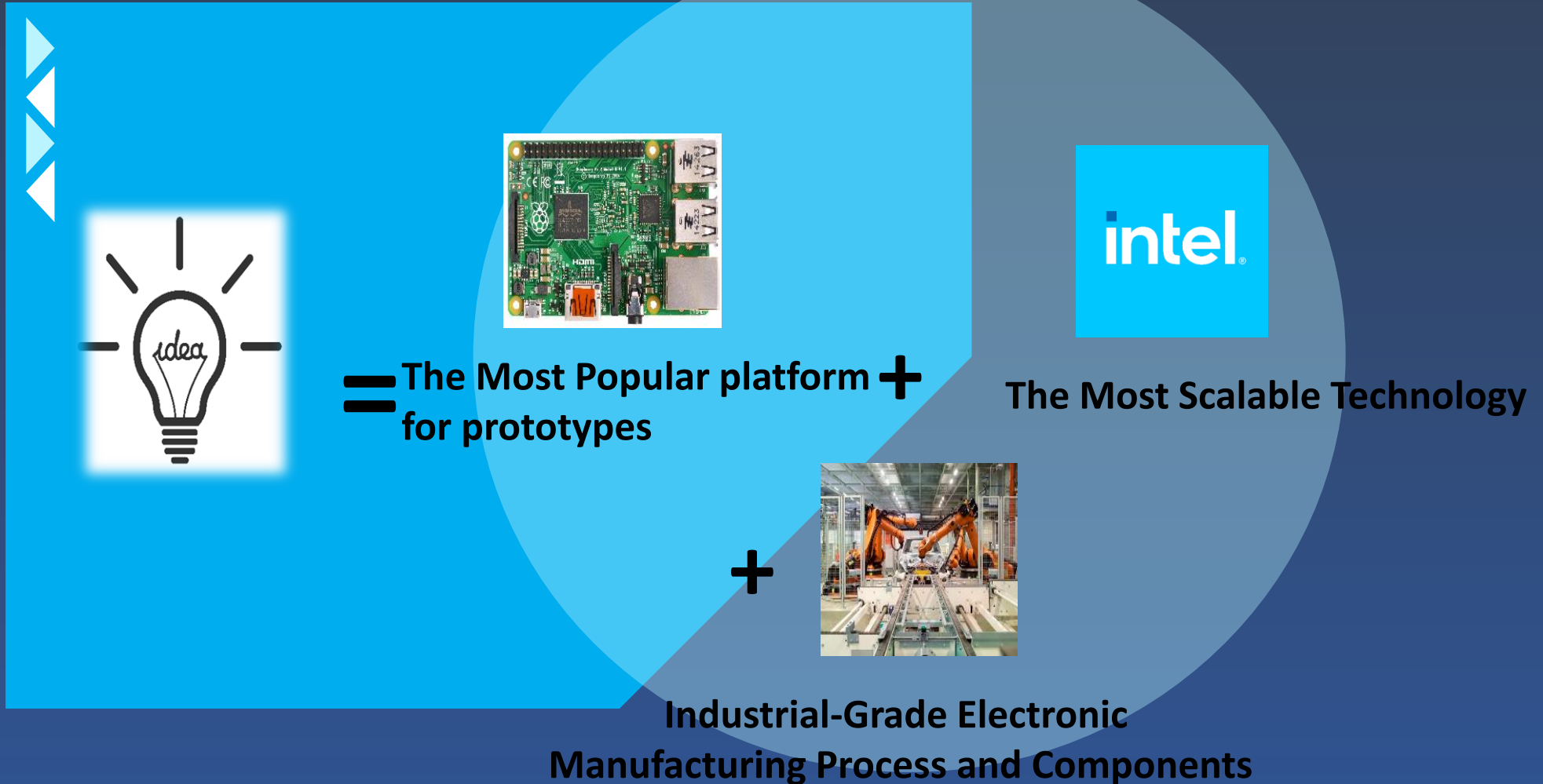
Presenter : 李宏芸(Wendy Lee)

