Simulated Testbed for Platooning Application

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) project (www.safecop.eu). SafeCOP is a European project that targets cyber-physical systems-of-systems whose safe cooperation relies on wireless communication. Cooperative Cyber-Physical Systems require a tight coordination between different system components, including sensors, actuators, and controllers. A challenging example is platooning, where vehicles are driven as a group to reduce the air drag and therefore increase the fuel efficiency. The challenge arising is to share relevant data among vehicles without much delay, or to be more accurate, with predictable delay to provide for new services. Also, in case these services fail to deliver the data as required, safe actions should be taken. To evaluate the various application aspects (like safety risk and fuel savings) many parameters are to be considered (like velocity, braking capacity and weather conditions).

This thesis is suitable for 1-2 students. The thesis would involve the following steps (can be adjusted to research interest of the candidate(s)):

- Practice Veins vehicular network simulator, which is based on two well-established simulators: OMNeT++, an event-based network simulator, and SUMO, a road traffic simulator.
- Study available scenario that is already defined and implemented by RISE SICS Västerås.
- Model and implement an interaction protocol used for merging and splitting maneuvers of a platoon.

Qualifications
To be successful in this thesis work the candidate(s)would need the following:
- Excellent programming skills in C/C++
- Other preferable programming languages Python or Java
- Be fluent in English.

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

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RISE RESEARCH INSTITUTES OF SWEDEN
Division ICT
RISE SICS

ADRESS
Expectrum, Kopparbergsvägen 10
722 13 Västerås

KONTAKT
info.sics@ri.se, www.ri.se/sics