Design a Hybrid Communication Protocols for Autonomous Driving

(Studien-, Diplom-, Projekt-, Bachelor- oder Master-Arbeit)

Prerequisites

Communication protocols
C / C++ programming
Linux OS

Supervisor

M.Sc. Shaban Guma
Gottlieb-Daimler-Str. 42
67663, Kaiserslautern
☎ +49 (0)631/205-4045
✉ +49 (0)631/205-4201
✉ shaban.guma@mv.uni-kl.de

Description

The targeted thesis topics consist of the design and implementation of a wireless communication interface/algorithm for time-critical applications in the automotive sector. Specifically, in the context of autonomous driving, a development of novel real-time, resource-aware, and cognitive hybrid time- and event-triggered protocols for bidirectional Car2Car, Car2X, and Car2Cloud communication. The proposed protocols should maintain the communication between the interconnected vehicles by utilizing the standard LTE and IEEE802.11p protocols and develop a set of APIs in the context of LTE and MK5 Software Development Kits (SDK).

Goals

- Development of the event- and time-triggered algorithms for Car2Car, Car2Cloud, and Car2X communication
- Cross-layer design of event-triggered TCP/IP and MQTT protocols for Car2Cloud communication
- Development of Car2Cloud data selectivity transmission algorithms for TCP/IP over LTE protocol
- Development of Car2X and Car2Car communication APIs based on IEEE802.11p standard by utilizing On Board Unit (OBU) and Road Side Units (RSU) hardware.
- Development of LTE resource allocation algorithm for Car2Cloud communication