Date : 2023.03.23

The Gap – 創新者 vs 工業開發者

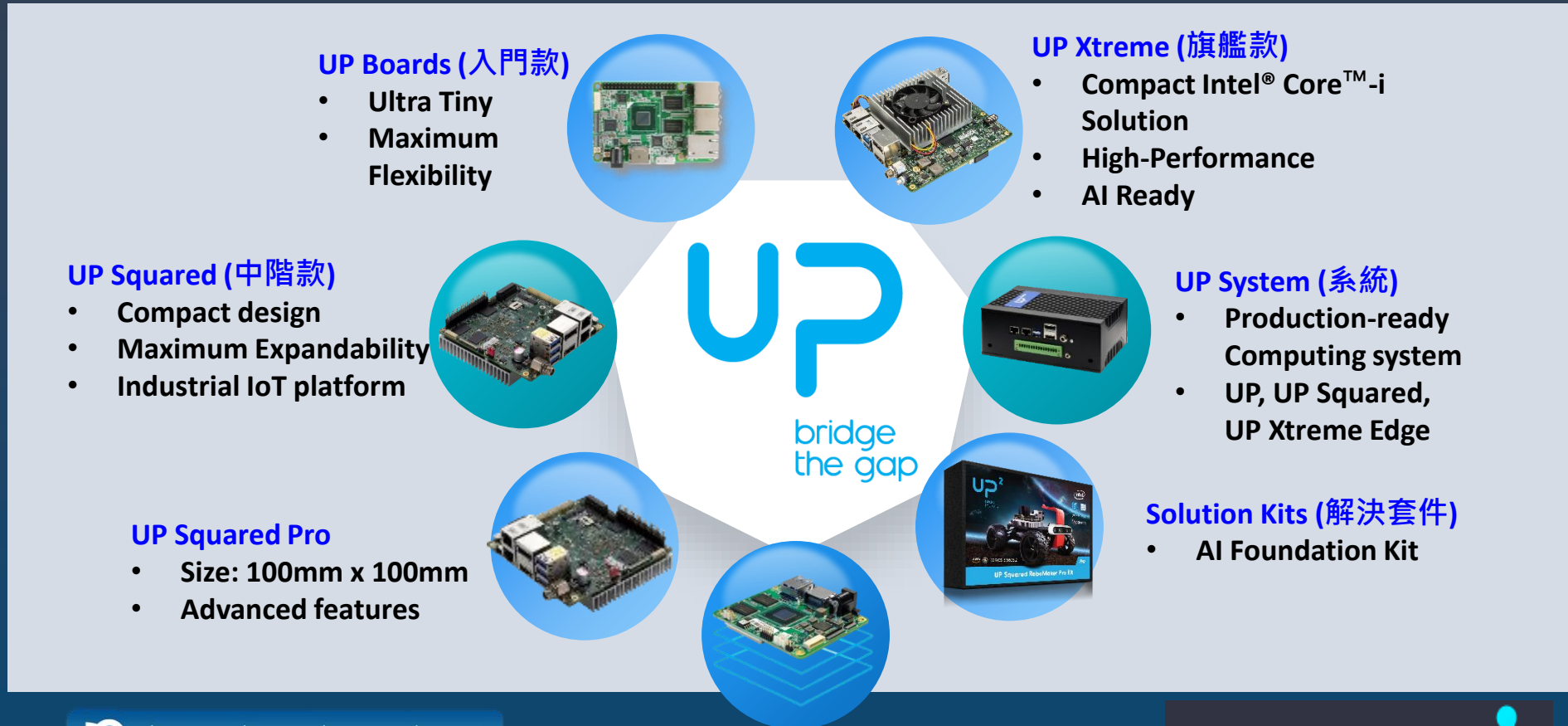


The Idea



UP Bridge the Gap

“工業開發者運算平臺”



Bridge the Gap

Innovation to Reality

UP

- **Products focused on Innovation**
 - Dev kits include the latest Intel® Platforms and Features.
- **Easy to get support, source code and documentation**
 - UP community, UP Wiki, GitHub
- **Suitable also for Mass-Produced products, not only development and POC**

