Module Title: Simulation of Vehicle-2-X Applications

Lecturer: Sangyoung Park, Technical University of Berlin

Module Description:

The aim of this module is to learn the basic theories regarding vehicle-to-x communications, identify and solve interesting control problems arising from this new technology. Rather than diving into deeper theories in the respective fields, this module aims at applying the theories to interesting real-world scenarios including vehicle platooning, traffic light control. This module comprises a tutorial part centered around Veins simulator based on OMNet++ (network simulator) and SUMO (microscopic traffic simulator), and will ask the students to select a topic of their own for applying the theories learnt from the lecture.

Lectures:

Lecture 1: Vehicular Communication Basics & Vehicle-2-Infrastructure Example

Lecture 2: Vehicular Communication Standards & Veins Simulator Architecture

Lecture 3: Longitudinal Control of Vehicles & Platooning example

Lecture 4: Fuel-Economy and EV Energy Consumption & Traffic light control

Each lecture will consist of 1.5 hours of lecture and 1.5 hours of tutorial.

Lecturer's bio: Sangyoung Park is an assistant professor of Mechanical Engineering and Transportation at Technical University of Berlin where he leads the research group Smart Mobility Systems. He is also affiliated with Einstein Center for Digital Future (ECDF). His research interests include energy-efficient and safe mobility systems utilizing vehicle-2-x communication. Also, he is interested in electrification of the transportation sector and works on battery management for electric vehicles, the charging infrastructure, and integration with renewable energy sources.

He got his PhD and BS degrees in Electrical Engineering and Computer Science from Seoul National University, Republic of Korea in 2008 and 2014, respectively. He was a visiting scholar at University of Southern California in 2010. Before joining TU Berlin and ECDF, he was a postdoctoral scholar at Chair of Real-Time Computer Systems, Technical University of Munich from 2014 to 2018.