SEMINAR

MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE AIDED TRAFFIC PREDICTION, CONTROL, AND MANAGEMENT

Speaker

Professor Lili DU

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Abstract

With the quickly growing volume and variety of transportation data, machine learning (ML) and artificial intelligence (AI) technologies present a great potential to arouse improved scientific understandings, transformative informed decisions, and innovative and proactive management solutions for future transportation systems. Meanwhile, transportation systems are complex and dynamic physical systems. They are often associated with very complicated and unique operation problems featuring nonconvexity, nonlinearity, high dimensionality, and prohibitive computational difficulties. The power of AI technology can only be fully unlocked when we well customize it with transportation domain knowledge. This presentation shares several of our research studies, which integrate ML/AI approaches with traffic flow analysis, optimization, game theories, and control technologies to address challenging issues in real-time traffic prediction, event detection, large-scale traffic management and control, involving emerging transportation technologies such as shared mobility and connected and autonomous vehicles.

Biography

Dr. Lili Du is an associate professor in the Civil and Coastal Engineering Department, University of Florida. Before that, she worked as an assistant and then an associate professor at the Illinois Institute of Technology (IIT) from 2012 to 2017, and as a Post-doctoral Research Associate for NEXTRANS at Purdue University from 2008 to 2012. Dr. Du received her Ph.D. degree in Decision Sciences and Engineering Systems with a minor in Operations Research and Statistics from Rensselaer Polytechnic Institute in 2008. Dr. Du's research is characterized by integrating operations research, network modeling, game theory, control theory, machine learning, and statistical methods into traffic flow analysis, transportation system analysis, and network modeling. Her current research mainly focuses on the impacts of connected and/or autonomous vehicles and electric vehicles, mobility on demand, smart curb, network resilience, and traffic flow analysis. Dr. Du's research has been published in Transportation Research Part B, Part C, and Part D, IEEE Transactions on ITS, Networks and Spatial Economics. Her research has been funded by National Science Foundation (NSF), State DOT, STRIDE UTC, and Toyota InfoTechnology Center. Dr. Du is a recipient of the NSF CAREER award in 2016. Her recent project, "Driverless City" won the First Nayar Prize at IIT. She is the founding chair of both TRB AEP40-4 subcommittee on Emerging Technologies in Network Modeling and ASCE-T&DI Artificial Intelligence in Transportation Committee. She serves as an editor for Transportation Research Part B: Methodological, an associate editor for IEEE Transactions on Intelligent Transportation Systems, and a member of the editorial advisory board for Transportation Research Part C: Emerging Technologies.

2 May 2023
Tuesday
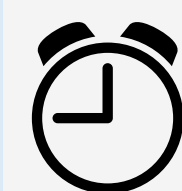
5:00pm to 6:00pm

Civil Engineering Conference Room Room 3574 (Lift 27/28) HKUST

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