Speeding UP Service with AI Edge Solutions

Industry: Drive Thru, Fast Food, Retail, Service

Product: UP Xtreme and AI Core XM2280

Introduction

With the advances in AI Edge Computing technology, many vertical markets are eager to leverage this technology to improve their products and sales experience for their customers. We usually see various applications deployed in creating Smart Retail and Smart Signage solutions, helping to improve the shopping experience and providing more effective advertising. But how does this technology translate to the service industry, particularly fast-food restaurants?

One popular fast-food chain in New Zealand is rolling out an AI-powered system which combines several key AI technologies from different applications in order to power targeted marketing for their drive thru customers. By combining facial recognition technology to determine the age and gender of each driver along with identifying vehicle make and model, the system can first create a reference of which menu items are the most popular among certain demographics. The system then can use this data to suggest menu items to each driver via digital signage, providing a more tailored customer experience. It can also help track market trends and shifting tastes among different demographics.

A powerful concept needs a powerful hardware platform, so the fast-food chain reached out to AAEON to provide a solution which could power their project. AAEON analyzed their needs and offered the UP Xtreme with AI Core XM2280 module.

Challenges

Operating a Smart Drive Thru which combines digital signage with AI technology presents several unique challenges. AAEON worked closely with the fast-food chain to identify their key requirements and pain points. Knowing the challenges ahead, the UP Xtreme board with AI Core XM2280 module was chosen as the best option for this application.

Powerful Computing

With the range of technologies in place, the fast-food company needed a processor that could handle the many tasks required with the fastest speeds possible. The UP Xtreme board is powered by the 8th Generation Intel® Core™ U processors (formerly Whiskey Lake), delivering high performance processing on a small board. Additionally, the AI Core XM2280 delive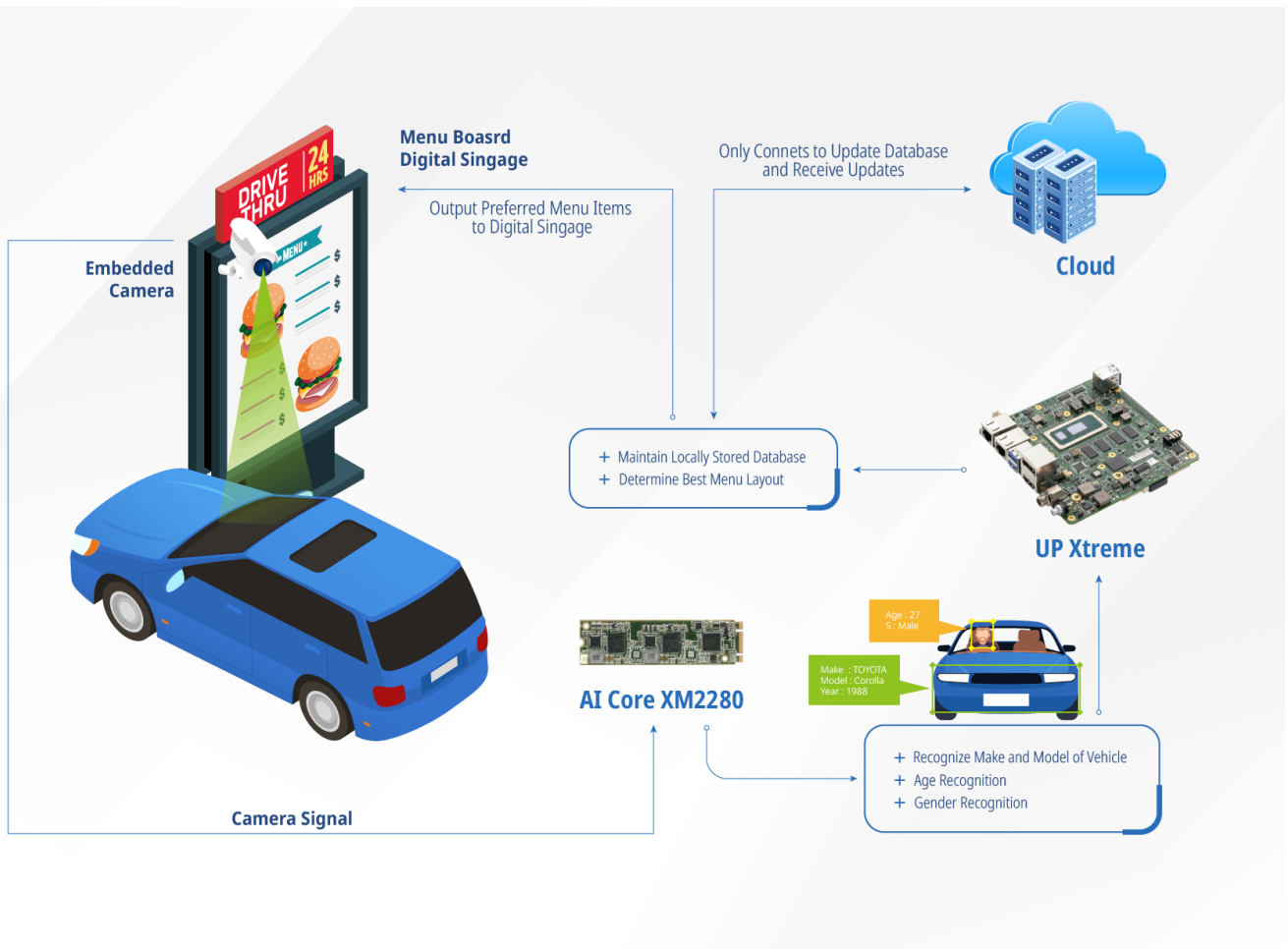rs the AI acceleration needed to power the facial recognition technology, helping offload the tasks from the processor itself.

