

## EDUCATION

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### Northwestern University

Ph.D. in Engineering Sciences and Applied Mathematics

Evanston, IL

2021–2026

*Advisor: Diego Klabjan, Industrial Engineering and Management Sciences*

### California Institute of Technology

B.S. in Applied and Computational Mathematics

Pasadena, CA

2016–2020

## RESEARCH INTERESTS

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

## PUBLICATIONS AND PREPRINTS

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- [1] S. Mu and D. Klabjan, “On the convergence rate of LoRA gradient descent”, 2025. arXiv: [2512.18248](https://arxiv.org/abs/2512.18248) [cs.LG].
- [2] S. Mu and D. Klabjan, “Descend or rewind? Stochastic gradient descent unlearning”, 2025. arXiv: [2511.15983](https://arxiv.org/abs/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, [\[link\]](#).
- [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

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

## ADDITIONAL EXPERIENCE

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### Los Alamos National Laboratory

Cybersecurity Summer School Research Intern

Los Alamos, NM

Summer 2024

*Mentor: Juston Moore*

*Out-of-distribution detection via neural tangent kernel methods*

### Nordstrom

Data Science Intern

Seattle, WA

Summer 2021

*Combining prompt engineering with GPT-3 and UI/UX design to create a tool for generating clothing product descriptions*

<b>UCLA/Caltech</b>	Pasadena, CA
Summer Undergraduate Research Fellowship	Summer 2020
<i>Mentors: Franca Hoffmann, Mason Porter, Heather Zinn-Brooks Utilizing mean-field approximations to model the effect of mixing patterns on disease spread</i>	
<b>BlackRock</b>	New York, NY
Summer Analyst (Portfolio Analytics Group)	Summer 2019
<b>Niels Bohr Institute</b>	
Summer Undergraduate Research Fellowship	Copenhagen, DNK
<i>Mentors: Markus Ahlers and Mauricio Bustamante Modeling astrophysical neutrino flavor oscillations based on new physics theories</i>	
<b>NYU MRSEC</b>	New York, NY
Research Experience for Undergraduates	Summer 2017
<i>Mentor: David Grier</i>	

## TEACHING

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- 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

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- 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

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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 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