

Simin Liu

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<https://sliu2019.github.io/>

<i>Interests</i>	My research topics are control and planning for robotics and machine learning.
<i>Education</i>	<p>Ph.D. in Robotics, Carnegie Mellon University 2019-2025 (expected) Advisors (2021 –present): John Dolan, Changliu Liu, safe and adaptive robotics Advisor (2019 –2020): David Woodruff, mathematics and machine learning Coursework: nonlinear and adaptive control, RL, modeling and estimation for robotics, ML, statistics, convex and nonlinear optimization</p> <p>B.S. with High Honors in EECS and Mathematics, University of California, Berkeley 2015-2019 Advisor: Sergey Levine, deep reinforcement learning for robotics Coursework: linear systems control (grad level), AI, mathematics for control and robotics (linear algebra, analysis, abstract algebra, probability)</p>
<i>Current projects</i>	(1) Real-time planning around dynamic obstacles and (2) neural network verification for networks in perception and control
<i>Publications</i>	<p>S. Liu, J. Dolan, and C. Liu, “Safe Control Under Input Limits with Neural Control Barrier Functions”, in 6th Annual Conference on Robot Learning, 2022.</p> <p>W. Zhao, T. He, T. Wei, S. Liu, and C. Liu, “Safety Index Synthesis via Sum-of-Squares Programming”, arXiv preprint arXiv:2209.09134, 2022. Under submission at 2023 American Controls Conference.</p> <p>Y. Li, H. Lin, S. Liu, A. Vakilian, and D. Woodruff, “Learning the Positions in CountSketch”. Under submission at 2023 International Conference on Learning Representations.</p> <p>S. Liu, T. Liu, A. Vakilian, Y. Wan, and D. Woodruff, “Learning the Positions in CountSketch”, arXiv preprint arXiv:2007.09890, 2020.</p> <p>A. Nagabandi*, I. Clavera*, S. Liu, R. S. Fearing, P. Abbeel, S. Levine, and C. Finn, “Learning to Adapt in Dynamic, Real-World Environments Through Meta-Reinforcement Learning”, in International Conference on Learning Representations, 2018.</p>
<i>Awards</i>	UC Berkeley undergraduate research honors 2019 Selected for Combinatorics, Algorithms, and AI for Real Problems program:

prestigious undergrad research program at University of Maryland 2018
Computing Research Association GHC research scholarship 2018
Microsoft GHC scholarship 2017
Top 10% of teaching assistants in UC Berkeley EECS 2017–2018
Inducted to Tau Beta Pi, Eta Kappa Nu, and Phi Beta Kappa:
national engineering, computer science, and liberal arts honor societies 2016
UC Berkeley College of Engineering Dean's List 2016–2019
William M. Olson/Warren E. Taylor Science and Engineering scholarship 2015
ACES-NM Young Asian-American Student Award 2015
Jane Street Unboxed scholarship 2015

Talks

“Safe Control Under Input Limits with Neural Control Barrier Functions”
October 2022, Safe Autonomous Systems Lab, UCSD
July 2022, PhD Speaking Qualifier, Robotics Institute, CMU

“Dealing with sample inefficiency in deep reinforcement learning for robotics”
July 2020, Session for Women in Machine Learning workshop at ICML

Teaching

Graduate Student Instructor, CMU

2021–2022

(1) modeling, estimation, and control for robotics, (2) mathematics for robotics

Undergraduate Student Instructor, UC Berkeley

2016–2019, top 10% instructor by student ratings

(1) intro to artificial intelligence, (2) algorithms in computer science, (3) intro to electrical engineering

Skills

Programming languages: Python (daily use), C++ (learned in courses)
Tools: PyTorch (proficient), TensorFlow (proficient), ROS (proficient)

Industry

Software Engineering Intern, Microsoft

Summer 2017

Worked on natural language processing at Cortana, applying ML tools like gradient boosting to classify the intent of Cortana queries.

Software Engineering Intern, Microsoft

Summer 2016

Prototyped a chatbot assistant for meeting scheduling. This successful demonstration preceded the serious adoption of chatbots in Teams, Microsoft's workplace messaging platform.