

Bachelor / Master's Thesis

Efficient Traffic Light Management for Platoons on Federal Highways

A vehicle platoon is formed by a number of vehicles following each other with a close distance at highway speed. This approach also tackles safety and traffic congestion problems by cooperatively coordinating vehicles in an autonomous way. The traffic flow is optimized by using an advanced Adaptive Cruise Control (ACC), called Co-operative ACC (CACC), which drastically reduces inter-vehicle gaps. Platooning involves control theory, dynamics of vehicles, different aspects of communication and traffic engineering.

Recent research in platooning is usually focused on freeway scenarios and algorithms to build and manage platoons. We believe that using such algorithms in other scenarios is usually a problem, as there are other conditions than on federal highways.



Our research is focused on federal highways. Federal highways have varying speed limits, single carriageway, intersections and traffic lights. If we assume a platoon has been established on a federal highway, we believe that it might be the case that it gets destroyed due to intersections, the limited opportunity for passing maneuver or due to traffic lights.

■ Goals of the thesis

In this thesis, the student will perform a study investigating different algorithms for traffic light control and implement them using OMNeT++, Veins and SUMO. The protocol(s) will be later checked for their possible use in a platoon scenario on federal highways. For this, different parameters to measure platoon properties will be used for the validation of the implemented approach.

■ Keywords

C++, Platooning, Network Simulation, Vehicular Networking

