Haiqing Gao

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Technological Institute, 2145 Sheridan Road, L375, Evanston, IL, 60208

Research Interest

I'm interested in applying mathematical modeling and stochastic optimization to the design and control of non-profit operations. My current work focuses on uncovering structural properties of optimal allocation and routing policies, with the goal of enabling more effective machine learning approaches for online sequential allocations in non-profit contexts. Previously, I have conducted data-driven research in areas such as online matching platforms, preventive healthcare, and distributed learning. Broadly, my research aims to deepen the theoretical understanding of mathematical models to generate actionable managerial insights and support effective decision-making.

Education

Northwestern University
Ph.D. Candidate in Industrial Engineering and Management Science   Sep. 2022 – Current
Advised by Prof. Iravani M.R. Seyed and Prof. Sean R. Sinclair

The Chinese University of Hong Kong, Shenzhen
M. phil. in Computer Information and Engineering   Sep. 2020 – Jun. 2022
B.S. in Applied Mathematics (First Honor)   Sep. 2016 - May 2020

Publications

History-dependent or memoryless? Objective Selection for Fair Allocation and Routing in Nonprofits
Haiqing Gao, Seyed M.R. Iravani, Dawson J. Ren, Sean R. Sinclair
(Working Paper)
FedHD: Communication-efficient federated learning from hybrid data
Haiqing Gao, Songyang Ge, Tsung-hui Chang
Journal of the Franklin Institute (2023)

Presentations

History-dependent or memoryless? Objective Selection for Fair Allocation and Routing in Nonprofits
- INFORMS Annual Meeting, Public Sector OR   Oct. 2025
  Session Chair & Speaker
- 3rd Annual Supply Chain and Operations Management Conference (SCOM)   Aug. 2025
  Invited Talk for Dedicated Student Session

Fair Allocation in Nonprofit Operations: Optimal Routing Policy
- Chicago Area Society for Industrial and Applied Mathematics (SIAM) Student Conference 2025 (CASSC25)   Mar. 2025
  Poster & Lightning Talk
- Toyota Technological Institute at Chicago (TTIC) Workshop   Aug. 2024
  Poster & Lightning Talk

Federated Q-learning in Mobile Health (mHealth) Intervention
- Reinforcement Learning Projects Presentations for Graduate Students   Nov. 2020
  Poster & Lightning Talk

Fair Order Dispatch on the Online Ride-Hailing Platform
- Shenzhen Research Institute of Big Data (SRIBD) Research Presentation   Jul. 2019

Honors

The Chinese University of Hong Kong, Shenzhen
Dean's List (Top 10%)   2016-2019
Master's List (Top 10%)   2017-2019
Academic Performance Scholarship (Top 7%)   2017

Teaching Experience

Lecturer
Northwestern University
Lectures in Industrial Engineering and Management Science (IEMS) 302: Probability
Combinatorics and Conditional Probability   Jan. 19 2024
Continuous Distributions   Feb. 7 2024
The Chinese University of Hong Kong, Shenzhen
Online Teaching for High School Students in Oral English   Mar. 2020 - Apr. 2020

Teaching Assistant
Northwestern University
IEMS 365: Analytics for Social Good   Winter Quarter 2025
IEMS 303: Statistics   Fall Quarter 2024
IEMS 307: Quality Improvement by Experimental Design   Spring Quarter 2024
IEMS 302: Probability   Winter Quarter 2024
IEMS 201: Introduction to Statistics or Data-Driven Decision-Making   Fall Quarter 2023
The Chinese University of Hong Kong, Shenzhen
MATH 3253: Complex Variables   Spring Semester 2022
STA 2001: Probability and Statistics I   Spring Semester 2019

Service

INFORMS Student Chapter Event Organizer   Feb. 2024 – Mar. 2024
INFORMS Student Chapter at Northwestern University
-   Organized a game night within the department
-   Invited speakers and coordinated with SIAM student chapters for an inter-departmental seminar

Online Peer Mentor for the English Language Program Foundations   Jun. 2024 – Current
The Graduate School at Northwestern University
-   Held weekly meetings for 60 incoming international students on accommodating to the life in the USA
-   Served as mock students to interact with candidates in teaching demonstration assessments

INFORMS Peer Mentor   Dec. 2023 - Current
INFORMS Student Chapter at Northwestern University
-   Mentored two first-year IEMS Ph.D. students

TGS Diversity Peer Mentor   Dec. 2023 – Current
The Office of Diversity and Inclusion at Northwestern University
-   Mentored two first-year Northwestern international Ph.D. students

Skills

Programming Languages/Packages: Python, MATLAB, R, Java, LaTeX, TensorFlow, Keras
Languages: Chinese (Native), English (Fluent)