

Sean J. Wang

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RESEARCH INTERESTS	My research focuses on making robots more capable in real world environments. I am particularly interested in making reinforcement learning algorithms suitable for physical systems by improving robustness, adaptability and sample efficiency.	
EDUCATION	Carnegie Mellon University	Anticipated Graduation: Dec. 2022
	PhD, Mechanical Engineering GPA: 4.0	
	University of California, Santa Barbara	June 2018
	BS/MS, Mechanical Engineering BS Major GPA: 3.97 MS GPA: 4.0	
PHD RESEARCH	Learning to Drive Off-Road	Jan. 2020 - Present
	<ul style="list-style-type: none">- Developed sample efficient reinforcement learning algorithms to create robust and adaptable policies to drive robots over rough terrain with unavoidable obstacles.- Implemented algorithms using PyTorch and evaluated performance on real world and PyBullet simulated robots.	
	Robotic Environmental Sampling	May 2019 - Present
	<ul style="list-style-type: none">- Designed and built a robot to collect soil samples from remote locations.- Integrating sensors and controls for in situ measurement of soil contaminants.- Developing algorithms that plan sampling locations for optimal information gain.	
	Contact Localization for Transparent Robots	May 2018 - May 2019
ACADEMIC & RESEARCH PROJECTS	<ul style="list-style-type: none">- Created a velocity-based method for transparent robots to localize contact.- Implemented method on a legged Minitaur robot and in simulation.	
	ISLA - CMU	Jan. 2019 - May 2019
	<ul style="list-style-type: none">- Designed a bio-inspired quadrupedal robot that rolls for more efficient locomotion.- Simulated and optimized rolling behavior.	
	Advanced Imaging Drone - UCSB	August 2016 - May 2017
	<ul style="list-style-type: none">- Developed pilot awareness and safety systems that allow unmanned aerial systems to fly through forest canopies and locate endangered birds.	
	Multi-Agent Surveillance Path Planning - UCSB	Jan. 2016 - June 2016
	<ul style="list-style-type: none">- Created coverage control algorithms for networks of surveillance robots operating under sparse communication constraints.- Implemented a Monte Carlo simulation of algorithm to evaluate performance.	
	Remote Bike Lock Design - UCSB	Mar. 2016 - June 2016
	<ul style="list-style-type: none">- Created a prototype remote controlled bike lock with locating features.	
	RoboRat Design - UCSB	Mar. 2015 - June 2015
	<ul style="list-style-type: none">- Built a robot capable of autonomously navigating a course to collect blocks.	

INDUSTRY EXPERIENCE	Strand Products, Inc. Santa Barbara, CA <i>Mechanical Engineer Intern</i> - Designed machines to automate manufacturing processes of cable assemblies.	May 2017 - Aug. 2017
	Continental AG. Santa Barbara, CA <i>Mechanical Engineer Intern</i> - Designed components for a long range LIDAR sensor prototype.	May 2016 - Dec. 2016
TEACHING EXPERIENCE	Carnegie Mellon University 24-352 (<i>Dynamics, Systems & Controls</i>) TA	Jan. 2020 - Dec. 2020
	University of California, Santa Barbara ME 10 (<i>Graphic, CAD & Design</i>) TA	Mar. 2018 - June 2018
	ME 156A/B (<i>Mech. Eng. Design I/II</i>) TA	Sep. 2017 - Mar. 2018
	ME 155A (<i>Control System Design</i>) Reader	Mar. 2017 - June 2017
	ME 179P/L (<i>Robotics: Planning/Design</i>) Reader	Mar. 2016 - June 2016
PUBLICATIONS	<ol style="list-style-type: none"> 1. Sean J. Wang, Samuel Triest, Wenshan Wang, Sebastian Scherer, and Aaron M. Johnson. Rough terrain navigation using divergence constrained model-based reinforcement learning. In <i>Conference on Robot Learning</i>. PMLR, 2021. To appear 2. Sean J. Wang and Aaron M Johnson. Domain adaptation using system invariant dynamics models. In <i>Learning for Dynamics and Control</i>, pages 1130–1141. PMLR, 2021 3. Sean Wang, Valeria Nava, Nicholas Jones, Gregory Lowry, and Aaron M. Johnson. Ground-based robots for soil collection and analysis. In <i>American Geophysical Union (AGU) Fall Meeting</i>, December 2020 4. Sean J. Wang, Ankit Bhatia, Matthew T. Mason, and Aaron M. Johnson. Contact localization using velocity constraints. In <i>Proceedings of the IEEE/RSJ Intl. Conference on Intelligent Robots and Systems</i>, Las Vegas, NV, Oct. 2020 5. Letong Wang, Sean Wang, and Aaron M. Johnson. Traversability analysis for highly maneuverable wheeled robots. Technical report, CMU Robotics Institute Summer Scholars Working Papers Journal, 2019 6. Jeffrey R. Peters, Sean J. Wang, and Francesco Bullo. Coverage control with anytime updates for persistent surveillance missions. In <i>2017 American Control Conference (ACC)</i>, pages 265–270. IEEE, 2017 7. Jeffrey R. Peters, Sean J. Wang, Amit Surana, and Francesco Bullo. Cloud-supported coverage control for persistent surveillance missions. <i>Journal of Dynamic Systems, Measurement, and Control</i>, 139(8), 2017 	
SKILLS	Software & Programming: C++, Python, PyTorch, PyBullet, ROS, MATLAB Algorithms: Deep Reinforcement Learning, Path Planning, State Estimation/Filtering Prototyping: CAD (SolidWorks & CATIA), Basic Fabrication, Basic Circuitry	
HONORS & AWARDS	TCS Presidential Fellowship	Aug. 2018 - July 2019
	Tirrell Award for Distinction in Undergraduate Research	May 2017
	UCSB Junior Design Fair - Most Marketable Product	May 2016
	1st Place, UCSB Robotics: Design RoboRat Competition	May 2015