

SARA POHLAND

Electrical Engineering & Computer Science PhD Student

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EDUCATION

- Expected 2025 **University of California, Berkeley**
Ph.D. Electrical Engineering and Computer Science
Advisor: Prof. Claire Tomlin
- 2022 **University of California, Berkeley**
M.S. Electrical Engineering and Computer Science
Thesis: Socially Compliant Robot Navigation in Complex Indoor Environments
Advisor: Prof. Claire Tomlin
- 2020 **University of Maryland, College Park**
B.S. Electrical Engineering
Graduated Summa Cum Laude (GPA: 4.0/4.0)
Citations: Gemstone Honors Program & Engineering Honors Program

RESEARCH PROJECTS

- 2022-2023 **Uncertainty-Aware Complex Terrain Navigation**
Johns Hopkins University Applied Physics Lab
Developing a method for detecting and responding to domain shift to enable effective robot navigation in unknown environments with complex terrain.
- 2022-2023 **Rollover Detection & Prevention for Skid-Steer Vehicles**
Johns Hopkins University Applied Physics Lab
Designing a runtime monitor to prevent a skid-steer vehicle with uncertain dynamics from rolling over while traversing a steep slope.
- 2022-2023 **Socially Compliant Robot Navigation Under Uncertainty**
University of California, Berkeley
Enabled RL-based social robot navigation policies to generalize to arbitrary pedestrian behavior by incorporating pedestrian model deviation into the policy.
- 2021-2022 **Socially Compliant Robot Navigation in Complex Indoor Spaces**
University of California, Berkeley
Developed a modular framework utilizing a deep reinforcement learning policy that enables safe navigation around people and objects in complex indoor spaces.
- 2021-2022 **Learning a Group-Aware Policy for Robot Navigation**
Johns Hopkins University Applied Physics Lab
Contributed to work on social navigation algorithms for robots in crowds, focusing on socially compliant behavior around groups of people.
- 2019-2020 **Application of Control Theory Principles to Human Movement**
University of Maryland, College Park
Analyzed empirical data to recognize regularities in human movement and identify motion laws that reflect the movement of humans in cluttered spaces.

2019 **Safe Learning for High-Dimensional Robotic Systems**
University of California, Berkeley
Utilized reachability analysis and machine learning techniques to enable learning-based control schemes that guarantee safety in the physical world.

TEACHING EXPERIENCE

2023 Machine Learning Teaching Assistant
2022 Convex Optimization Teaching Assistant
2021-2022 AP Physics 1 Private Tutor
2021 Linear Systems Teaching Assistant
2020-2021 AP Calculus AB Private Tutor
2019-2020 Statistics Tutor for Math Success Program
2017-2020 Gemstone Honors Program Teaching Assistant

LEADERSHIP OPPORTUNITIES

2023 EECS Department Outreach and Student Visit Days Coordinator
2021-2023 Johns Hopkins Applied Physics Lab (APL) Technical Representative
2021-2022 Graduate Women of Engineering (GWE) Undergraduate Liaison
2019-2020 ECE Academic Affairs Committee Undergraduate Representative
2018-2020 ECE Peer Mentoring Leadership Team Member
2018-2020 A. James Clark School of Engineering Ambassador
2017-2020 Gemstone Honors Program Steering Committee Member

OUTREACH

2020-2023 Bay Area Scientists in Schools (BASIS) Robotics & Circuits Team Member
2014-2020 Sarah's House Homeless Shelter Childcare Provider and Tutor
2019 KIPP College Preparatory School K-12 Educational Support Volunteer

CONFERENCE PROCEEDINGS

2024 Avoiding Unfamiliar Pedestrians in RL-based Social Robot Navigation
[Submitted] IEEE International Conference on Robotics and Automation (ICRA)

2023 Runtime Monitor for Platform Protection Against Skid-Steer Untripped Rollovers
15th Annual Ground Vehicle Systems Engineering & Technology Symposium

2022 Learning a Group-Aware Policy for Robot Navigation
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2020 Investigating a Cooperative System of Sensing and Transmitting Haptic Feedback of Soft Tissue for Robotic Surgical Applications
Gemstone Senior Thesis Conference

2020 Haptic Feedback of Soft Tissue for Robotic Surgical Applications
National Collegiate Research Conference (NCRC)

2019 Efficient Safe Learning for Robotic Systems in Unstructured Environments
IEEE International Conference on Mobile Ad Hoc and Sensor Systems

2019 Efficient Safe Learning for Robotic Systems in Unstructured Environments
IEEE MIT Undergraduate Research Technology Conference (URTC)

HONORS & AWARDS

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| 2020 | National Science Foundation Graduate Research Fellowship |
| 2020 | Chancellor's Fellowship for Graduate Study |
| 2020 | Berkeley EECS Excellence Award |
| 2020 | Maryland Medallion Society |
| 2020 | ECE Department Chair's Award |
| 2020 | ECE Department Service Award |
| 2019 | Spirit of Maryland Finalist |
| 2019 | Dinah Berman Memorial Award |
| 2019 | ECE Outstanding Academic Performance Award |