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INNOVATION LAB: RTK 2025

YouWorkForce RTK

Precision geolocation (RTK) even in high-speed contexts

HIGH-PRECISION RTK GEOLOCATION

Safety and precision in autonomous driving

RTK offers **advanced satellite navigation technology**, designed to meet the needs of the most demanding customers, such as one of the leading testing centers in the automotive sector.

Thanks to its centimeter-level accuracy, RTK technology **is essential for high-speed applications**, ensuring extremely precise localization even in complex scenarios.

One of its key applications is the **"Collision Warning"** system, which calculates in real time the distance and speed of vehicles in the same lane, alerting the driver to a potential impact.

The accuracy of GPS coordinates provided by RTK technology is crucial for the proper functioning of this system, minimizing the margin of error and increasing safety while driving.

High speed is supported by RTK, which enables centimeter-level accuracy of GPS coordinates.

HOW IT WORKS

Usually, the GPS position detected by a commercial device has an error margin of a few meters, whereas with RTK positioning**, it is possible to achieve sub-decimeter accuracy (theoretically centimeter-level)**.

- In the circuit, there is a **Base Station** with known coordinates (calibrated with extreme precision) that can receive satellite signals and **transmit its GNSS differential corrections**.
- A smartphone app is installed to capture raw GNSS code measurements and, if the integrated hardware receiver in the phone allows, phase measurements (RAW data).
- Raw phone observables and reference station corrections are processed via an external server, reducing systemic errors from atmospheric signals and other factors. **This enables real-time smartphone positioning with sub-meter to sub-decimeter accuracy**.

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CASE STUDY

Our client

One of the most important and renowned testing centers in the world, a premium provider of a wide range of high-level testing and engineering services dedicated to the entire automotive industry.

Need

Monitoring vehicle traffic management within the Proving Ground areas and responding promptly to emergencies.

Traffic Management System adapted to the circuit's operational logic with:

- Live Data Map
- Alarm management for the control center and other users for traffic events via SoS and PTT
- Text message exchange (control center and users)
- Asset management and OBU delivery/collection flow
- Mobile Device Management
- RTK GPS leveraging the client's infrastructure to prevent potential accidents on secondary routes.

Solution

A web console that allows:

- Visualization of vehicles on the track, classified by type with different icons
- Sending alerts to drivers in case of critical situations
- Sending voice messages to vehicles on the track using a Push-To-Talk system

A pilot app that enables:

- Sending an alert or warning message in case of a critical condition
- Monitoring compliance with track rules (speed, number of vehicles present).

OTHER APPLICATION CONTEXTS

Precision Stamping

Our system allows for the **certification of the exact location and date of an event or detected anomaly with absolute precision**. Thanks to advanced geolocation and time synchronization technologies, each report can be associated with **precise coordinates and a reliable timestamp**.

This feature is particularly useful for field operators, such as law enforcement or maintenance agencies, who need to accurately document interventions, inspections, or anomalies through reports, photos, and georeferenced data.

Fault detection with precision sensors

One of the most innovative aspects of our product is its **ability to accurately detect and classify potential faults** in the field using advanced sensors. We are currently testing a system to precisely detect the location of potholes, facilitating targeted interventions.

This approach can be extended to various field operators, such as local police, who could report anomalies accompanied by photos and detailed reports, thus improving intervention efficiency and road safety.

Container Positioning in Large Areas

Our system allows for the **localization and positioning of containers within large open areas**, such as ports and logistics terminals, with centimeter-level precision.

Thanks to advanced geolocation technologies, it is possible to **optimize space management, reduce search times, and improve operational efficiency**, ensuring accurate control of movement and storage.

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