IPC的特色

- 深入討論需求時間
- 交代清楚應用細節
- 長時間討論付款條件
- 等待12周後交貨

- ✓ 1鍵下單
- ✓ 7天內出貨
- ✓ 5年以上產品壽命
- ✓ 24/7工業等級的設計

UP 特色

Focus • Agility •
Competitiveness

消費性的特色

- 最新的產品, 舊商品下架
- 可以在網路上找技術文件
- 便宜的產品設計
- 專人負責大量採購需求

UP 軟體合作夥伴

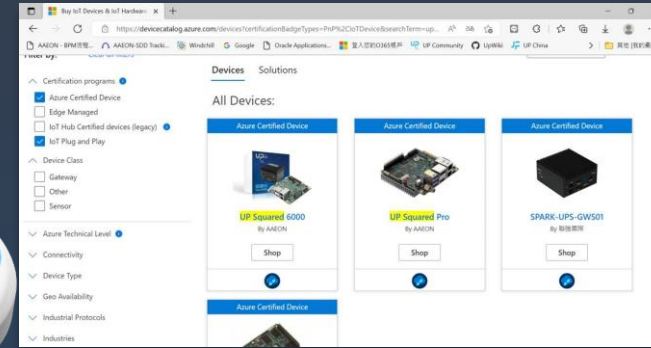
All certified devices

Search in certified devices

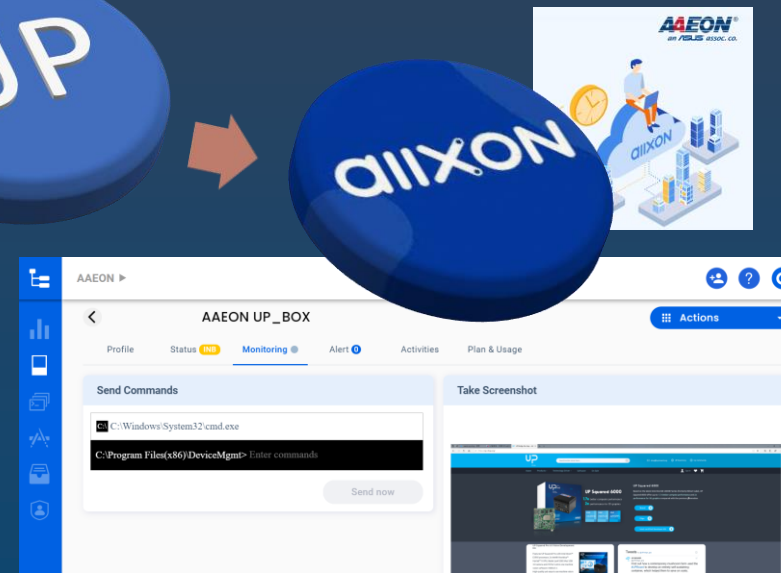
Filter 1 – 3 of 3 results Results per page 20

VENDOR	MODEL	CATEGORY
AAEON Technology Inc.	SSE-OPTI	Device
AAEON Technology Inc.	UP Squared 6000 Edge Computing Kit	Device
AAEON Technology Inc.	UP Xtreme I11 EDGE Compute Enabling Kit	Device

Show all vendors (10) Results per page 20



Ubuntu Certified Devices



UP 自主移動機器人解決方案

AMR 市場概況

The autonomous mobile robot (AMR) market size stood at USD 1.67 billion in 2020, and is expected to reach USD 8.70 billion in 2028, exhibiting a forecasted compound annual growth rate of 23.7%.



e-commerce Growth



Covid-19



Lack of workforce



Why AMR?



