

# Keeping UP with Intelligent Public Health Practices

Industry: Retail, Banking, Business

Product: UP Squared Pro with AI Core XM2280

## Introduction

Even as vaccines begin to roll out, the majority of the world and businesses are still maintaining mask mandates and social distancing requirements to help prevent the further spread of the COVID-19 pandemic. Many governments and businesses also see the value of maintaining such practices in a post-COVID world, continuing good practices to help mitigate the spread of more common diseases such as the seasonal flu.



A leading systems integrator specializing in AI solutions and services, recently set out to develop a system for detecting face masks as well as measuring social distancing. This kind of application has seen deployment in hospitals, train stations, and more, where a network of devices connect to help detect, track, and warn facility managers of possible incidents. However, there is often concern with this type of system, which requires utilizing facial recognition to track violators, and whether or not these systems log and store data on individuals.

The SI offers a simple solution, which involves a single system generally deployed in smaller numbers or individually. It doesn't retain facial data nor perform facial recognition or tracking. Instead of alerting staff to track down an incident, the system immediately notifies staff and shows a light to make people aware of possible mask and social distancing violations. This helps anonymize the "offender" and is perfect for use in smaller spaces where the need to track someone isn't important.

However, the SI needed a hardware platform solution to power their innovative system. With several key requirements and challenges to overcome, they turned to AAEON and the UP Squared Pro with AI Core XM2280.

## Challenges

In order to power their system, the SI needed a solution that could overcome several key challenges. They needed help with designing a customized system, needed the board and components to be compact, and needed AI computing performance to run both face mask and social distancing detection at the same time.

## Capable AI Performance

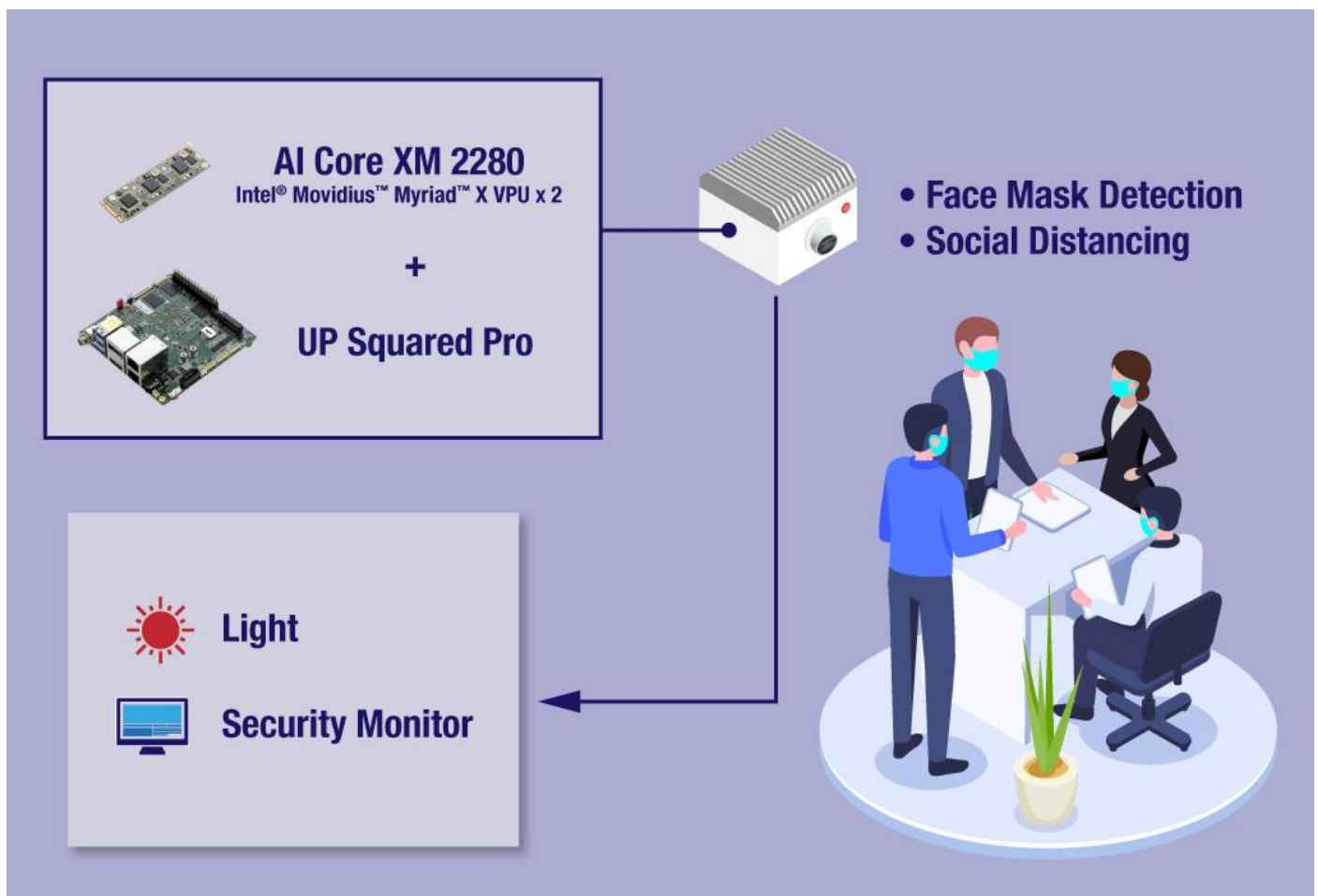
To be an effective system, the solution needed to power two AI inferences at the same time. AAEON offered a customized AI Core XM2280 with Intel® Movidius® Myriad™ X to help scale up the performance needed to power both face mask recognition and social distancing monitoring simultaneously.

