

Sub Millisecond Obstacle Avoidance

Industry: Robotics & Automation

Hardware Acceleration and Vision Pipeline optimization. Klyff Engineers know hardware specific SDKs to solve the most compelling problems for the best ROI.

The Problem

A warehouse robotics company was using NVIDIA Jetson Orin modules but couldn't achieve the 60 FPS required for high-speed navigation while running three different neural networks (depth, object detection, and path planning).

Solution

The "Hard Tech" Solution: Klyff engineers performed **layer-wise INT8** quantization and wrote custom TensorRT plugins to optimize the memory pipeline. We moved the pre-processing of image data from the CPU to the GPU/NPU using specialized GStreamer pipelines.

1. Hardware

- **Main SoC:** NVIDIA Jetson AGX Orin 64GB (the gold standard for high-performance edge AI).
- **Co-Processor:** Hailo-8 AI Accelerator (delivering 26 TOPS at only 2.5W).
- **Vision:** Stereo Depth Cameras (e.g., Luxonis OAK-D) or Ouster LiDAR sensors.

2. Software

- **Optimization:** TensorRT (NVIDIA's inference engine) and Hailo Dataflow Compiler.
- **Pipeline:** NVIDIA DeepStream SDK (for GStreamer-based multi-stream processing).
- **Middleware:** ROS 2 (Robot Operating System) for the control loop, optimized with DDS (Data Distribution Service) for low-latency communication.

Results



Drop in latency from
45ms to 12ms

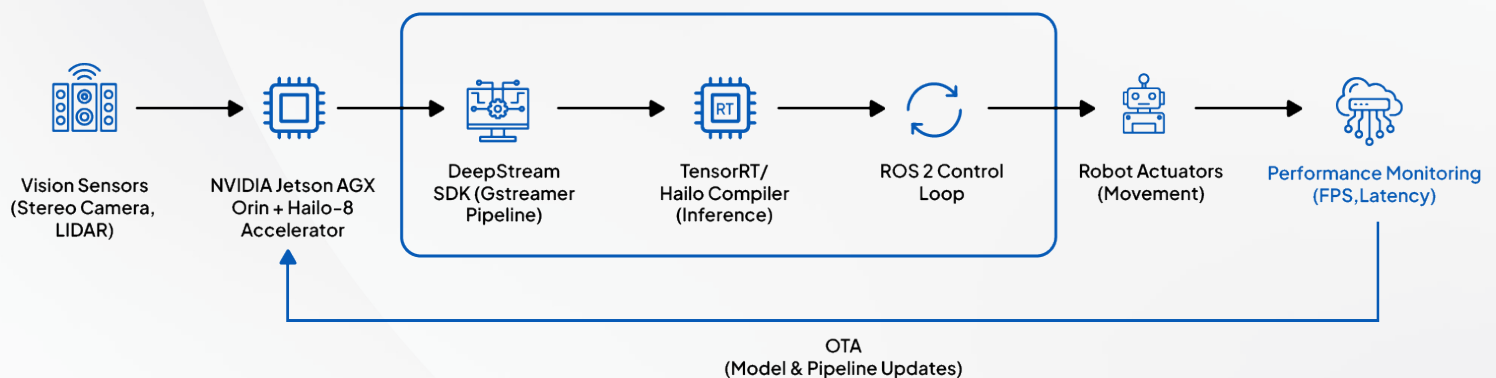


Robots move **3x faster**
through the warehouse
safely



Ultra low power consumption, high model accuracy and low
communication cost.

Solution Flow



Let us help you with predictive maintenance

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