Neousys Technology

Imagery Recognition and Automation

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Imagery Recognition & Automation for Harbor Cargo Ports

General overview

Through technological advancements in the past few decades, industrial automation has brought safety, consistency, efficiency and increased productivity. As most major ports around the globe, millions of tonnes of cargo come and go each year. To increased efficiency and up-scale port operations, machine-based learning/ recognition and automation need to be introduced. The introduced system needs to recognize container number, truck license plate, hazardous placards, container hull damage, etc. to efficiently automated container flow in and out of the port. By introducing such a system, safety is a side bonus as it removes human labor where possible, avoiding exposure to risks, hazardous materials, harsh environment and long working hours that may result in fatigue

Problem-solving

One of our customers' applications is set at cargo ports and terminals where thousands of containers come and go daily. The hardware implementation must meet prerequisites such as withstanding extreme weather conditions and being small and light enough to be mounted/ installed on parking lot gates. The solution recognizes the truck license plate, container number/ placard, cross-checks for verification, scans the container hull for damage as it passes and controls the boom gate.

License plate recognition

Container number recognition

Gate automation

Problem solved

The Neousys system is installed on-site with wireless communication, cameras and relay actuators connected. Trucks' license plates entering/ leaving the port dock area are scanned; containers entering/ leaving the port dock area are scanned, coupled with the machine vision software recognition system where the recognition precision rate is up to 99% accurate. Upon dock departure, each truck's license plate will be scanned as well as its onboard container, the system determines if the truck and the container match, before activating the boom gate. The machine vision images are processed by neural network image processing algorithms and the collected data is sent wirelessly to the central computer at a remote site.

Role of Neousys System

The above illustration shows Neousys POC controller in local system implementation. The connected PoE/ USB camera is responsible for machine vision and with the client's software recognition system that has extremely high accuracy. The collected data is processed by deep neural network image processing algorithms before being sent to a remote central system wirelessly. This local system accurately identifies the vehicle license plate and its carrying cargo at the gate, once confirmed, a relay signal will be sent to the automated boom gate system. This system helps thousands of vehicles and containers come and go from the port area around the clock, with minimum manpower deployed at the site.

Benefits of Neousys POC series

Neousys compact rugged embedded platforms offer the following advantages:

Environmental

- Extreme rugged computers for extra volatile environmental conditions
- True -25°C up to 70°C wide-temperature operations for harsh, volatile environments
- Compact dimensions to fit into tight spaces

Connectivity/ expandability

- PoE+ connectivity for GigE cameras
- USB3.1 Gen1/ Gen2 connectivity for USB cameras
- Connection ports with screw-lock for rugged connectivity
- WiFi 6/ WiFi 5/ 5G/ 4G wireless communication, expansion via mini-PCIe module
- Connection ports with screw-lock for rugged connectivity
- Neousys patented MezIO expansion for extra USB, PoE, COM, etc.

Inference processing power

- Support up to dual Google Tensor Processing Unit (TPU)

Electrical

- Wide-range 8 to 35V DC input
- Configurable intelligent ignition power control

Some features may be model-specific, please refer to the Neousys website for details.

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