DESIGN AND OPERATIONS FOR RESILIENT INFRASTRUCTURE AND COMMUNITIES:
DO WE HAVE A SALINE SHORTAGE CRISIS IN THE US?

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MONDAY, MARCH 5
6:30 PM – 7:30 PM
Farzaneh Hall, Room 148

Resilient systems are equipped to respond effectively and recover quickly from disruptive events. A system can be broadly defined as a collection of interacting stakeholders, infrastructures, operations, and tasks that collectively form a complex whole. Examples of systems we work on include, supply chains, transportation, manufacturing, energy, and healthcare infrastructures. Resiliency in systems can be achieved by making effective decisions in designing for and preparing, responding, and recovering from natural or man-made disruptive events. Effective decision making in these stages require the consideration of multiple issues including:

- How to detect events that will eventually lead to a significant disruption;
- Analyzing the trade-off between vulnerability and risk reduction to costs involved;
- Understanding and managing the interaction and potentially conflicting objectives of multiple stake-holders;
- Allocation of limited resources under constrained settings.

As a case study, we discuss the growing epidemic of drug shortages in the US which points to the fragility of pharmaceutical supply chains in the face of disruptions.

Dr. Özlem Ergun's research focuses on design and management of large-scale and decentralized networks. She has applied her work on network design, management, and resilience to problems arising in many critical systems including transportation, pharmaceuticals, and healthcare. Recently, Dr. Ergun has been employing systems thinking and mathematical modeling in applications with societal impact. She has worked with organizations that respond to emergencies and humanitarian crisis around the world, including UN WFP, UNHCR, IFRC, OXFAM America, CARE USA, FEMA, USACE, CDC, AFCEMA, and MedShare International. She was the Coca-Cola Associate Professor in the School of Industrial and Systems Engineering at Georgia Institute of Technology until August 2014. She also co-founded and co-directed the Health and Humanitarian Systems Research Center at the Supply Chain and Logistics Institute. She received a B.S. in Operations Research and Industrial Engineering from Cornell University in 1996 and a Ph.D. in Operations Research from the Massachusetts Institute of Technology in 2001.

Analytics of Resilient Cyber-Physical-Social Networks

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