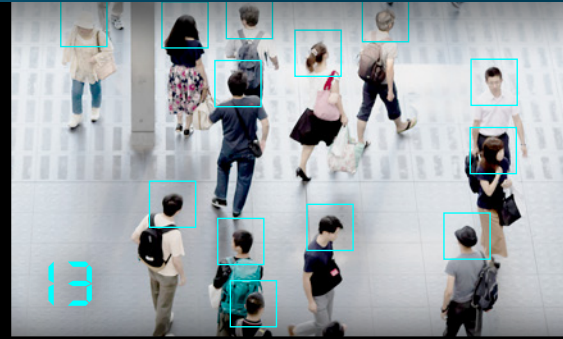




AI Vision Crowd Monitoring System

IEI's TANK and VPU Keeps Crowds In Check

Overview

Crowds. Congestion. And the possibility of serious incidents or chaos if not kept in check. Monitoring crowds is vital for maintaining a close check on current conditions and avoiding the problems posed by large groups of people.

Now, there's a new angle on crowd monitoring. In the wake of COVID, there is a greater awareness of social distancing and the need to wear masks in public to reduce the spread of the virus. Monitoring and enforcing these new rules for public life, even with ubiquitous CCTVs, is difficult with limited human resources and the size of public spaces. CCTV monitoring fails to scale. It is becoming impossible for safety personnel to monitor all the incoming video streams from multiple viewpoints. And attention spans are limited. In most cases, the footage is only used to review events rather than provide real-time alerts.

Computer vision technologies, powered by AI, provide a powerful digital solution to crowd management. The specialized AI computer connects to many cameras and uses AI technology to analyze the video stream and identify potential crowd issues in real-time.

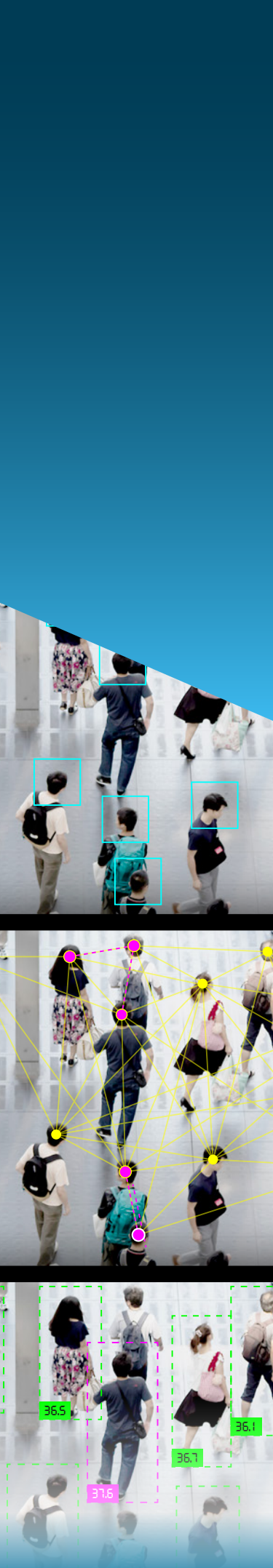
Introduction

Our client, a system integrator operating in India, needed a rock-solid industrial computer with the hardware and processing power needed to implement a crowd monitoring system for their customer. They needed to provide a monitoring system that could detect the following situations and issue alerts in real-time.

- **Crowd counting** to estimate crowd size, count people in a specific region, and the whole video stream
- **Crowd flow** to determine the direction of the crowd, and monitor queues, throughput, and waiting times
- **Activity detection** to detect hawking, smoking, or other unauthorized activities
- **Anomaly detection** to detect abnormal motion like a vehicle going through a pedestrian area

System integrators must already solve a lot of other technical challenges. They don't want to build a different computer from scratch every time and prefer a computer that does almost everything they need right out of the box.

The computer couldn't just be powerful. It must withstand the rigors of daily use in high temperatures, offer flexibility for system upgrades, and most importantly, be easy for the integrator to set up and deploy.



Problem

Compact

Computers with enough processing power for AI applications tend to be significant. Large systems are needed to support power-hungry CPUs and high-powered expansion cards. These drive up the heat, necessitating bigger cooling systems. With large size and cooling requirements, the computer ends up taking too much space. The challenge is providing sufficient power while keeping the system as small as possible not to become cumbersome.

Expandable

There's a balance to accommodating expansion while keeping the system compact. Having too much unused space is a waste, but not having enough causes problems down the line. PCIe slots are necessary to support the powerful GPU, VPU, and LPGA cards with the parallel processing power required for modern AI applications. On the flip side, there are lots of legacy connectors still used in industrial applications. Modern computers often lack these legacy connectors needed for any computer to be useful in the broadest range of applications.

