Automatisierte Bildung von Rettungsgassen in komplexen Szenarien durch intelligente Vernetzung (AORTA)

Keywords
- Autonomous Connected Cars
- Emergency Lanes
- V2X Communication
- Digital Twin
- Cloud Services
- Mixed Traffic

Funding
- DLR Projektträger, BMVi

Time span
- Jan., 2021 – Dec., 2023

Collaborations
- 10 SME
- 2 Large Enterprises
- 2 Research Partners
- 1 Municipality

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Description
The aim of AORTA is to contribute to automated driving and connected vehicles by automatically creating an emergency lane to get first responder vehicles to their destination faster and safer, preventing traffic accidents with serious injuries and even fatalities and thus saving lives every day! This is achieved by closely integrating infrastructure, sensor technology, communication, HMI and vehicle technology, which enables coordinated decision-making levels of various degrees of abstraction from the rescue coordination center down to automated driving manoeuvres on a local level. Thereby a decentralized platform based on optimization and vehicle communication will be developed, which performs cooperative driving tasks to form an emergency lane by means of central and/or distributed decision making. The collected information will be processed locally using AI and control algorithms to calculate situation- and vehicle-specific maneuvers. Furthermore, the solution will be designed as a compatible extension to existing and future automation solutions of the vehicle manufacturers, based on current standards, so that no modification on the vehicle side is necessary to integrate involved vehicles.

Goals
- Micro management system with the objective of influencing the traffic in the immediate vicinity of the emergency vehicle in real time in such a way, that an emergency lane is formed autonomously by means of AI-based cooperative automated functions.
- Macro management system, whereby traffic interventions along the deployment route are planned and implemented via special communication interfaces to the road users located in the vicinity of the deployment site.
- Design and implementation of a holistic Digital Twin for road transport infrastructure and traffic.
- Autonomous driving utilizing hierarchical AI techniques and model-predictive control (MPC).

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