

Transforming Automotive Production with Autonomous Navigation Capabilities

About The Client

Our client, a global pioneer in innovation and sustainability, transforms the automotive industry by designing and manufacturing vehicles that elevate travel experiences and set new standards in performance, safety, and luxury worldwide.



The Problem

The client faced significant production inefficiencies and downtime because their factory robots relied heavily on human operators and lacked autonomous capabilities. To enhance precision and safety, they sought a solution that addressed challenges like weak GPS signals and the absence of suitable indoor navigation technology, which limited the robots to predefined routes. Moreover, integration gaps in the systems impeded seamless monitoring of robots, raising safety concerns further.

The Approach

In response to the challenges faced by our client, we proposed an innovative solution leveraging indoor navigation. By meticulously mapping the environment and combining various technologies like visual markers, beacons, and VPS, we aimed to provide accurate and reliable navigation solutions tailored for indoor settings. Visual markers ensured high accuracy, beacons facilitated seamless positioning, while VPS utilized cameras for precise location determination, overcoming the limitations of GPS indoors.

Services



Integrated Electronics Platform



Motor Control Programming



Versatile Sensory Integration

The Process

We mapped the environment and created a detailed navigation graph to implement the solution. We integrated visual markers, beacons, and VPS into the system to ensure precise indoor localization.

Placing QR codes strategically throughout the factories enabled robots to scan and identify their positions, eliminating the reliance on unreliable GPS signals. Fine-tuned motor control algorithms were incorporated to ensure smooth and controlled movements, prioritizing operational efficiency and worker safety.

Additionally, sensor integration facilitated real-time obstacle detection and avoidance, while machine learning algorithms enhanced adaptability for dynamic scenarios.

The Result

As a result of our comprehensive solution, the client experienced significant improvements in localization precision, motion stability, and obstacle management.

With robots no longer reliant on predefined routes, they operated autonomously under supervision, facilitated by real-time feedback. Their factory environment became safer, more efficient, and adaptable to changing circumstances.



The Outcomes

30%

increase in overall localization precision, ensuring that the robots could accurately navigate within the factory environment.

40%

reduction in jerky or unstable motions, leading to improved operational efficiency and worker safety.

2X

decrease in disruptions caused by unforeseen obstacles, minimizing downtime and maximizing productivity.