Labor Cost Reduction



Avoid Workforce Shortage



Layout Freedom



Modularity or Scalability



Increase Productivity



Avoid Mistakes



Increase Safety



Minimize Infection Risk



Traceability
Inventory Accuracy

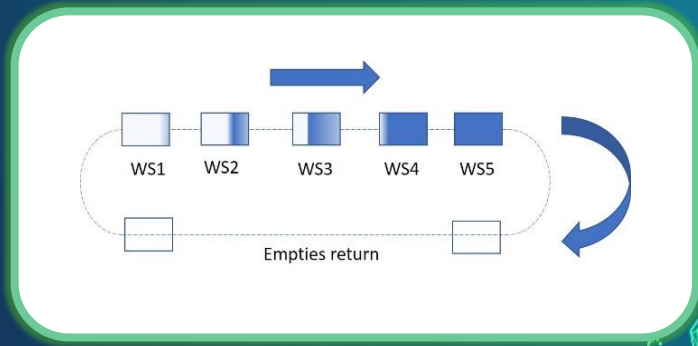
AMR



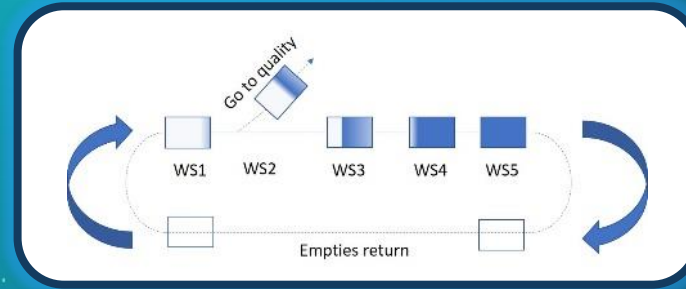
Indirect Cost Reduction



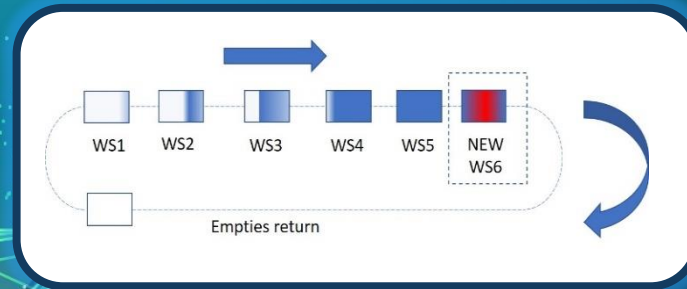
Assembly Line Powered By AMR?



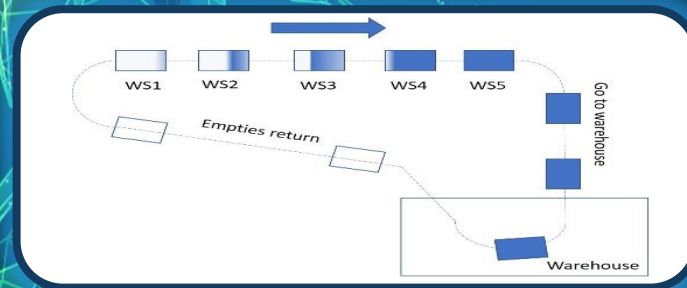
The AMR is the assembly line itself.



Flexibility



Scalability



Interoperability

Possible AAEON AMR Applications



1. Sorting Robot

Classifies and sorts items. For example, trash classification, parcel sorting, returns handling...etc

2. Delivery Robot

Delivers goods to customers. Transports medical samples to avoid human contact.

3. Assistive Robot

Perceives environments, plans routes and interacts with humans to provide assistance. For example, robot processes visitors' registration and leads them to the exact location or directs workers to the production line to start tasks.

4. Equipment Maintenance Robot

Executes repetitive and monotonous maintenance to free up technicians, so technicians can focus on important tasks such as root cost analysis.

5. Robotic Material Handling

Automatically transfers goods to exact locations improving efficiency and reducing the order processing time.

6. Inventory Management Robot

Executes stock checking, item scanning, product replenishment for business units, such as supermarket, factory, warehouse, etc.

