Hedieh Sazvar

Industrial Engineering and Management Science Department, Northwestern University
hedieh.sazvar@northwestern.edu | linkedin.com/in/hedieh-sazvar | Personal Webpage | +1 (720)-238-6533

Education

Northwestern University, Evanston, IL
Ph.D. Candidate in Operations Research (GPA: 3.77) Sep 2021 – Jun 2026 (Expected)
Advisors: Prof. Seyed M.R. Iravani, Prof. Sanjay Mehrotra
M.S. in Industrial Engineering (GPA: 3.7) Sep 2021 – Jun 2022

Sharif University of Technology, Tehran, Iran
B.S. in Industrial Engineering (GPA: 3.87) Sep 2016 – Feb 2021
Advisor: Prof. Mahmoud Houshmand
Thesis: Application of IoT and Cloud Computing in Agriculture

Skills

- **Programming:** Python, R, SQL
- **Mathematical Programming:** LP, NLP, IP; Stochastic Optimization (GurobiPy, AMPL)
- **Data Science:** ML, Time Series, Bayesian Models, Statistics, Causal Models, Big-data ETL
- **Experimentation & Metrics:** A/B testing, Metric Design, Robustness/Sensitivity Analysis
- **Stochastic Modeling & Simulation:** Stochastic Processes, Dynamic Programming, Monte Carlo
- **Reinforcement Learning:** MDPs; Multi-Armed Bandits; Policy Rollout & Lookahead
- **Research:** Problem Formulation, Decision-making Under Uncertainty, Problem Solving, Algorithm Design, Proactive Ownership, Strategic Planning, Technical Writing
- **Domain:** Online Platforms, Revenue Management & Assortment Optimization, Digital Advertising

Industry Experience

Moloco (Ads Data Science), Redwood City, CA
Data Science Intern Jun 2025 – Sep 2025
Evaluated Moloco Ads' core throttling mechanism that selectively filters bid requests from exchanges; designed a rigorous evaluation framework to measure its impact on advertiser campaign performance and recommend improvements.

- Analyzed millions of auction-level bid requests to uncover system-level performance patterns.
- Applied statistical methods to separate noise from signal.
- Provided recommendations projected to improve high-spending campaign performance by **more than 60%** in **return on ad spend (ROAS)**.
- Delivered reproducible analysis and documentation for future extensions.

Research Experience

Northwestern University, Evanston, IL
Research Assistant Jun 2022 – Present
NSF Funded Project: Nurse Matching to Hospitals Using Static and Dynamic Allocation through an Online Platform

- Designed optimization models for nurse-to-shift assignment with preferences, show-up probabilities, and varying shift vacancies; developed scalable heuristics and overbooking strategies to mitigate no-shows.
- Solved high-degree binary polynomial problems using exact and heuristic methods; implemented and evaluated formulations in Python/Gurobi.
- Developed assortment optimization models under dependent preferences, optimizing the offer set to each arriving agent under capacity and no-show uncertainty; implemented scalable reformulations in Python/Gurobi.

Independent Research
Rollout-Augmented Lookahead Policies for Dynamic Join Decisions in Fork-Join Queues

- Studied sequential join decisions in fork–join queues using a CTMC/MDP framework; developed a lookahead policy with rollout and benchmarked against heuristics and learning-based alternatives.
- Final research paper for IEMS-408, Decision Making in Dynamic Learning Environments Spring 2025

Co-authorship Network Analysis

- Analyzed collaboration patterns in revenue management using ERGMs and SAOMs to study static and dynamic network behavior.
- Final research paper for IEMS-441, Social Networks Fall 2024

Publications

- **H. Sazvar**, S. Iravani, S. Mehrotra. "Optimal Sequential Job Recommendations with No-Shows." In preparation for submission to *Manufacturing and Service Operations Management*.
- **H. Sazvar**, S. Iravani, S. Mehrotra. "Overbooking in Sequential Job Recommendations with No-Shows." In preparation for submission.
- **H. Sazvar**, S. Iravani, S. Mehrotra. "Optimization Models & their Reformulations in Job Recommender System with Dependent Preferences & No-Shows." In preparation for submission to INFORMS Journal on Computing.
- **H. Sazvar**. "Rollout-Augmented Lookahead Policies for Dynamic Join Decisions in Fork-Join Queues." In preparation for submission.

Teaching Experience

Northwestern University, Evanston, IL
Teaching Assistant (Selected) Sep 2022 – Present

- MLDS 490-23 Healthcare Analytics (M.S.): Delivered lectures on forecasting, optimization, scheduling, survival analysis, and R-based implementations.
- IEMS 303 Statistics (M.S.), IEMS 315 Stochastic Models (M.S.), IEMS 201 Intro to Statistics and Data-Driven Decision Making (M.S.), and others: graded, provided feedback, and held office hours.

PhD Coursework

- **Operations Research:** Linear Programming, Nonlinear Programming, Integer Programming, Convex Optimization, Distributed Optimization, Stochastic Optimization, Dynamic Programming, Logistics, Stochastic Processes, Stochastic Simulation
- **AI/ML, RL and Statistics:** Reinforcement Learning, Deep Learning, Applied Mathematical Statistics, Predictive Analytics

Honors and Awards

- Academic Excellence Award, Industrial Engineering Department, Sharif University of Technology 2016 – 2020
- Ranked 348th in Iran's National University Entrance Exam among 500,000+ participants 2016

Presentations

- INFORMS Annual Meeting 2024, Seattle, WA Oct 2024
- INFORMS Annual Meeting 2025, Atlanta, GA Oct 2025

Workshops

- Reinforcement Learning in Operations, Kellogg School of Management Aug 2022

Personal Interests

Piano, Taekwondo, Hiking, Biking, Running, Badminton, Fitness, Camping, Cooking, Watercolor Painting

References

Seyed M.R. Iravani s-iravani@northwestern.edu
Professor of Industrial Engineering and Management Sciences and (by courtesy) Operations Management
Northwestern University, Evanston, IL

Sanjay Mehrotra mehrotra@northwestern.edu
Professor of Industrial Engineering and Management Sciences
Northwestern University, Evanston, IL

Je-ok Choi je-ok.choi@moloco.com
Data Scientist, Moloco, Redwood City, CA