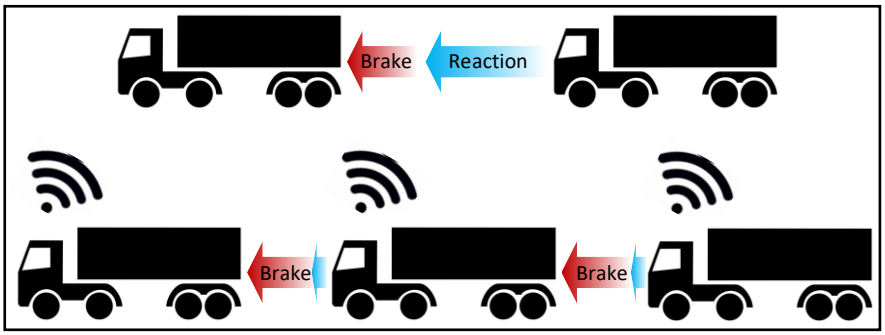
Platoon Control Policies based on Vehicle-To-Vehicle Communication in OMNET++

Motivation

Platooning, i.e., one vehicle closely following another vehicle, allows to form large convoys, where following vehicles are driven in an automated or semi-automated way. Platooning decreases fuel consumption and $C0_2$ emissions by benefiting from the aerodynamic drag reduction. To increase possible fuel savings, short inter vehicle distances are needed. To allow safe driving at short distances, Vehicle-To-Vehicle (V2V) communication is used: vehicles exchange information about their current position, velocity, and acceleration. Using the gathered data from one or more predecessors, a vehicle can determine whether it has to brake or to accelerate. Further, actions may be planned over certain time horizons, allowing other vehicles to plan and react accordingly.



Target Group

Students in ICE, Electrical Engineering, or comparable.

Thesis Type

Master Thesis
Master Project

Contact

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Goals and Tasks

- Literature research on the topic.
- Implementation of several control policies in C/C++.
- Testing in OMNET++, a simulation environment using V2V communication.
- Comparison and evaluation based on efficiency and computational effort.
- Summarize results in a written report.

Requirements

- Interest in automated driving applications
- Knowledge on control theory, wireless networks, and Linux systems
- Enhanced C/C++ programming skills