Victoria Mason Edwards torriemed@gmail.com
Graduate Student Research Assistant, Ph.D Candidate
University of Pennsylvania
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EDUCATION

- **Ph.D Student** September 2020 - Present
  University of Pennsylvania, Mechanical Engineering and Applied Mechanics
  Advised by Professor M. Ani Hsieh

- **Masters of Science in Robotics** December 2017
  University of Michigan, Rackham Graduate School, Robotics Institute
  Advised by Professor Edwin Olson

- **Bachelor of Arts in Computer Science and Mathematics** May 2016
  Colby College
  Thesis: *Follow Me Robot*
  Advised by Professor Bruce Maxwell

PROFESSIONAL EXPERIENCE

- **University of Pennsylvania** September 2020 - Present
  Graduate Student Research Assistant
- **Naval Research Laboratory** July 2018 - August 2020
  Autonomous Systems Scientist
- **University of Michigan** August 2016 - May 2018
  Graduate Student Research Assistant
- **The Federal University of Minas Gerais** June 2015 - August 2015
  Research Assistant
- **Colby College** September 2014 - May 2016
  Teaching Assistant & Project Grader
- **Drexel University** June 2014 - August 2014
  Research Assistant

HONORS AND AWARDS

[1] John A. Goff Prize for outstanding scholarship, resourcefulness, and leadership 2025

[2] Outstanding GRASP Service Award 2025

[3] RSS Pioneer Scholar 2025

[4] Outstanding Teaching Award, University of Pennsylvania School of Engineering 2023, 2024

[5] Outstanding MEAM Teaching Assistant Award Spring 2022

[6] National Defense Science and Engineering Graduate Fellowship September 2021 - September 2024

[7] Karles Fellow at the US Naval Research Laboratory July 2018 - July 2020

TEACHING

[1] Center for Excellence in Teaching, Learning and Innovation (CETLI) Teaching Certificate, University of Pennsylvania, 2023

[2] Head TA for MEAM 520, Introduction to Robotics, University of Pennsylvania, Fall ‘21, Spring ‘22

[3] Head TA for MEAM 5100, Design of Mechatronic Systems, University of Pennsylvania, Fall ‘22

[4] General Computer Lab TA, Colby College (Covering 100, 200, and 300 level CS course material), Fall ‘14, Spring ‘15, Fall ‘15, Spring ‘16

PEER REVIEWED PUBLICATIONS

Journals

[1] Kumar A, Silva T. C., Edwards V, and Hsieh M. A, “Flow-Based Localization and Mapping for Multi-Robot Systems,” to appear in *IEEE Robotics and Automation Letters* 2025

[2] Salam T, Edwards V, and Hsieh M. A, “Learning and Leveraging Features in Flow-Like Environments to Improve Situational Awareness,” in *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 2071-2078, April 2022

[3] Hindes, J, Edwards, V, Hsieh, M. A, & Schwartz, I B, “Critical transition for colliding Swarms,” *Physical Review E*, *103*(6), 062602, 2021.

[4] Edwards V, deZonia P, Hsieh M. A, Hindes J, Triandaf I, Schwartz I B. “Delay Induced Swarm Pattern Bifurcations in Mixed Reality Experiments,” *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 30, no. 7, p. 073126, 2020.

[5] Hindes J, Edwards V, Kamimoto S, Triandaf I, Schwartz I B, “Unstable modes and bistability in delay-coupled swarms,” Physical Review E, vol. 101, no 4. P. 042202, 2020.

[6] Hindes J, Edwards V, Kamimoto S, Stantchev G, Schwartz I B, “Stability of milling patterns in self-propelled swarms on surfaces,” *Physical Review E, vol. 102, no 2.* P. 022212, 2020.

[7] Schwartz I B, Edwards V, Kamimoto S, Kasraie K, Hsieh M A, Triandaf I, Hindes J, “Tours bifurcations of large-scale swarms having range dependent communication delay,” *Chaos: An Interdisciplinary Journal of Nonlinear Science*, vol. 30, no. 5, p. 051106, 2020.

