# Intelligent Transportation System Case Study

Overview

Autonomous vehicles and intelligent transportation systems, such as those employing AI-enabled Network Video Recorders, share a common reliance on sophisticated computational systems. Both require real-time processing of vast amounts of data, leveraging deep learning models to make split-second decisions. Just as Autonomous vehicles depend on advanced processing units for sensor data fusion and real-time decision-making, NVRs with edge AI capabilities can process video streams in real-time, performing tasks like object recognition and behavior analysis.

With the advancement of artificial intelligence and machine learning technologies, autonomous driving and NVR in transportation have become popular features in smart cities across the globe. Related applications are widely supported by local officials around the world as they improve safety, convenience, and energy efficiency in transportation.

The E-Mark certified FPC-5211 series provides the high-precision processing power necessary for complex calculations and analyses in both Autonomous vehicles and AI-enhanced NVR systems. This computational prowess is essential for enabling both to navigate dynamic environments safely and efficiently.
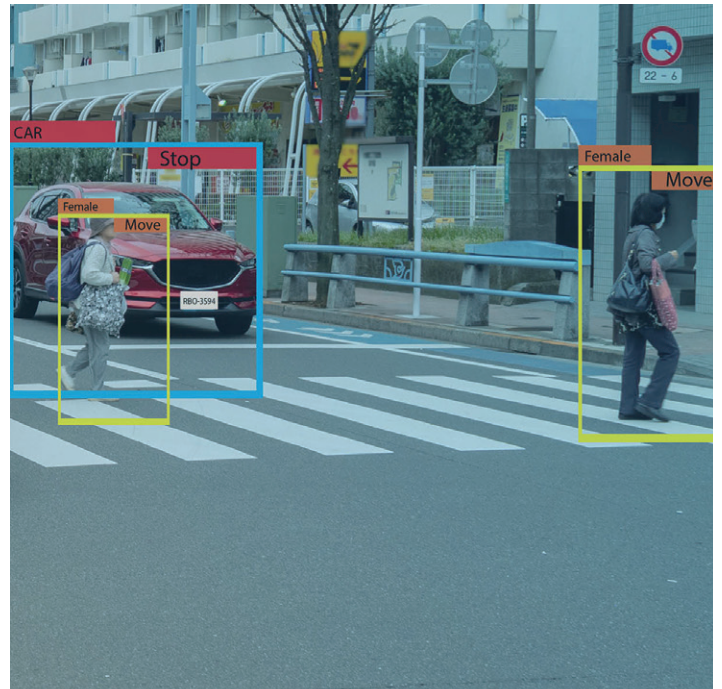
Autonomous Driving

A French company, NAVYA, has introduced a new self-driving bus service that operates in specific areas, providing a convenient transportation option for citizens and tourists. These buses are equipped with multiple sensors that enable the self-driving system to detect the surrounding environment and calculate the direction and speed of travel. During the trial period, the autonomous buses successfully transported an average of 500 passengers per day, operating safely and efficiently.

Cities such as Phoenix and Los Angeles in the U.S. also have autonomous vehicle services on the road, with a various of sensors and computers for fast and stable computing, making the trial operation safe and stable.

In order to handle the complexity of autonomous vehicle systems, multiple embedded computers are required for the infrastructure, vehicle, and central control. These computers are responsible for receiving, storing, processing, transmitting, calculating, and analyzing all the data collected by sensing devices such as LiDAR, cameras, radar, ultrasound devices, GPS, INS (Inertial Navigation System), and communication systems are used for V2X integration. To handle the huge and real-time workload, industrial-grade computers are required to ensure robustness and stability.

Autonomous Driving Diagram

RSU
OBU

I2I
RSU 2 RSU
V2V
V2R / R2V

RSU
RSUC
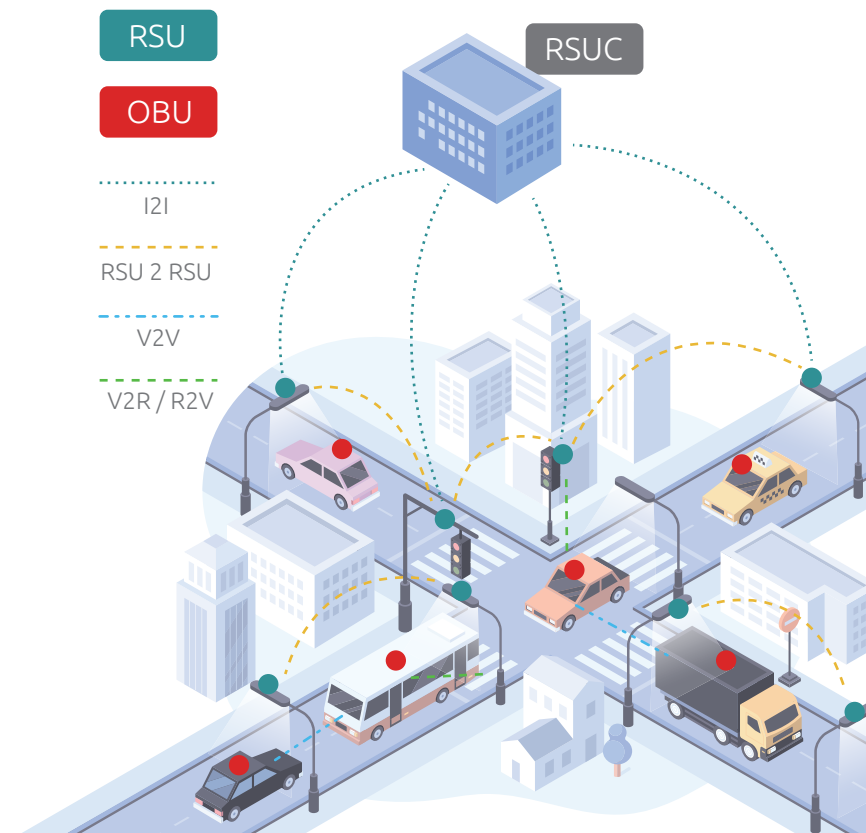
Edge AI on NVR

With our past success in integrating LiDAR technology, and rich experience in integrating systems into European transportation vehicles, ARBOR Technology has successfully deployed the edge computing-capable, E-Mark-certified FPC-5211 into the NVR system of European transportation agencies. In terms of public transport safety, it represents an important milestone.

Advantage

Boosting Accuracy
AI algorithms deliver unparalleled accuracy in identifying individuals, license plates, and objects in videos, minimizing errors and ensuring reliable results.

Proactive Event Monitoring
With AI, you can proactively monitor video streams for anomalies, receiving instant alerts for swift response to security threats.

Smart Search and Playback
AI-powered search capabilities enable you to quickly find and replay specific video clips, saving valuable time and effort.

Data-Driven Insights
AI analyzes vast amounts of video data to provide actionable insights, empowering you to make informed decisions and improve overall security.

Freeing Up Human Resources
By automating routine tasks, AI frees up your staff to focus on more critical and strategic initiatives.

FPC-5211 Series

Intel® 14th / 13th Gen. Core™ Fanless Edge AI Computer supporting NVIDIA® RTX A2000 GPU

- Compatible with the Intel® OpenVINO™ toolkit
- Fanless design (Embedded heat pipes cooling solution)
- Up to 60W GPU MXM module expansion
- DP x2 + HDMI x 1 and DVI x 1 (support 4 independent displays)
- Power on/off delay control / configurable ignition power control
- Supports TPM 2.0 and Time-Sensitive Networking (TSN)
- Front-accessible I/O support
- E-Mark certified