Reliable

Powerful computer systems with big fans to keep the internal components cool are susceptible to overheating and fan breakdowns. This issue increases when adding vision processing cards - that draw a lot of power and produce a lot of heat - to the mix. Many modern systems are not designed for use outside temperature-controlled environments, whereas AI systems are often installed outside these carefully controlled areas.

Solution

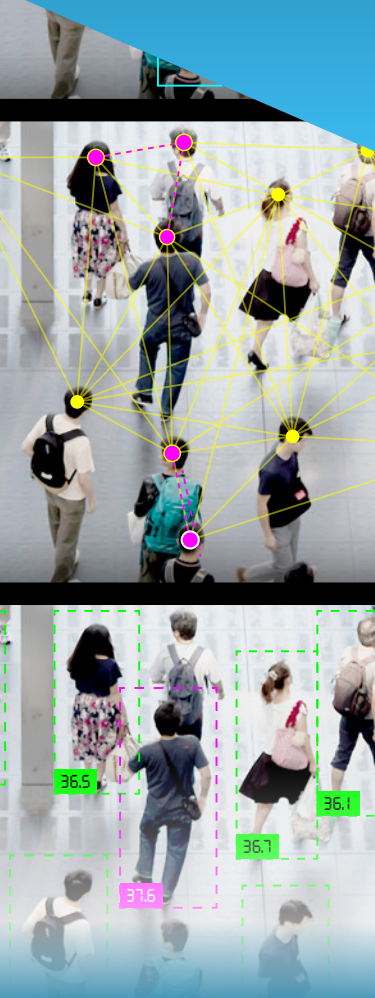
The TANK-870 is a tough and rugged industrial AI computer system designed with the widest range of support for legacy connectors, a comprehensive assortment of modern connectors, and PCIe expansion slots for vision processing cards. The MUSTANG-V100 is IEI's PCIe vision processing card with Intel Movidius Myriad VPU chips precision-designed for vision processing applications.

The TANK-870 industrial computer for AI packs all the punch of a larger system, but in an unassuming space-saving size. It is compact enough to make it easy for integrators to install the computer in tight spaces. The deep-finned aluminum chassis provides ample heat dissipation for a low-heat system, while a vent on the rear allows excess heat to escape. Its built-in GbE provides the connection to the IP cameras that provide the video input. The system also has the critical PCIe expansion card slots for the two MUSTANG-V100 cards.



TANK AIoT Developer Kit

- 6th/7th Gen Intel® Core™/Xeon® processor platform
- Dual independent display
- Support 2 x PCIe x8 Slot and 2 x 1GbE LAN
- Pre-installed Intel® Distribution of OpenVINO™ toolkit



Features include:

- Intel® Core™ i7-6700TE or i5-6500TE
- DDR4 SO-DIMM, up to 32GB
- Shock and vibration protection
- 2x GbE LAN
- VGA, HDMI/DP
- 2 x PCIe x8
- Op. temp. -20 to 60°C (i5 CPU)

That's still not enough punch for AI processing, which requires parallel processing capabilities only efficiently achievable with add-on cards. Up to two MUSTANG-V100 vision cards support up to 16 IP cameras while packing enough power for multiple AI functions.

Features include:

- 8x Intel® Movidius™ Myriad™ X MA2485 VPU
- PCIe x4 (v2.0)
- Power Consumption about 25W
- Op. temp. -20 to 60°C

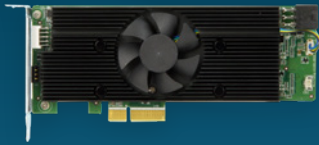
AI computer power is nothing without the software to back it up. The system supports the widely used OpenVINO framework so that algorithms can be rolled out onto the Intel hardware quickly and easily. For current or future cloud computing needs, the TANK-870 is AWS qualified, and Microsoft Azure certified.

Result

Easier installation. The TANK-870 fits into small spaces without sacrificing the critical computer processing power it needs to tackle complex computational tasks. Integrators can worry less about the computer and focus more on implementing the mechanics of the rest of the system.