Conferences

[1] Edwards V, Hsieh M. A, “Distributed Adaptive Macroscopic Ensemble Task Allocation of Heterogeneous Robot Teams in Dynamic Environments,” Extended Abstract, to Appear In Proceedings of the 24th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS ‘25).

[2] Edwards V, Silva T C., Hsieh M. A, “A Macroscopic Ensemble Modeling Approach to Collaborative Task Assignment in Dynamic Environments,” In Distributed Autonomous Robotic Systems (DARS), Oct 2024

[3] Edwards V, Silva T C., Mehta B, Dhanoa J, Hsieh M. A, “On Collaborative Robot Teams for Environmental Monitoring: A Macroscopic Ensemble Approach,” In the International Conference on Intelligent Robotic Systems (IROS), Oct 2023

[4] Edwards V, Silva T C., Hsieh M. A, “Stochastic Nonlinear Ensemble Modeling and Control for Robot Team Environmental Monitoring,” In Distributed Autonomous Robotic Systems (DARS), Nov 2022

[5] Silva T C. Silva, Edwards V, Hsieh M. A, “Proportional Control for Stochastic Regulation on Allocation of Multi-Robots,” In Distributed Autonomous Robotic Systems (DARS), Nov 2022

[6] Li, A K, Mao, Y, Manjanna, S, Liu, S, Dhanoa, J, Mehta, B, Edwards, V, Cladera, F, Hsieh, M. A, Le Men, M, Sigg E, Jerolmack D J, and Ulloa H N, 2022, October. “Towards understanding underwater weather events in rivers using autonomous surface vehicles.” In *IEEE OCEANS 2022,* Hampton Roads, Oct 2022.

[7] Edwards V, Gaskell P, and Olson E, 2018. “Calibrating Mixed Reality for Scalable Multi-Robot Experiments,” Extended Abstract, In Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems (AAMAS '18).

[8] Edwards V, Rezeck P, Chaimowicz L, Hsieh M. A., “Segregation of Heterogeneous Robotics Swarms via Convex Optimization,” ASME. *Dynamic Systems and Control Conference.* 2016.

Workshops

[1] Edwards V, “Design, Collaborate, and Adapt: Multi Robot Systems for Monitoring Dynamic Environments,” RSS Pioneers Workshop, Robotics: Science and Systems (RSS), 2025.

[2] Edwards V. and Hsieh, M. A, “Resilient Multi Robot Task Selection for Monitoring Spatiotemporal Environments”, Workshop on Scalable and Resilient Multi Robot Systems, Robotics: Science and Systems (RSS), 2025.

[3] Edwards V, Li A. K, Cladera F, Kumar A, Xuan D, Silva T C., Ulloa H N., Jerolmack D J., Hsieh M. A, “Monitoring Urban Aquatic Environments with Autonomous Surface Vehicles,” REaCT: Robotics for Environmental and Climate Assessment Workshop, International Conference on Robotics and Automation (ICRA). 2025.

[4] Edwards V, McGuire L, Redfield S, “Establishing Reliable Robot Behavior using Capability Analysis Tables”, First workshop on Agents and Robots for Reliable Engineered Autonomy (AREA), European Conference on Artificial Intelligence (ECAI), 2020.

[5] Wright B, Edwards V, “Crowd Polarization as Environmental Alignment Heuristic,” Crowdbot Workshop: Robots from Pathways to Crowds, ethical, legal, and safety concerns of robots navigating in human environments, IEEE International conference on Robot & Human Interactive Communication (ROMAN), 2020.

NON-PEER REVIEWED

Presentations

[1] Edwards V, “Macroscopic Ensemble Methods for Multi Robot Data Collection in Dynamic Environments”, Mechanical Engineering And Applied Mechanics Departmental Seminar, University of Pennsylvania, July 2024

[2] Edwards V, “Macroscopic Ensemble Methods for Multi Robot Task Assignment in Dynamic Environments”, Kod Lab Research Group, University of Pennsylvania, June 2024

[3] Edwards V, “Robot Teams for Environmental Monitoring: a Top Down approach”, Nagpal Research Group, Princeton University, June 2023

