

# Seminar Announcement

Department of Management Science and Engineering

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**Prof. Max Z. Li,**

University of Michigan, Ann Arbor

## UNCERTAINTIES IN THE AIRSPACE: FROM DISTRIBUTIONALLY ROBUST AIR TRAFFIC FLOW MANAGEMENT TO STOCHASTIC ROUTING PROBLEMS FOR DRONE PACKAGE DELIVERY SYSTEMS

**Abstract:** The US National Airspace System (NAS) is becoming increasingly interconnected and data driven. The Information-Centric NAS vision laid out by the US Federal Aviation Administration encapsulates this, with focus on growing operations, infrastructure for traffic management, and safety assurance, all to increase predictability and resilience. However, given the myriad sources of dynamic uncertainty inherent within the NAS, predictions must incorporate not just this uncertainty, but the potential that the uncertainty itself is incorrectly modeled or characterized. To this end, I will discuss applications of distributionally robust optimization to a family of integer optimization problems for air traffic management decision-making (which flights to delay, and for how long). I will then move to discuss the impact of airspace and environmental uncertainties (e.g., stochastic winds) on new airspace entrants such as drones and other un-crewed aerial systems (UAS), and explore methods for characterizing and accounting for uncertainties.

**Short bio:** Max is an Assistant Professor of Aerospace Engineering at the University of Michigan, Ann Arbor. He also has courtesy appointments in Civil and Environmental Engineering as well as Industrial and Operations Engineering. Max received his PhD in Aerospace Engineering from the Massachusetts Institute of Technology in 2021. He earned his MSE in Systems Engineering and BSE in Electrical Engineering and Mathematics, both from the University of Pennsylvania, in 2018. Max's research and teaching interests include air transportation systems, airport and airline operations, Advanced Air Mobility, networked systems, as well as optimization and control.

**Date:** Feb 21, 2024, **Time:** 14:00-15:00, **Venue:** Faculty Hall (E7-7303, E7-7363)

**Hosted by:** Sirisha Rambhatla, Assistant Professor (MS&E)

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