



Master thesis No. 991

Design, Implementation and Evaluation of a Quality-of-Service Prediction for 5G Sidelinks in an Automotive Scenario



Methods

Simulation

Topics

Mobile Communication

Background

Vehicle-to-vehicle communication is an important use case of the 5G mobile communication infrastructure. This enables traffic participants to exchange their vehicle parameters like position, acceleration, and rotation and messages like warnings that are based on the traffic and the environment situation.

Since intact communication between traffic participants together with a cruise control in their vehicles can ensure that the vehicles brake or accelerate almost at the same time, vehicles can drive on tight in dense traffic for reasons of efficiency without increasing the risk of collision.

Assuming real mobile radio channels with fluctuating service quality, the drive-on distance must be, depending on a predicted quality of service, adequately adjusted to avoid both: collisions first, then traffic jams. The packet-delivery ratio is a possible indicator for a sufficient prediction of service quality.

Problem Description

In this thesis you will have to design, implement and evaluate a quality-of-service prediction for a 5G sidelink in an automotive scenario. This includes:

- Literature research
- Derivation of the best approach
- Design and implementation in SimLib
- Evaluation

Acquired Knowledge and Skills

You will gain insight into state-of-the-art 5G knowledge and its application for an automotive scenario. You will learn to derive a problem specific solution from existing literature. In addition, you will gain experience in using and extending a large discrete-event simulation software library.

Requirements

Programming Experience in Java
Kommunikationsnetze I

Contact

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