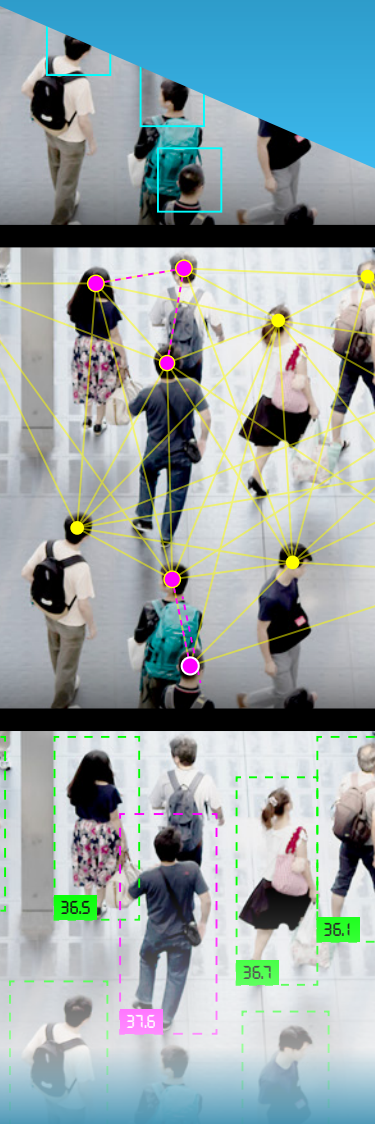
One computer, multiple applications. The TANK-870 provides all the legacy connectors an integrator could want, all the modern connectors they could want, including GbE, and two PCIe expansion card slots for the GPU, VPU, and FPGA cards that are so critical for AI processing. Together, these features allow the TANK to accommodate applications of any size, from small stores to major shopping centers and malls.

Rock-solid quality saves time, which means integrators spend less time repairing and more time rolling out new projects. With computer uptimes that far exceed the typical computer and with remote management possibilities, integrators and their customers can rest assured that the TANK-870 and MUSTANG-V100 will keep operating at optimal performance into the foreseeable future.



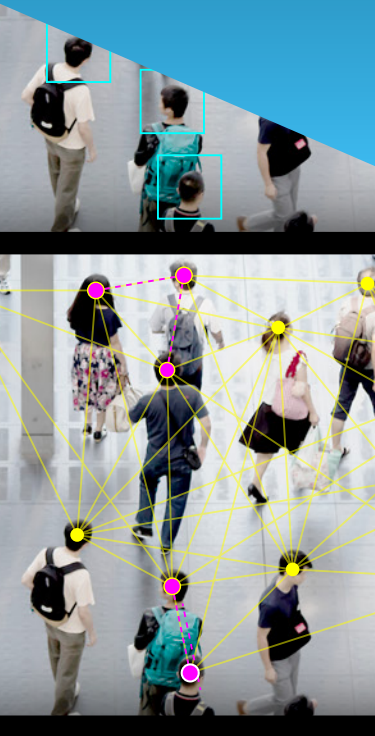
Mustang-V100-MX8

- Eight Intel® Movidius™ Myriad™ X VPU
- Half-Height, Half-Length, Single-slot compact size
- Low power consumption, approximate 25W



Product Selection Guide

IEI Integration Corp. builds up the business as a leading industrial computer provider, and turns to artificial intelligence and networking edge computing. IEI's products are applied in computer-based applications such as factory automation, computer telephony integration, networking appliances, security, systems, and in fields like AI, IoT (Internet of Things), national defense, police administration, transportation, communication base stations and medical instruments. IEI continues to promote its brand products as well as serving ODM vertical markets to offer complete and professional services.



TANK AIoT Developer Kit



- 6th/7th Gen Intel® Core™/Xeon® processor platform with Intel® Q170/C236 chipset and DDR4 memory
- Dual independent display with high resolution support
- Rich high-speed I/O interfaces: USB: 4 x USB 3.0, 4 x USB 2.0 ; Ethernet: 2 x RJ-45 ; COM Port: 4 x RS-232 & 2 x RS-232/422/485 (DB-9)
- Flexible Expansion with 2 x PCIe x8, 1 x Half-size PCIe Mini slot & 1 x Full-size PCIe Mini slot
- Support wide operating temperature -20°C ~ 60°C
- Pre-installed Intel® Distribution of Open Visual Inference & Neural Network Optimization (OpenVINO™) toolkit, Intel® Media SDK, Intel® System Studio and Arduino® Create

[More info...](#)

Mustang-V100-MX8



- Eight Intel® Movidius™ Myriad™ X VPU can execute multiple topologies simultaneously.
- Half-Height, Half-Length, Single-slot compact size
- Low power consumption ,approximate 25W
- Supported OpenVINO™ toolkit, AI edge computing ready device

[More info...](#)

To find out more, please fill out the sales inquiry form and you will be contacted shortly by an IEI sales representative. Thank you.

[Sales Inquiry](#)