## Compact Deployment

Many customers and clients required a system that could be installed just about anywhere and be as inconspicuous as possible. For this, the SI needed a solution that is compact. The UP Squared Pro is a mere 101.6 mm x 101.6 mm with low profile, allowing it to fit in any tight space. Additionally, it can be deployed with a fan-less thermal solution, eliminating noise and reducing maintenance requirements.

## Custom Built System

The SI needed a solution that was all-in-one with board and camera integrated into a single system. AAEON manufacturer services provided the necessary OEM/ODM work and mechanical design to fit camera, Up Squared Pro board and AI Core XM2280 with all necessary wires and custom thermal solution to deliver a platform that was fan-less with all the components required.



## AAEON Advantage

With the UP Squared Pro with AI Core XM2280, AAEON offered several key advantages over competitors to put the SI's system ahead of the game. On-board TPM 2.0 offers enhanced data security to further improve upon their requirements for privacy compliance, flexibility for the SI to connect proprietary devices, and compatibility with Intel® Distribution of OpenVINO™ toolkit to make deploying their AI models even easier.

### Data Security with TPM

The UP Squared Pro helps to enhance data integrity and security with on-board TPM 2.0. This ensures data is accurate and reliable, while also providing an extra layer of data security. The SI is able to leverage this technology to help provide additional protections for privacy concerns.

### Flexible, Expandable

The UP Squared Pro offers a flexible I/O layout to allow the SI to deploy the system with proprietary devices, including an LTE USB dongle. Additionally, the board features several expansion slots, making it easy to meet any additional or unique needs a client may request.

### Intel® Distribution of OpenVINO™

Powered by Intel® processor family formerly Apollo Lake, the UP Squared Pro and AI Core XM2280 are compatible with the Intel® Distribution of OpenVINO™ toolkit. The OpenVINO toolkit helps developers and systems integrators quickly deploy their models and optimize them for the Intel AI Edge ecosystem.

## Impact

With the power and flexibility of UP Squared Pro with AI Core XM2280, the SI is able to deliver their application quickly to customers. The support of AAEON and leveraging the advantages of the Intel ecosystem allowed the SI to reduce their development time and bring their platform to market sooner. Additionally, they are able to offer their customers customized systems to meet individual deployment needs.

Smaller businesses, such as banks, can also take advantage of the compact system to finally bring an intelligent way to enforce mask requirements and social distancing without the investment in more expensive edge systems. With the system in place, businesses can ensure safe and healthy practices and help reduce the spread of disease. Additionally, they can rest assured of not running afoul of any privacy regulations, reducing further financial costs.

## Product

The UP Squared Pro offers developers an up to date platform based on the popular UP Squared board, with greater expandability and I/O features. The UP Squared Pro is powered by the Intel® Celeron® N3350, Pentium® N4200 and Atom™ E3950 processors (formerly known as Apollo Lake) with up to 8GB of onboard memory. The UP Squared Pro provides greater expandability thanks to three M.2 slots, including M.2 2230 E-Key, M.2 2280 M-Key, and M.2 3042/3052 B-Key. This enables developers to quickly add on Wi-Fi and AI accelerators, as well as 5G cellular cards, allowing developers to take advantage of lower latency and higher speeds for wireless network deployment.





The UP Squared Pro features dual Gigabit LAN ports, with support for Time Sensitive Networking (TSN). Additionally, the UP Squared Pro is designed with a wide voltage input, 12~24V, allowing operation in rugged environments. The UP Squared Pro also has a 40-pin HAT expansion and offers expandable storage options with SATA III connectors. The UP Squared Pro maintains and grows the familiar UP ecosystem, allowing developers to easily migrate projects from the UP Squared board to UP Squared Pro.



The AI Core XM2280 m.2 module features two Intel<sup>®</sup> Movidius<sup>®</sup> Myriad<sup>™</sup> X VPUS, a low-power high-performance accelerator designed for AI Edge Computing. The AI Core XM2280 delivers speeds up to 200 fps (160 typical) and over 2 trillion floating point operations as a dedicated neural network accelerator.

The UP Squared Pro and AI Core XM2280 are both compatible with the Intel<sup>®</sup> distribution of OpenVINO<sup>™</sup> Toolkit, providing a powerful software suite to help developers get their projects up and running quickly, with support for popular AI frameworks including TensorFlow and Caffe.

Thanks to AAEON's Manufacturer Services, our clients can also enjoy full OEM/ODM support, from customizing existing boards, to providing full end-to-end service from design to testing to mass production. AAEON works closely with partners to help accelerate development and shorten time-to-market.

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