LTE D2D Technology for Platooning Applications

Master thesis project at RISE SICS Västerås.

Description
This thesis work is defined in the scope of the SafeCOP (Safe Cooperating Cyber-Physical Systems Using Wireless Communication) (www.safecop.eu) and ELECTRA projects. SafeCOP is a European project that targets cyber-physical systems-of-systems whose safe cooperation relies on wireless communication and the aim of ELECTRA is to investigate the challenges and communication needs of a safe, secure and efficient integration of the platoon into a broader C-ITS context. Platooning is both a challenging and rewarding application. Challenging since strict timing and reliability requirements are imposed by the distributed control system required to operate the platoon. Rewarding since considerable fuel reductions are possible. A platoon includes a leading vehicle which is operated by a professional driver, and one or more other vehicles, which are autonomously driven, following the leader in close proximity. Platooning is the first step toward fully autonomous driving, which is mentioned as one of the most important fifth-generation (5G) use cases. Spacing and speed in a platoon of vehicles are controlled by a fully automated control system that relies on updated vehicles’ kinematics data. The main goal of this thesis is to investigate the potential of long-term evolution (LTE) device-to-device (D2D) communications for data dissemination in the platoon. A few studies have been done in this area [1], but a deeper analysis is required to address D2D issues, such as handover management and reliability support that are exacerbated for platooning applications due to its unique features and strict demands.

This thesis is suitable for 1-2 students.

Qualifications: To be successful in this thesis work the candidate(s) would need the following

- Programming skills in C/C++.
- Other preferable programming languages Python or Java is a plus.
- Knowledge and experience on vehicular ad hoc network and cellular networks is a plus.
- Good spoken and written English skills are required.
- Knowledge of network simulators, such as NS-2, NS-3 and OMNeT++ is a plus.

References:

Contact Person
Ali Balador (ali.balador@ri.se), Senior Researcher at RISE SICS Västerås.

Application
To apply please send your CV along with the list of courses you have taken and their grades to ali.balador@ri.se. In your CV provide a short description of previous projects that you have done.

About RISE SICS Västerås
RISE SICS Västerås is a research institute with the aim to strengthen the innovation system in the Mälardalen region by offering applied research to both private and public organizations. Our projects typically involve a team of researchers and focus on delivering tangible results that create immediate and long-term value, based on the latest research results. We are constantly growing and are looking for researchers who enjoy the challenge of working in close collaboration with industry. SICS Västerås has a flexible organization that develops and applies methods and solutions in close collaboration with industrial, public and academic partners. Our core values are to be open-minded, value-driven, research-oriented, and to have fun! Read more about us at www.sics.se/groups/RISE-SICS-Vasteras.