

EDUCATION

<b>Northwestern University</b> Ph.D. in Engineering Sciences and Applied Mathematics <i>Advisor: Diego Klabjan</i>	Evanston, IL 2021–2026
<b>California Institute of Technology</b> B.S. in Applied and Computational Mathematics	Pasadena, CA 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, “Descend or rewind? stochastic gradient descent unlearning”, (*in preparation*), 2025.

[2] 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, [\[link\]](#).

[3] S. Mu and D. Klabjan, “On the second-order convergence of biased policy gradient algorithms”, *Forty-first International Conference on Machine Learning*, 2024, [\[link\]](#).

[4] 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

<b>Los Alamos National Laboratory</b> Cybersecurity Summer School Research Intern <i>Mentor: Juston Moore</i> <i>Out-of-of distribution detection via neural tangent kernel methods</i>	Los Alamos, NM Summer 2024
<b>Nordstrom</b> Data Science Intern <i>Combining prompt engineering with GPT-3 and UI/UX design to create a tool for generating clothing product descriptions</i>	Seattle, WA Summer 2021
<b>UCLA/Caltech</b> Summer Undergraduate Research Fellowship <i>Mentors: Franca Hoffmann, Mason Porter, Heather Zinn-Brooks</i>	Pasadena, CA Summer 2020

*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

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- Advanced Algorithms for Machine Learning Fall 2024  
*Developing slides and homework source code, office hours, grading, as the only TA for a class of  $\sim 20$  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  $\sim 20$  students*
- Multi-variable Calculus Spring 2023  
*Leading lab sessions, office hours, grading, as one of 2 TAs for a class of  $\sim 80$  students*
- Differential Equations Fall 2022  
*Leading lab sessions, office hours, grading, as one of 4 TAs for a class of  $\sim 100$  students*
- Introduction to Probability Models (Caltech) Fall 2019  
*Office hours, grading, as one of 5 TAs for a class of  $\sim 100$  students*

## LEADERSHIP AND SERVICE

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- 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*

## OTHER CONFERENCES

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

## AWARDS

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- Northwestern Presidential Fellowship Nominee 2025  
*Sole nominee from the ESAM department*
- SIAM Student Chapter Certificate of Recognition 2024  
*“Acknowledging Sigiao Mu for exceptional service to the Northwestern University Student Chapter during the 2023-2024 academic year”*
- NSF Graduate Research Fellowship Program Honorable Mention 2023