High Definition Graphics

To effectively deliver targeted marketing, the hardware solution needs to be capable of powering the high-quality graphics needed to entice customers to order suggested menu items. The UP Xtreme board features the Intel® Gen9 embedded graphics processor, allowing the board to power 4K HD outputs with its HDMI 2.0, DP1.2 and eDP connectors.

Low Delay Response

A fast-food drive-thru, as the name implies, requires fast service and ordering. In order to be effective, the hardware solution needs to perform analysis and display the appropriate targeted marketing within a very narrow window. Built for Edge Computing, the UP Xtreme handles all of these tasks right where they're needed, reducing latency by not needed to connect to a remote cloud service.

Advantages

In addition to overcoming the challenges and meeting the needs of the project, the UP Xtreme board with AI Core XM2280 provided several key advantages, making it the perfect fit for the job. Alongside AAEON's industry leading service, the UP Xtreme board with AI Core XM2280 provided rugged industrial design, compact form factor, and support for the Intel® distribution of OpenVINO™ toolkit.

Rugged Industrial Design

While New Zealand isn't known for extreme temperatures, deploying a system outdoors, embedded in the drive-thru signage, still requires a board that can handle a wide range of temperatures and deliver consistent performance. The UP Xtreme can operate in temperatures from -20°C to 70°C, and utilizes components designed to withstand vibration and shock, as well as wide voltage input.

Compact Size

The UP Xtreme board is designed to easily integrate wherever it's needed, from a broad I/O layout to easily connect with cameras and sensors, to a compact design that's easy to fit into any tight space. This allows the fast-food chain to easily install the system into their signage without hassle.

OpenVINO™ Compatibility

The UP Xtreme board and AI Core XM2280 offer developers support and access to the Intel® distribution of OpenVINO™ toolkit. With the Intel Core processors and the two Intel® Movidius® Myriad™ X VPUs on the AI Core XM2280, it is easy to manage, program and optimize a wide range of AI inferences to deliver maximum performance on Intel based solutions.
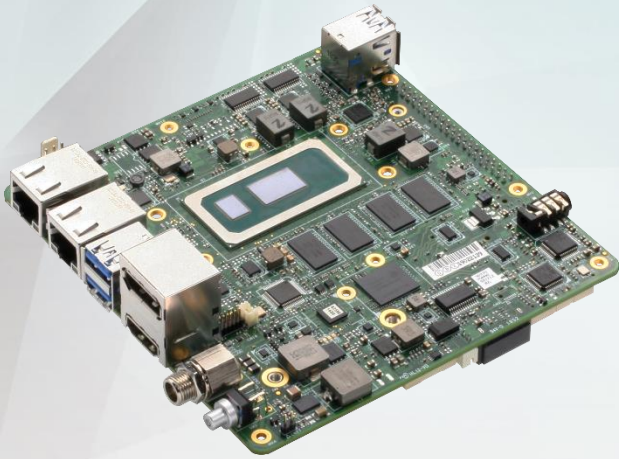
Impact

