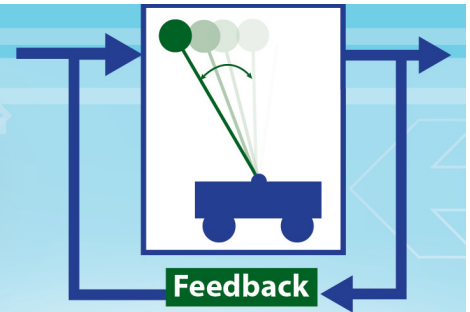


COLLEGE OF ENGINEERING

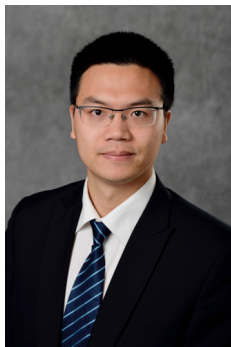
Control Seminar



Sponsored by: Bosch, Ford, and Toyota

Future Mobility: Cloud-Enabled Automotive Decision-Making Systems

Zhaojian Li



Michigan State University
Department of Mechanical Engineering

Friday, October 27, 2017

3:30 – 4:30 pm • 1500 EECS

ABSTRACT: Interest in employing cloud computing for automotive applications is growing to support computation and data intensive tasks. The cloud can provide access to “big data” as well as real-time crowd-sourced information. Smart utilization of on-demand cloud resources can increase situation awareness and provide additional functionalities.

In this talk, I will first present the Vehicle-to-Cloud-to-Vehicle framework and discuss its opportunities and challenges. The focus of the talk will be the exploitation of automotive vehicles to crowd-source road information. In this research, we developed an optimal state estimator for systems driven by jump-diffusion process. The developed estimator, together with an input observer, was used to estimate road profile and detect road anomalies such as potholes and speed bumps. I will also present an evolving clustering algorithm that is used to process the anomaly reports. Future work on Reinforcement Learning and Connected and Autonomous Vehicles will also be discussed.

BIO: I am an Assistant Professor in the Department of Mechanical Engineering at Michigan State University. My main research interests include Autonomous Vehicles, Intelligent Transportation System, Reinforcement Learning, Vehicle Dynamics, and Optimal Control. I obtained my M.S. (2013) and Ph.D. (2015) in Aerospace Engineering (flight dynamics and control) at the University of Michigan, Ann Arbor. As an undergraduate, I have studied at Nanjing University of Aeronautics and Astronautics, Department of Civil Aviation, in China. I defended my Ph.D. dissertation on the topic of Developments in Estimation and Control for Cloud-Enabled Automotive Vehicles. I was very fortunately advised by Prof. Ilya V. Kolmanovsky and Prof. Ella M. Atkins. From June 2010 to July 2012, I worked at Shanghai Area Control Center as an Air Traffic Controller. In the summers of 2014 and 2015, I was an intern at Ford Research and Advanced Engineering, Dearborn MI. From January 2016 to August 2017, I worked at General Motors in the NextGen Powertrain Control group, Milford MI.