

Yuyang Ma

Email: yuyangm@usc.edu
Phone: +1 (470) 457-9866
LinkedIn: linkedin.com/in/yuyangma1

EDUCATION

- **University of Southern California** Los Angeles, United States
Ph.D., Industrial and System Engineering August 2023 – Present
Advisor: Dr. Karmel S. Shehadeh
Courses: Interdisciplinary Approaches to Data-Driven Decision-Making, Linear Programming, Integer Programming
- **Georgia Institute of Technology** Atlanta, United States
M.S., Operations Research (GPA: 3.83/4.0) August 2021 – December 2022
Courses: High-Dimensional Data Analysis, Mathematical Foundation of Machine Learning, Deterministic Optimization, Simulation
- **University of Pittsburgh** Pittsburgh, United States
B.S., Industrial Engineering (GPA: 3.53/4.0) September 2017 – May 2021
Courses: Data Mining, Applied Econometrics, Supply Chain Analysis, Game Theory

PROFESSIONAL SUMMARY

- Ph.D. student in Industrial and Systems Engineering with expertise in developing large-scale optimization models and machine learning solutions for complex, uncertain environments.
- Experienced in **data-driven decision-making under uncertainty**, leveraging robust and stochastic optimization, mixed-integer programming, and learning-based approaches including neural networks and reinforcement learning.

RESEARCH EXPERIENCE

- **Drone-Supported Disaster-Relief Facility Optimization** Los Angeles, CA
Ph.D. Research under Dr. Karmel S. Shehadeh, University of Southern California Jun. 2024 - Oct. 2025
 - Architected a **two-stage robust optimization model** to determine facility locations and relief distribution, addressing critical uncertainties in post-disaster scenarios.
 - Modeled **decision-dependent uncertainty** to capture inter-facility correlation and operational coupling between drones and depots.
 - Designed a **column-and-constraint generation (C&CG)** algorithm, integrating custom heuristics to accelerate convergence; this novel approach reduced the robust optimization model's runtime by **80%** compared to the standard method, enabling near real-time decision support in crisis scenarios.
 - Achieved **21%** cost savings and **5×** improvement in demand fulfillment over conventional approaches.
- **Multi-Step Engine Emission Prediction** Atlanta, GA
Research Project under Dr. Kamran Paynabar, Georgia Institute of Technology Jun. 2022 - Feb. 2023
 - To provide early warnings for engine maintenance and ensure regulatory compliance, developed **deep learning models** (Transformer, GRU, LSTM) on **300K+** sensor readings in PyTorch for multi-step emission forecasting.
 - Achieved **20%** lower RMSE over ARIMA baselines with improved stability of emission predictions.

SELECTED PROJECTS

- **Organ Transplant Acceptance Prediction** Atlanta, GA
Course Project, Georgia Institute of Technology Jan. 2022 - May 2022
 - Analyzed over **3 million** U.S. organ transplant records to build a predictive model for organ acceptance, aiming to reduce organ discard rates.
 - Trained a **Random Forest** model in Scikit-learn that improved prediction accuracy by **10%**, directly contributing to more efficient organ allocation.
 - Visualized feature importance and acceptance probabilities to support OPTN model interpretability.

TECHNICAL SKILLS

- **Languages:** Python, R, MATLAB, Shell (Bash)
- **Frameworks & Tools:** PyTorch, TensorFlow, Gurobi, CPLEX, AMPL, OR-Tools, Tableau, SQL
- **Methodologies:** Robust Optimization, Stochastic Programming, Mixed-Integer Optimization, Heuristic Algorithms, Neural Networks, Reinforcement Learning, Experimental Design

HONORS & AWARDS

- **Gibson/Gottshall Fellowship** Lehigh University, United States
Lehigh University Aug 2023, Jan 2025