Presents:

**Dr. Jen Pazour**  
Associate Professor and Undergraduate Coordinator  
Dept. of Industrial & Systems Eng., Rensselaer Polytechnic Institute

“Optimization Models to Increase Supplier Autonomy and Resource Utilization”

**Abstract:** Underutilized resources exist all around us. When at a stoplight, notice the empty seats and cargo spaces in the vehicles around you. Think about the monolithic distribution centers that are a mismatch for most businesses’ seasonal and fluctuating space and throughput requirements. To harness these and other underutilized resources, organizations need to think differently about how resources are acquired, managed, and allocated to fulfill requests. Our team is creating new concepts and methods to harness underutilized resources for omni-channel fulfillment, distribution network designs, nonprofit resource sharing, crowdsourced delivery, ride sharing, and volunteer management. This talk will focus on one such solution: on-demand systems that match requests to independent, decentralized suppliers who are not employed nor controlled by the platform. In these situations, the platform cannot be certain a supplier will accept an offered request. To mitigate this selection uncertainty, a platform can offer each supplier a menu of requests to choose from. However, such menus need to be created carefully because of the trade-off between increasing selection probability and reduced systematic control. In addition to a complex decision space, supplier selection decisions are vast and have systematic implications, impacting the platform’s revenue, other suppliers’ experiences and the request waiting times. Thus, we present a multiple scenario approach, repeatedly sampling potential supplier selections, solving the corresponding two-stage decision problems, and combining the multiple different solutions through a consensus algorithm. Extensive computational results using ride sharing in the Chicago Region as a case study illustrate that our method outperforms a set of benchmark policies, and is tractable for real-time deployment. We quantify the value of anticipating supplier selection, offering menus to suppliers, offering requests to multiple suppliers at once, and holistically generating menus with the entire system in mind. Our method leads to more balanced assignments by sacrificing some easy wins towards better system performance over time and for all stakeholders involved, including increased revenue for the platform, and decreased match waiting times for suppliers and requests. This research is partially funded by the National Science Foundation award 1751801 and through a Johnson and Johnson WiSTEM2D fellowship. This is joint work with kind and talented people, including Rosemonde Ausseil, Hannah Horner, John Mitchell, Shahab Mofidi, and Marlin Ulmer.

**Biography:** Jen Pazour is an Associate Professor and the Undergraduate Coordinator of Industrial and Systems Engineering at Rensselaer Polytechnic Institute (RPI) in Troy, NY. Her research and teaching focus on the development and use of mathematical models to guide decision making for logistics and supply chain challenges. Jen is a recipient of a National Science Foundation Faculty Early Career Development (CAREER) Award (2018), a Johnson & Johnson Women in STEM2D Scholars Award (2018), a National Academies of Science Gulf Research Program Early-Career Fellowship (2016), and a Young Investigator Award from the Office of Naval Research (2013). She was awarded the 2019 Rensselaer Alumni Teaching Award, the 2018 ISE Logistics and Supply Chain Division Teaching Award, and the 2017 ISE Dr. Hamed K. Eldin Outstanding Early Career IE in Academia Award. She is an Associate Editor of *IISE Transactions* and *Military Operations Research*. She has served as a session organizer at the NAE Frontiers of Engineering Symposium, as the chair of the INFORMS professional recognition committee, chair of the INFORMS undergraduate operations research prize, the communications chair of the ISE Logistics and Supply Chain division and is on the ISE Transaction Social Media Team. She proudly holds three degrees in Industrial Engineering (a B.S. from South Dakota School of Mines and Technology, and a M.S. and Ph.D. from the University of Arkansas). More information can be found at her research and teaching blog: [http://jenpazour.wordpress.com/](http://jenpazour.wordpress.com/)

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