Siqiao Mu

U.S. Citizen
Evanston, IL
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Education

Northwestern University — Evanston, IL
Ph.D. in Engineering Sciences and Applied Mathematics — 2021–2026
Advisor: Diego Klabjan

California Institute of Technology — Pasadena, CA
B.S. in Applied and Computational Mathematics — 2016–2020

Research Interests

Machine learning, reinforcement learning, nonconvex optimization, stochastic optimization, gradient-based algorithms, AI safety, differential privacy, machine unlearning

Publications and Preprints

[1] S. Mu and D. Klabjan, "Certified machine unlearning via unconstrained stochastic gradient descent", *(in preparation)*, 2025.

[2] S. Mu and D. Klabjan, "On the second-order convergence of biased policy gradient algorithms", in *Forty-first International Conference on Machine Learning*, 2024.

[3] S. Mu and D. Klabjan, "Rewind-to-delete: Certified machine unlearning for nonconvex functions", 2024. arXiv: 2409.09778 [cs.LG].

[4] M. Ahlers, M. Bustamante, and S. Mu, "Unitarity bounds of astrophysical neutrinos", *Physical Review D*, vol. 98, no. 12, 2018.

Skills

Python (PyTorch, TensorFlow, Numpy, Pandas), MATLAB, C, C++, SQL, high-performance computing, bash, Kubernetes, JavaScript, R

Additional Experience

Los Alamos National Laboratory — Los Alamos, NM
Cybersecurity Summer School Research Intern — Summer 2024
Mentor: Juston Moore
Out-of-of distribution detection via neural tangent kernel methods

Nordstrom — Seattle, WA
Data Science Intern — Summer 2021
Combining prompt engineering with GPT-3 and UI/UX design to create a tool for generating clothing product descriptions

UCLA/Caltech — Pasadena, CA
Summer Undergraduate Research Fellowship — Summer 2020
Mentors: Franca Hoffmann, Mason Porter, Heather Zinn-Brooks

Utilizing mean-field approximations to model the effect of mixing patterns on disease spread

BlackRock New York, NY
Summer Analyst (Portfolio Analytics Group) Summer 2019

Niels Bohr Institute Copenhagen, DNK
Summer Undergraduate Research Fellowship Summer 2018
Mentors: Markus Ahlers and Mauricio Bustamante
Modeling astrophysical neutrino flavor oscillations based on new physics theories

NYU MRSEC New York, NY
Research Experience for Undergraduates Summer 2017
Mentor: David Grier

Teaching

- Advanced Algorithms for Machine Learning Fall 2024
  Developing slides and homework source code, office hours, grading, as the only TA for a class of ∼ 20 students
  Project topics: Policy Gradient, Deep Q-Networks, Federated Learning, Automated Feature Engineering
- Generating Business Value with Analytics Winter 2024
  Grading for a class of ∼ 20 students
- Multi-variable Calculus Spring 2023
  Leading lab sessions, office hours, grading, as one of 2 TAs for a class of ∼ 80 students
- Differential Equations Fall 2022
  Leading lab sessions, office hours, grading, as one of 4 TAs for a class of ∼ 100 students
- Introduction to Probability Models (Caltech) Fall 2019
  Office hours, grading, as one of 5 TAs for a class of ∼ 100 students

Leadership and Service

- The Thirty-Ninth Annual Conference on Neural Information Processing Systems 2025
  Reviewer
- Society for Industrial and Applied Mathematics (SIAM) Northwestern Student Chapter 2023–2025
  President
  Responsibilities: Organize meetings and events, coordinate payments, recruit members, recruit volunteers to help with events, interface with administration and other SIAM Chapters
  Some events:Chicago Area SIAM Student Conference (CASSC25), Argonne National Laboratory Field Trip, collaborative events with INFORMS, weekly SIAM Journal Club, Undergrad Boba Networking
- Northwestern M.S. in Machine Learning and Data Science Program Winter 2025
  Admissions application reader
- Northwestern Women in Mathematics (WIM) 2023–2025
  Member

Awards

- Northwestern Presidential Fellowship Nominee 2025
  Sole nominee from the ESAM department
- SIAM Student Chapter Certificate of Recognition 2024
  "Acknowledging Siqiao Mu for exceptional service to the Northwestern University Student Chapter during the 2023-2024 academic year"

- NSF Graduate Research Fellowship Program Honorable Mention 2023