

Sadegh Shirani

sshirani@stanford.edu • www.SadeghShirani.com

APPOINTMENT

Assistant Professor **Operations Management**

MIT Sloan School of Management, Massachusetts, USA

July 2026

EDUCATION

PhD **Operations, Information and Technology**

Stanford Graduate School of Business, California, USA

2021-2026

M.Sc. **Management Sciences**

University of Waterloo, Ontario, Canada

2019-2021

M.Sc. **Probability and Finance**

Sorbonne University and École Polytechnique, Paris, France

2018-2019

B.Sc. **Mathematics**

Sharif University of Technology, Tehran, Iran

2014-2018

B.Sc. **Industrial Engineering**

Sharif University of Technology, Tehran, Iran

2012-2018

RESEARCH INTERESTS

LLM-based simulations: Building generative agent systems to model human and human-AI behavior at scale

Causal inference under limited observations: Experimentation when network connections or unit types are unknown

Sequential decision-making: Designing learning and control algorithms for dynamic stochastic environments

Applications: Digital platforms, social media influence, healthcare delivery

PUBLICATIONS AND WORKING PAPERS

Working Papers

Causal Effects with Unobserved Unit Types in Interacting Human-AI Systems [[link](#)]

with W. Overman, M. Bayati, *Working paper (available online)*, 2026.

Validating Causal Message Passing Against Network-Aware Methods on Real Experiments [[link](#)]

with A. Tan, J. Nordlund, M. Bayati, *Working paper (available online)*, 2026.

On Evolution-Based Models for Experimentation Under Interference [[link](#)]

with M. Bayati, *Working paper (available online)*, 2025.

Simulating and Experimenting with Social Media Mobilization Using LLM Agents [[link](#)][[code](#)]

with M. Bayati, *Working paper (available online)*, 2025.

Can We Validate Counterfactual Estimations in the Presence of General Network Interference? [[link](#)][[code](#)]

with Yuwei Luo, William Overman, Ruoxuan Xiong, M. Bayati, *Under review at Management Science*, 2025.

★ Second place, INFORMS Revenue Management and Pricing (RMP) Jeff McGill Student Paper Award, 2025

★ Honorable mention, INFORMS Health Applications Society (HAS) Best Student Paper Competition, 2025

★ Oral presentation at the Conference on Digital Experimentation @ MIT, 2025

★ Accepted for presentation at the MSOM Technology, Innovation, and Entrepreneurship SIG, 2025

Asymptotic Analysis of Multi-Class Advance Patient Scheduling [[link](#)]

with H. Abouee-Mehrzi and M. K. S. Faradonbeh, *Major Revision at Management Science*, 2025.

★ Second place, INFORMS Health Applications Society (HAS) Best Student Paper, 2023

★ MSOM Healthcare Operations Management SIG, 2023

★ Finalist, CORS Student Paper Award, 2022

Analysis of Thompson Sampling for Controlling Unknown Linear Diffusion Processes [[link](#)]

with M. K. S. Faradonbeh and M. Bayati, *Under review at Operations Research*, 2025.

★ Short version in Neural Information Processing Systems (NeurIPS), 2022

Journal Papers

Causal Message Passing for Experiments with Unknown and General Network Interference [\[link\]](#)[\[code\]](#)

with M. Bayati, *Proceedings of the National Academy of Sciences (PNAS)* 121(40), 2024.

- ★ Honorable mention, George Nicholson Student Paper Competition, 2024
- ★ Finalist, MSOM Student Paper Competition, 2024
- ★ Oral presentation at the Conference on Digital Experimentation @ MIT, 2024

Departure Time Choice Models in Urban Transportation Systems Based on Mean Field Games [\[link\]](#)

with M. Ameli, J. P. Lebacque, H. Abouee-Mehrizi, L. Leclercq, *Transportation Science* 56(6):1483-1504, 2022.

- ★ Best Paper, INFORMS TSL Urban Transportation SIG, 2022

Refereed Conference Papers

Higher-Order Causal Message Passing for Experimentation Under Unknown Interference [\[link\]](#)

with M. Bayati, Yuwei Luo, William Overman, Ruoxuan Xiong, *Neural Information Processing Systems (NeurIPS)*, 2024.

Online Reinforcement Learning in Stochastic Continuous-Time Systems [\[link\]](#)

with M. K. S. Faradonbeh, *Proceedings of Thirty Sixth Conference on Learning Theory (COLT)*, 2023.

Thompson sampling efficiently learns to control diffusion processes [\[link\]](#)

with M. K. S. Faradonbeh and M. Bayati, *Neural Information Processing Systems (NeurIPS)*, 2022.

