

ROBOTICS ENGINEERING



RBE Colloquium Series Presents

Dr. Xiangrui Zeng

Data-Enhanced Automotive Powertrain Intelligent Control

Abstract: Automotive powertrain control has huge impact on vehicle energy efficiency and emission. Traditional powertrain controllers are calibrated in factories using standard driving cycle data, and remain unchanged thereafter. However, the same controller may not work well for different driving styles and driving conditions in the real world. This talk discusses designing data-enhanced hybrid electric vehicle powertrain controllers which learn from their user data and adjust their parameters to achieve better energy efficiency. The impact of driving style, uncertain driving conditions and uncertain route choice is considered together using historical driving data and geospatial data. Optimization is conducted off-line and the result is a real-time powertrain control strategy with optimized parameters. This proposed control method can learn the driver's driving habits and routes over time to improve the powertrain energy efficiency.

Bio: Xiangrui Zeng received his Ph.D. in Mechanical Engineering from The Ohio State University in 2016, his M.S. degree in Power Engineering and Engineering Thermophysics and his B.S. degree in Automotive Engineering from Tsinghua University in 2012 and 2006 respectively. He currently works at Ford Motor Company. Dr. Zeng's research includes automotive dynamic system and mobility cyber-physical system modeling, analysis, estimation, optimization and control.

Friday, February 8, 2019

2:00 p.m. - 3:00 p.m.

60 Gateway Park, GP 1002