

Title: Optimization and Data Analytics Tools for Addressing COVID-19 Related Problems

Abstract: The outbreak of coronavirus disease 2019 (COVID-19) has created a global health crisis and the response to the COVID-19 pandemic is deeply influenced by local, national and global policies and decisions. In this talk, we present a few examples to demonstrate (i) how infection status dynamically affects mobility patterns and travel behavior, (ii) how to optimize business/state reopening and closedown strategies, and (iii) how to redesign public transit systems like city buses to reduce passengers' infection risk. In particular, we show the use of data analytics tools and optimization models for solving these problems, validated using real data of COVID-19 infection, business economy and local mobility. The talk is based on an ongoing collection of COVID-related system engineering problems and their solution methods at: <https://sites.google.com/umich.edu/decision-tools-for-covid19/>

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, IBM Smarter Planet Innovation Faculty Award, and Department of Energy (DoE) Early Career Award, and several best paper prizes from INFORMS. Her research has been supported by the National Science Foundation, Department of Defense, Department of Energy, Department of Transportation, and industry funds. She is in the editorial board of several journals including IIE Transactions, Networks, INFORMS Journal on Computing, Transportation Science, Manufacturing & Service Operations Management, and Service Science.