

# SARA POHLAND

Electrical Engineering & Computer Science PhD Student

<http://people.eecs.berkeley.edu/~spohland/>

## EDUCATION

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- 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

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- 2022 **Uncertainty-Aware Complex Terrain Navigation**  
Developed a method for out-of-distribution detection and a control framework for navigation in unknown environments with complex terrain.
- 2022 **Rollover Detection & Prevention for Skid-Steer Vehicles**  
Designed an optimal control framework to prevent a skid-steer vehicle from rolling over while traversing a steep slope.
- 2021-2022 **Socially Compliant Robot Navigation in Complex Indoor Spaces**  
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**  
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**  
Analyzed empirical data to recognize regularities in human movement and identify motion laws that reflect the movement of humans in cluttered spaces.
- 2017-2020 **Tactile Feedback for Robotic Assisted Surgery**  
Developed a tactile feedback system for robotic surgery that relies on force sensors and a magnetic actuator to relay tissue firmness to a robotic surgeon.
- 2019 **Safe Learning for High-Dimensional Robotic Systems**  
Utilized reachability analysis and machine learning techniques to enable learning-based control schemes that guarantee safety in the physical world.

## TEACHING EXPERIENCE

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- 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 Math Success Program Tutor  
2017-2020 Gemstone Honors Program Teaching Assistant

## LEADERSHIP OPPORTUNITIES

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2021-2022 Johns Hopkins Applied Physics Lab (APL) Intern Ambassador  
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

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2020-2022 Bay Area Scientists in Schools (BASIS) Robotics 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

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2022 Learning a Group-Aware Policy for Robot Navigation  
K. Katyal, Y. Gao, J. Markowitz, S. Pohland, C. Rivera, I. Wang, C. Huang  
*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  
S. Darwin, et al.  
*Gemstone Senior Thesis Conference*

2020 Haptic Feedback of Soft Tissue for Robotic Surgical Applications  
S. Pohland, et al.  
*National Collegiate Research Conference (NCRC)*

2019 Efficient Safe Learning for Robotic Systems in Unstructured Environments  
S. Pohland, S. Herbert, & C. Tomlin  
*IEEE International Conference on Mobile Ad Hoc and Sensor Systems*

2019 Efficient Safe Learning for Robotic Systems in Unstructured Environments  
S. Pohland, S. Herbert, & C. Tomlin  
*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