

EPSTEIN INSTITUTE SEMINAR ▪ ISE 651

Stochastic and Distributionally Robust Optimization Approaches for Improving Shared-Mobility System Design and Operations

ABSTRACT - We consider several traditional Operations Research problems including facility location, vehicle routing, route planning, arising in emerging shared-mobility related applications including carsharing and ridesharing. This talk is based on a series of our work on using stochastic and distributionally robust optimization approaches for better designing and operating shared-mobility systems. We examine new facility-location models for systems that may involve competition, uncertain budget, or stochastic location-dependent demand. We also integrate facility location with vehicle routing to locate car rental facilities, parking spaces, and/or charging stations, for carsharing systems involving electric vehicles or deployed in underserved communities. For achieving efficient and high-quality ridesharing operations, we employ Approximate Dynamic Programming for on-demand ride-pooling, and use deep neural nets and imitation learning to learn user traveling preferences for real-time route planning in large-scale road networks. We demonstrate our results by testing both randomly generated and real-world road networks and data instances..



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SPEAKER BIO – Siqian Shen is an Associate Professor of Industrial and Operations Engineering at the University of Michigan and also serves as an Associate Director in the Michigan Institute for Computational Discovery & Engineering (MICDE). She obtained a B.S. degree from Tsinghua University in 2007 and Ph.D. from the University of Florida in 2011. Her theoretical research interests are in integer programming, stochastic/robust optimization, and network optimization. Applications include optimization and risk analysis of energy, healthcare, cloud computing, and transportation systems. She is a recipient of the IIE Pritsker Doctoral Dissertation Award (1st Place), IBM Smarter Planet Innovation Faculty Award, and Department of Energy (DoE) Early Career Award. Her research has been supported by the National Science Foundation, Army Research Office, Department of Energy, Department of Transportation, Ford Motor Company and DiDi ChuXing.

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3:30 PM – 4:50 PM

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