Bayesian Algorithms Learn to Stabilize Unknown Continuous-Time Systems [\[link\]](#)

with M. K. S. Faradonbeh, *IFAC International Workshop on Adaptive and Learning Control Systems*, 2022.

Mean Field Games Framework to Departure Time Choice Equilibrium in Urban Traffic Networks [\[link\]](#)

with M. Ameli, J. P. Lebacque, H. Abouee-Mehrizi, L. Leclercq, *100th Transportation Research Board (TRB)*, 2021.

TEACHING ASSISTANTSHIP

Graduate School of Business, Stanford University

Business Intelligence from Big Data

Winter 2024, 2025

Department of Management Sciences, University of Waterloo

Financial Management for Engineers

Winter 2021, Spring 2021

Advanced Calculus and Numerical Methods

Fall 2020

Department of Mathematical Sciences, Sharif University of Technology

Stochastic Analysis

Spring 2016, 2017, 2018

Linear Algebra

Spring 2016, Fall 2016

Graduate School of Management and Economics, Sharif University of Technology

Financial Engineering

Fall 2017

Financial Economics

Fall 2016

AWARDS AND DISTINCTIONS

Gerald J. Lieberman Award, Stanford University	2025
Academic Career Advancement Fellowship, Stanford University	2025
Second place, INFORMS Revenue Management and Pricing (RMP) Jeff McGill Student Paper Award	2025
Honorable mention, INFORMS Health Applications Society (HAS) Best Student Paper	2025
Machine Learning in Economics Summer Institute Fellow, The University of Chicago	2024
Honorable mention, George Nicholson Student Paper Competition	2024
Finalist, MSOM Student Paper Competition	2024
Second place, INFORMS Health Applications Society (HAS) Best Student Paper	2023
The Institutional Venture Partners Fellowship, Stanford University	2022
Best Paper Award, INFORMS TSL Urban Transportation SIG	2022
Finalist, CORS Student Paper Award	2022
International Student Award, University of Waterloo	2019
Paris Graduate School for Mathematics Fellowship, Fondation Sciences Mathématiques de Paris	2018

SERVICE

Referee Operations Research, Mathematics of Operations Research, Biometrika, Health Care Management Science, Naval Research Logistics, World Congress of the International Federation of Automatic Control (IFAC), Transportation Research Record, Transportation Research Board Annual Meeting.

Organizer & Session chair Session on Stochastic Models for Experimentation, INFORMS APS 2025

Data Analyst Urmia Lake Restoration Program, Tehran, Iran 2017-2018

Chair Scientific Association of the Department of Industrial Engineering, SUT, Tehran, Iran 2017-2018

Executive Secretary Scientific Association of the Department of Industrial Engineering, SUT, Tehran, Iran 2015-2016

PRESENTATIONS

Conference on Digital Experimentation @ MIT, Boston, MA, USA	2025
Revenue Management and Pricing Conference, Columbia University, New York, NY, USA	2025
Applied Probability Society Conference, Georgia Institute of Technology, Atlanta, GA, USA	2025
ACM SIGMETRICS Causal Inference Workshop, Stony Brook University, Stony Brook, NY, USA	2025
Stanford Causal Science Center Conference on Experimentation, Stanford, CA, USA	2025
George Nicholson Student Paper Competition, Seattle, WA, USA	2024
MSOM Student Paper Competition, Seattle, WA, USA	2024
INFORMS Annual Meeting, Seattle, WA, USA	2024
Conference on Digital Experimentation @ MIT, Boston, MA, USA	2024
High-dimensional Data Workshop, Southern Methodist University, Dallas, TX, USA	2024
MSOM Conference, Twin Cities, MN, USA	2024
Stanford Causal Science Center Conference on Experimentation, Stanford, CA, USA	2024
Stanford Causal Science Center Conference, Stanford, CA, USA	2023
INFORMS Annual Meeting, Phoenix, AZ, USA	2023
INFORMS Healthcare Conference, Toronto, ON, Canada	2023
MSOM Healthcare Operations Management SIG Day, Montréal, QC, Canada	2023
Stanford Data Science Conference, Stanford, CA, USA	2023
INFORMS Annual Meeting, Indianapolis, IN, USA	2022
MSOM Conference, Munich, Germany	2022
CORS/INFORMS International Conference, Vancouver, Canada	2022
Tehran Institute for Advanced Studies, Tehran, Iran	2022
Stochastic Analysis and Applications Conference in Honor of Professor Bijan Zangeneh, Tehran, Iran	2021

COMPUTER SKILLS

Programming	General
◦ Python	◦ L ^A T _E X
◦ MATLAB	◦ Microsoft Office
◦ R programming	◦ Tableau
◦ C/C++	◦ Visual Paradigm