

infopulse

Part of TietoEVRY Group



Embedded Development for Automotive Computer Vision Solutions

Integrated Smart Camera and Augmented Guidance to Enable Assisted Driving

Client: Product Company

Industry: Automotive

Location: EU

Employees: 200+

CLIENT BACKGROUND

Headquartered in Germany, our customer, an automotive software company, focuses on AR and machine learning solutions for navigation and infotainment.

BUSINESS CHALLENGE

Our customer needed to **develop a software module for an integrated smart camera**. The customer wanted to introduce computer vision technology on a single physical camera of the vehicle. For the project, it was crucial to implement a software module that didn't require additional ECU and, as a result, wouldn't increase the costs of the system setup. The module had to be fully integrated with the existing IT infrastructure of the vehicle and other software modules. Combined with **computer vision**, the solution had to enable **sensor fusion and data fusion** to accurately recognize moving objects and gather data from different sources.

As the customer also intended to develop an augmented guidance solution with our help, the Infopulse team needed to integrate it with the designed software module. Augmented guidance had to provide advanced navigation and also comply with specific ADAS requirements. Finally, we were to develop complex control logic of AR-powered infotainment system.

SOLUTION

Infopulse developed **a software module (C/C++) of an integrated smart camera**, leveraging computer vision, machine learning, sensor fusion, and data fusion. A built-in environmental model allowed collecting data from different sources (navigation system, radar, sensors, etc.), thus increasing the quality of results. The software module enables access to both raw data and image stabilization parameters as well as confidence level estimation.

The camera itself **supports the following ADAS features:**

- Vehicle detection
- Different types of lanes detection
- Road model reconstruction
- Vanishing point and horizon level detection

Working on the augmented guidance solution, we successfully integrated it with the software module of a smart camera to improve both navigation and assisted driving.

The augmented guidance solution provides navigation hints projected to the windshield or HUD of the vehicle, including:

- Augmented lane change
- Maneuver assistance and route building hints
- Augmented POI and POI details
- Augmented street names
- Destination highlighting

Powered with computer vision and machine learning, the solution also supports such features as:

- Forward Collision warning
- Lane departure warning

TECHNOLOGIES

C/C++

BUSINESS VALUE

- Smart Camera functionality can be fully integrated with the augmented guidance, allowing to implement both automotive solutions within an advanced navigation system.
- Fusion of navigation, radar, V2V and V2I data allows for truly accurate assisted driving.
- Due to compatibility with any hardware and integration with the vehicle's existing ECU, implementation of software module decreases costs on the system setup.
- Augmented guidance can be utilized as an AR engine module or as a turn-key solution.
- Augmented hints can be projected to IVI, Instrument Cluster, or Head-Up Display.
- Flexible architecture allows running on customer-specific system configuration.
- Solves pitch/roll compensation problem.
- Applicable to any navigation engine.



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