Siqiao Mu

U.S. Citizen
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https://siqiaomu.github.io/

EDUCATION

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

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, low-rank training

PUBLICATIONS AND PREPRINTS

[1] S. Mu and D. Klabjan, "On the finite-time convergence rate of LoRA", *(in preparation)*, 2025.

[2] S. Mu and D. Klabjan, "Descend or rewind? stochastic gradient descent unlearning", 2025, [link]. arXiv: 2511.15983 [cs.LG].

[3] S. Mu and D. Klabjan, "Rewind-to-delete: Certified machine unlearning for nonconvex functions", *The Thirty-ninth Annual Conference on Neural Information Processing Systems*, 2025, [link], [ArXiv link].

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

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

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, Fall 2025
  Developing slides and homework source code, office hours, grading, as the only full TA for a class of ~25 graduate 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 graduate students
- Multi-variable Calculus — Spring 2023
  Leading lab sessions, office hours, grading, as one of 2 TAs for a class of ~80 undergraduate students
- Differential Equations — Fall 2022
  Leading lab sessions, office hours, grading, as one of 4 TAs for a class of ~100 undergraduate students
- Introduction to Probability Models (Caltech) — Fall 2019
  Office hours, grading, as one of 5 TAs for a class of ~100 undergraduate students

LEADERSHIP AND SERVICE

- Institute of Industrial and Systems Engineers (IISE) Annual Conference — 2026
  Modeling & Simulation Track Session Chair
- IEEE Transactions on Neural Networks and Learning Systems — 2025
  Reviewer
- 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 reviewer
- Northwestern Women in Mathematics (WIM) — 2023–2025
  Member

Other Conferences

- INFORMS Annual Meeting in Atlanta, Georgia 2025
  Invited talk: "Gradient-based methods for machine unlearning"
- SIAM Annual Meeting in Montreal, Canada 2025

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