Pain-Point For Developing Robotic Projects

Eyes of robot

Video Stream Captured from 3D Camera

Brain of Robot

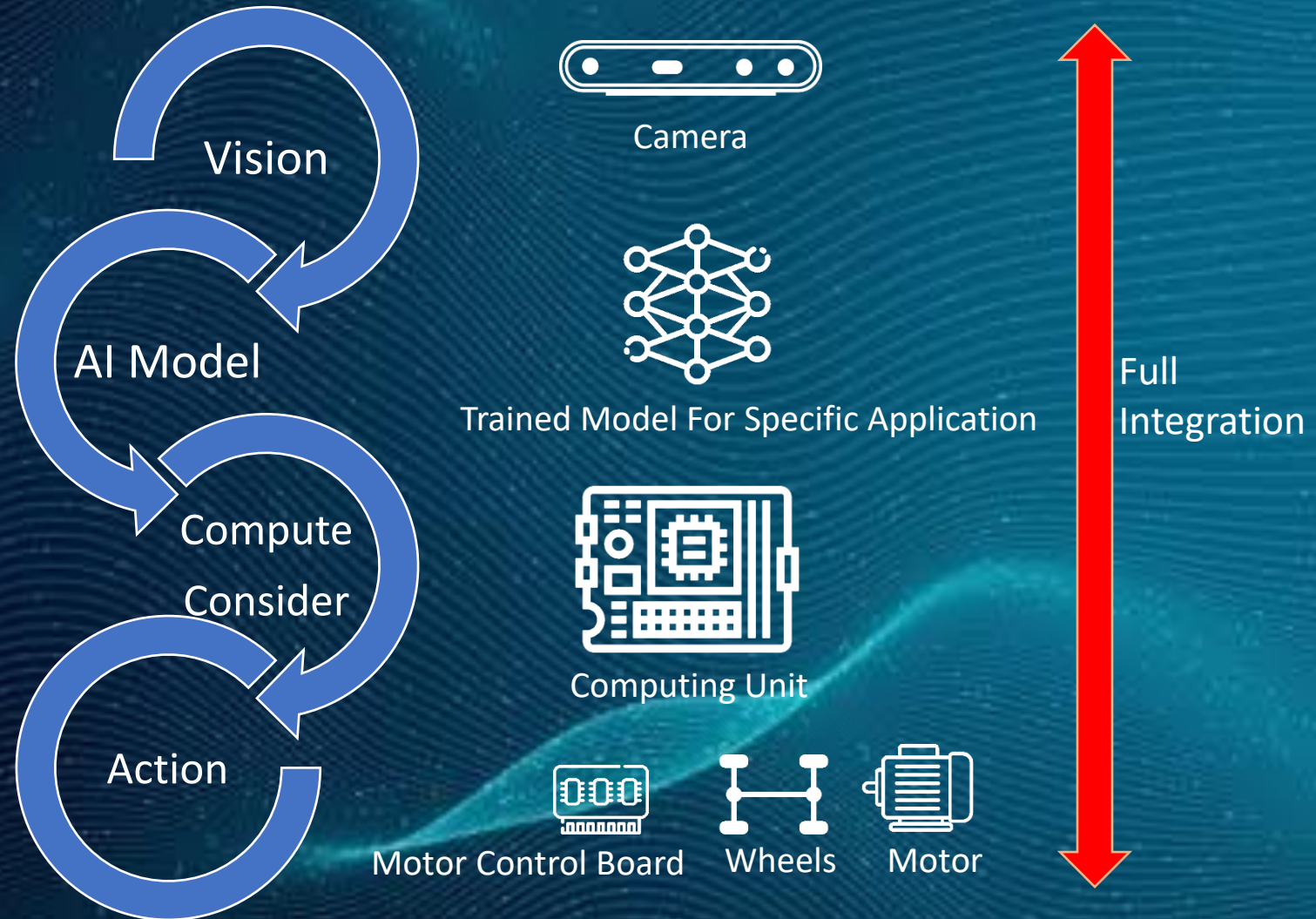
Sophisticated pre trained AI model

+

Computing unit allows robot to understand what it sees and determine correct action.

Foot & Arm of Robot

Robot receives the order and then moves to exact spot and execute action



Why UP Robotic Solutions?

Robotic Applications



AAEON Robotic Solutions

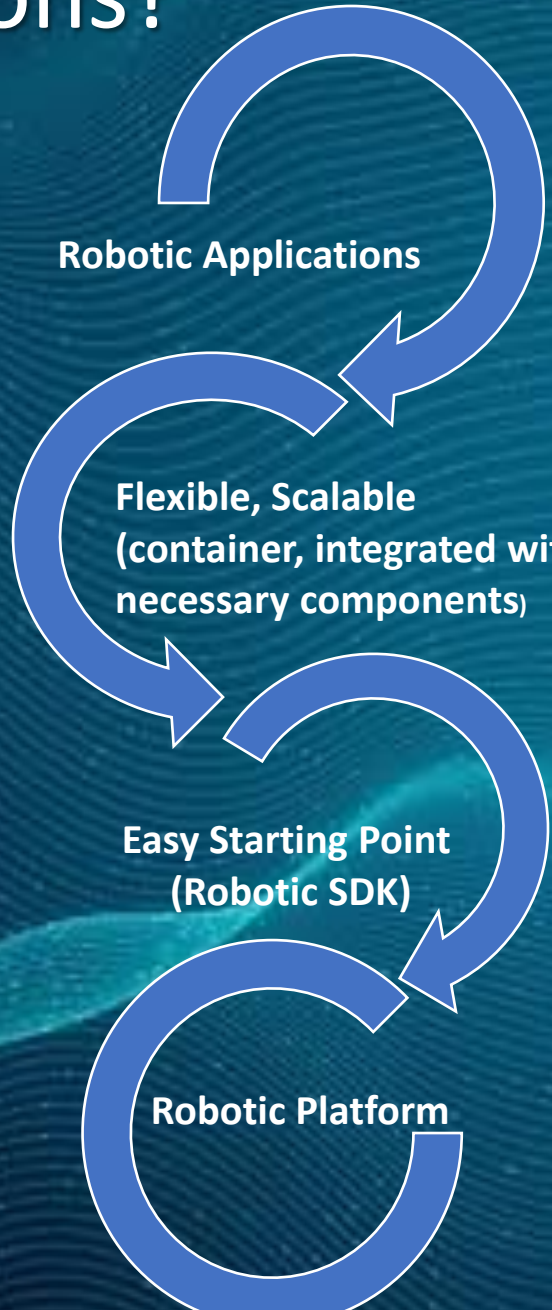


AI & Robotic SDK (Container Supported)