Thanks to the powerful UP Xtreme board with AI Core XM2280 and AAEON's industry leading service and support, the fast-food chain was able to bring their project from proof of concept to initialization and full deployment. AAEON worked closely with the chain to ensure everything ran smoothly, and integrated properly with their chosen cloud platforms. This provided an accelerated development time with faster time-to-market, allowing the chain to stay ahead of their competition.

With the system in place, the fast-food chain could start collecting the demographic data they needed, and now have the full AI-based Smart Drive Thru operational. With targeted marketing in place, it's easier for the chain's employees to upsell menu items, or even suggest new or limited time meals that may appeal to different diners. Additionally, the chain can capture even finer and more detailed purchasing data across a wide range of demographics.

For their customers, the drive thru experience is greatly enhanced in a way that's almost imperceptible. Learning of new food items or even others they might have forgotten about, helps customers to experience a wider selection of the menu without feeling pressured by the drive-thru operator.

AAEON Solution

The UP Xtreme is the third generation of UP Board products, powered by 8th Generation Intel® Core™ and Celeron® processors (formerly Whiskey Lake) with up to 16GB of onboard RAM and 64GB of eMMC memory to power through any application. With built-in Intel® graphics solution, the UP Xtreme is capable of 4K video output, and features a built-in audio jack as standard.
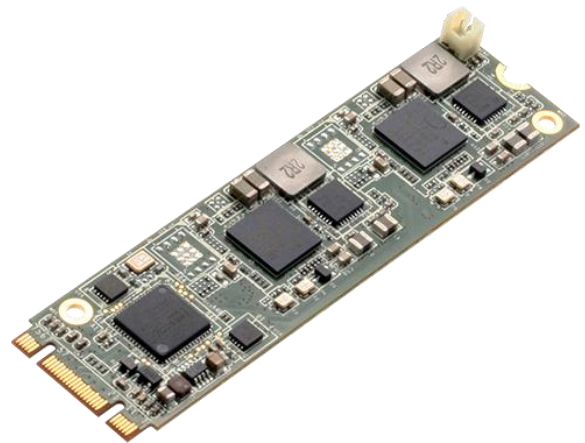
The UP Xtreme brings industrial grade features to the UP line of products, such as 12~60V wide voltage power input, two RS232/422/485 10-pin headers, and time sensitive networking (TSN) to facilitate communication in a connected factory. The UP Xtreme is also built to perform in temperatures ranging from 0°C up to 60°C.

The UP Xtreme offers flexible expandability with both a 40-pin and 100-pin connector, as well as m.2 2230 and 2280 slots, and mPCIe slots. The UP Xtreme can be expanded with wireless modules for Wi-Fi, Bluetooth, 4G and LTE. The UP Xtreme is compatible with other UP Board modules, including the AI Core X, AI Core XM 2280, and Vision Plus X, all featuring the Intel® Movidius™ Myriad™ X. With each module installed, the UP Xtreme supports up to six Intel® Movidius™ Myriad™ X modules, providing high-performance AI processing for edge computing applications.

The AI Core XM2280 m.2 module features two Intel® Movidius® Myriad™ 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 Xtreme and AI Core XM2280 are both compatible with the Intel® distribution of OpenVINO™ 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.

CONTACT US

AAEON Technology Inc.

5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien Dist, New Taipei City, 231, Taiwan, R.O.C.

+886-2-8919-1234

+886-2-8919-1056

FOLLOW US

www.aaeon.com