Yuyang Ma

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Research Interest

Optimization under uncertainty, data-driven optimization, drone-based delivery system, healthcare operations research.

Education

Lehigh University Bethlehem, United States
Ph.D. Student in Industrial and Systems Engineering *August 2023 – May 2028 (Expected)*
Advisor: Dr. Karmel S. Shehadeh

Georgia Institute of Technology Atlanta, United States
Master of Science in Operations Research *August 2021 – December 2022*

University of Pittsburgh Pittsburgh, United States
Bachelor of Science in Industrial Engineering (Minor: Economics) *August 2020 – May 2021*

Sichuan University Chengdu, China
Bachelor of Engineering in Industrial Engineering *September 2017 – May 2020*

Research Experience

Drone-Supported Relief Facility Location and Item Distribution Optimization Lehigh University
Research Project Mentored by Dr. Karmel Shehadeh *January 2024 – Present*

- Proposed a two-stage robust optimization model for drone-based relief facility locations planning.
- Accounted for diverse relief items, varying drone capacities, and multiple facility types into the model.
- Incorporated facility disruption risks and demand uncertainty into the model, leveraging robust optimization techniques.
- Proposed a solution methodology using nested column-and-constraint generation algorithm to handle decision-dependent uncertainties and mixed integer recourse problem.

Using Deep Learning Method to Predict Engine Emission Georgia Tech
Research Project Mentored by Dr. Kamran Paynabar *January 2022 - Feburary 2023*

- Built a Multi-Step Ahead Engine Emission Prediction model based on the data of engine sensor recording.
- Developed linear time series prediction models such as ARIMA and ARIMA-X to examine if there is any linear relationship between the emission value and values from other sensors.
- Established new prediction models using recurrent neural network such as GRU, LSTM, and Transformer, which delivered 20% higher accuracy and lower variances compared with classical models.

Organ Transplant Prediction Georgia Tech
Course Project of Application of Operations Research *January 2022 - May 2022*

- Experimented machine learning methods to determine which patient on the waitlist will accept an organ.
- Processed over three million organ transplants records in the United States from the past 20 years, consisting of patient details, donor details, and quality of the organs.
- Applied a random forest model for prediction, which helps OPTN increase prediction accuracy by 10% compared with the accuracy of the model used by OPTN.

Teaching Experiences

Teaching Assistant

1. **Lehigh University**
   - ISE 230: Introduction to Stochastic Models in Operations Research *Fall 2024*
   - DSCI II 311: Optimization and Mathematical Foundations for Data Science *Summer 2024*
   - ISE 121: Applied Engineering Statistics *Spring 2024*
2. **Georgia Institute of Technology**
   - ISYE 8803: High Dimensional Data Analysis *Fall 2022*

Honors and Awards

Gibson/Gottshall Fellowship — Bethlehem, PA
Lehigh University — *Spring 2025*

Gottshall Fellowship — Bethlehem, PA
Lehigh University — *August 2023*

2018–2019 Comprehensive Second Prize — Chengdu, China
Sichuan University — *April 2019*

Dean's List — Chengdu, China
Sichuan University — *Feburary 2019*

Skills

Programming: Python (Pandas, PyTorch, NumPy, SciPy), R, SQL, Matlab, Bash
Optimization: Gurobi, AMPL, CPLEX
Others: Research, Communication, Teamwork, Leadership, Project Management
Languages: Mandarin (Native), English (Fluent)