OpenVINO™ intel oneAPI 1 ROS intel. REALSENSE™ 2

AI & Robotics Core

intel. ATOM intel. CORE i3 intel. CORE i5 intel. CORE i7 intel. MOVIDIUS intel. REALSENSE™



AAEON Robotic Solutions Using Intel

AAEON offers multiple robotic solutions using a variety of Intel products:

- Breadth of product availability for hardware and software
- Flexibility across generations
- Support for AAEON platforms



Edge Insights for Autonomous Mobile Robots
OpenVino
[Any other Intel SW used]

UP Xtreme i12 Robotic Development Kit

Hardware Overview

1. UP Xtreme i12 (Spec details)

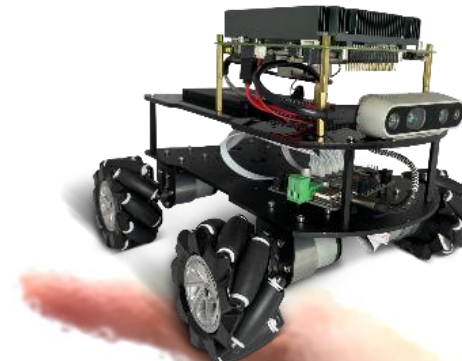
- Intel® Core™ i7-1270PE
- 16GB LPDDL5 (8G x 2)
- 128GB 2.5" SSD

2. Intel® RealSense™ Depth Camera D435i (IMU inside)

3. Intel® AC9260 Wi-Fi Kit (Optional via M.2 2230)

4. Omnidirectional Motor Module:

- 4 Motors
- 1 Motor Control Board: STM32f103rct6
- 1 Wheel Module with 4 Omnidirectional Wheels



Software Overview

1. Ubuntu 20.04 LTS

2. ROS2 – Foxy

3. Intel Edge Insights for AMR

- Intel® Distribution of OpenVINO™ Toolkit
- Intel® RealSense™ SDK 2.0
- Intel® oneAPI Base Toolkit (Base Kit)

OpenVINO™



REALSENSE™
TECHNOLOGY

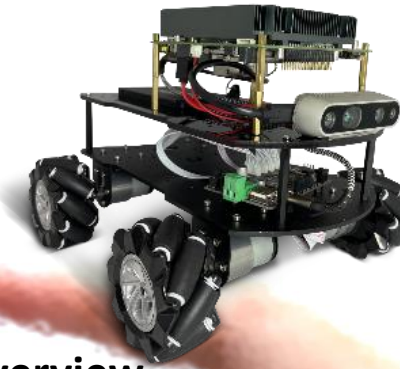
ROS2

1
oneAPI

UP Squared 6000 Robotic Development Kit

Hardware Overview

1. UP Squared 6000 (Spec details)
 - Intel Atom® x6425RE,
 - 8GB onboard DDR4
 - 64GB onboard eMMC
2. Intel® RealSense™ Depth Camera D435i (IMU inside)
3. Intel® AC9260 Wi-Fi Kit (via M.2 2230)
4. Omnidirectional Motor Module:
 - 4 Motors
 - 1 Motor Control Board: STM32f103rct6
 - 1 Wheel Module with 4 Omnidirectional Wheels



Software Overview

1. Ubuntu 20.04 LTS
2. ROS2 – Foxy
3. Intel Edge Insights for AMR
 - Intel® Distribution of OpenVINO™ Toolkit
 - Intel® RealSense™ SDK 2.0
 - Intel® oneAPI Base Toolkit (Base Kit)

OpenVINO™



REALSENSE™
TECHNOLOGY
ROS2

1
oneAPI

A Journey to AMR

the same cores, different appearances



Real Use Cases



Retail Assistant



Home Robot



Hotel/Bank Service Robot



Security Robot



Service Robot

PARTNER WITH 

TOGETHER

WE CAN MAKE A DIFFERENCE

“UP - Industrial Maker Computing platform”

Industrial Maker board ^{User Friendly}

UP DMS

UP- AI solution

UP- 5G

UP- IOT UP- Wi-Fi 6E

Simple

BRIDGE THE GAP

Not only developer, but also Industrial

THANK YOU

A&EON[®]
an **ASUS** assoc. co.

UP
bridge
the gap

Follow us



VISIT WEBSITE