PARC
Scheme for Promotion of Academic and Research Collaboration

Indian Institute of Technology Kharagpur
Kharagpur, INDIA

MICRO-CREDIT TITLE : INTRODUCTION TO VEHICLE-2-X: COMMUNICATION AND CONTROL

Lecturer : *Prof. Sangyoung Park, Technical University of Berlin*

The goal of this course (split across two micro-credits) is to provide an introduction to traffic models and V2X communication networks, and apply the knowledge to coordinated vehicle control applications using Veins simulator.

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. Students will first understand the vehicle dynamics modeling, microscopic car following models, control algorithms for vehicle fleets, and basics of the vehicular communication networks. Then, 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 etc.

Lectures: *(Each lecture will consist of 1.5 hours of lecturing followed by 1.5 hours of tutorial)*

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

All IIT students can register in this 1-0-0 micro-credit and appear for a quiz. The course can also be audited. You are advised to continue for the other related micro-credit by Prof. Park ("Simulation of Vehicle-2-X Applications") for a comprehensive V2X simulation tools experience.

Speaker's bio: 
Dr. 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 obtained 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.

Date, Time and Venue:

Date	Time	Venue
Aug 3, 2019 (Saturday)	0900 – 1200	CSE, Room No: 108
Aug 4, 2019 (Sunday)	0900 – 1200	CSE, Room No: 108
Aug 5, 2019 (Monday)	1800 – 2100	CSE, Room No: 108
Aug 6, 2019 (Tuesday)	1800 – 2100	CSE, Room No: 108