

# Providing Better Healthcare through Systems Engineering: Seminars and Discussions



**Siqian Shen, PhD**

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

**Monday September 19, 2022**

**4:30PM in IOE 1680**

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 strategize and dynamically perform lockdown and reopening, and (iii) how to redesign public transit systems 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/>

**Siqian Shen** is an Associate Professor and Richard Wilson Faculty Scholar in the Department of Industrial and Operations Engineering at the University of Michigan. She 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.

The seminar series “Providing Better Healthcare through Systems Engineering” is presented by the U-M Center for Healthcare Engineering and Patient Safety (CHEPS): Our mission is to improve the safety and quality of healthcare delivery through a multi-disciplinary, systems-engineering approach.

For the Zoom link and password, and to be added to the weekly e-mail for the series, please [RSVP here](#), or contact [genehkim@umich.edu](mailto:genehkim@umich.edu)