ART-04-2016 - Safety and end-user acceptance aspects of road automation in the transition period

H2020-ART-2016-2017

Improved Trustworthiness and Weather-Independence of Conditionally Automated Vehicles in Mixed Traffic Scenarios

D4.1

Requirements and specifications for the adaptive HMI

This report is part of a project that has received funding from European Union's Horizon 2020 research and innovation programme under grant agreement No 723324.

Executive Summary

TrustVehicle project aims at developing trustable and robust controllers for automated driving along with adaptive Human-Machine Interfaces (HMI). One of the objectives of the TrustVehicle project is to develop and demonstrate an intuitive HMI for the safe management of the transition phases between automated driving and manual driving. Work Package 4 (WP4) is focusing on the HMI development for Level 3 Automated driving (L3AD).

The first task in WP4 has been the development of the general HMI concept and defining requirements for it. Today the HMI in the automotive industry is an important competitive factor and mostly OEM specific solution. Therefore, the generic HMI concept will be a modular high-level concept, which allows OEM-specific HMI designs and implementations later on in the project.

The project aims at the development of a human-centred L3AD system, based on identification of risky conditions by combining driver state estimators with a good knowledge of the environment around the vehicle. The general HMI concept is focusing on Ford Otosan and Linkker demonstration scenarios, both of which are targeting on low-speed automated driving scenarios in specific areas. The following features can be listed for the TrustVehicle general HMI concept:

- HMI supports safe transition between automated and manual driving modes during low-speed manoeuvring in mixed traffic situation
- Adaptive & intuitive HMI:
    - Measuring the driver state;
    - Identifying risky traffic conditions by combining driver state estimators with the information about the environment and other road users around the vehicle;
    - Prioritizing and adapting the information given to the driver.

This deliverable describes the HMI requirements and preliminary specifications including the architecture for the general HMI concept. The requirements for the general HMI concept have been collected and each HMI requirement has been analysed whether it is applicable for the following driving modes: Manual, Transition, and Automated driving. The work outlined in the deliverable will continue in WP4 towards the development of the HMI concept.

Key Words

Level 3 Automated Driving, HMI, Driver monitoring, Control authority transitions, Human-centred approach

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