[4] Edwards V, “Mixed Reality for Scaled Swarming Experiments”, Dynamic Days Conference, Society for Industrial and Applied Mathematics (SIAM), May 2021

[5] Edwards V, “Evaluating Robustness of Pattern Formation using Mixed Reality”, Unmanned Maritime Systems Technology ONR Program Review, Sandestin Beach, FL, January 2020

[6] Edwards V, “Mixed Reality Experimental Pattern Formation,” Science of Autonomy ONR Program Review, Crystal City, VA, August 2019

[7] Edwards V, Triandaf I, McGuire L, Taylor C, Sofge D, Schwartz IB, “Reproducible Experimental Results of Swarming Behavior Using Mixed Reality,” ICRA Workshop, Montreal, Canada, May 2019

[8] Edwards V, “Debugging a Robot for the Experimental Verification of a Swarm Behavior,” MORS Special Meeting on Autonomy, Trust in Autonomy Panel, Laurel MD, February 2019

[9] Edwards V, “Explaining Robot Behavior Using Capability Analysis Tables,” Applied Physics Lab AI Colloquium, Laurel MD, May 2019

[10] Edwards V, Gaskell P, Olson E,“Calibrated Mixed Reality For Scalable Multi-Robot Experiments,” Navy Center for Applied Research in AI Invited Speaker NRL, Washington DC, March 2018

Poster Presentation

[1] Edwards V, “Macroscopic Ensemble Modeling and Control of Robot Teams in Unknown Dynamic Environments,” NDSEG Fellowship Class of 2021 Conference, San Antonio, TX, July 2023

[2] Edwards V, “Evaluating Robustness of Pattern Formation using Mixed Reality,” Naval Innovation Science and Engineering Technology Exchange Meeting, Charleston, SC, February 2020

[3] Edwards V, “Debugging a Robot for the Experimental Verification of a Swarm Behavior,” Naval Innovation Science and Engineering Technical Meeting, Port Hueneme, CA, March 2019

[4] Edwards V, Olson E, “Mixed Reality for Scalable Multi-Robot Testing,” RSS Women’s Workshop, MIT, July 2017.

PROFESSIONAL SERVICE

[1] Program Committee member for Intelligent Robotics and Multi-Agent Systems technical track on the

40th ACM Symposium on Applied Computing (SAC 2025)

[2] Co-Presenter at Roxborough Public Library Fun with Robotics Program, “How to Build Miniature Autonomous Surface Vehicles (mASVs),” April 2024

[3] Member of the GRASP Student, Faculty, Industry (SFI) Seminar Series Committee, 2024 - present

[4] Co-organizer of the IROS 2023 Workshop: Robotics for the Blue Economy and Climate Resiliency

[5] Presenter at the Roxborough Public Library Fun with Robotics Program, “Are two robots better than one,” June 2023

[6] Member of GRASP Student Advisory Committee (SAC), 2023

[7] Co-Chair of ICRA 2022 Session: Industrial and Environmental Robotics and Monitoring

[8] Student organizer of the ICRA 2022 Workshop: Addressing Ethical and Technical Challenges in the Development, Use and Governance of Lethal Autonomous Weapons Systems

[9] Co-Chair of the Student Committee for the Ethical and Social Implications of Robotics October 2021 - September 2022

[10] Mechanical Engineering Graduate Association (MEGA) Student Representative, Fall 2021 - Fall 2022

[11] Project Mentor for AI4ALL@GRASP Summer 2021

[12] Co-Chair of Inclusion@RSS, at the Robotics Science and Systems (RSS) conference 2020

[13] Member of the Verification for Autonomous System Working Group, (VASWG), Nov 2018 - Sep 2020

[14] Co-Organize the Navy Center for Applied Research in Artificial Intelligence Symposium Series, 2018- 2020

[15] Reviewed papers for ICRA ‘20, ‘22, ‘23, ‘24, ‘25, IROS ‘19, ‘22, ‘23, ‘24, and Robotics and Automation Letters (RAL) ‘22, ‘23, ‘24, ‘25 Transactions on Robotics (TRO) ‘24, Science Robotics ‘24

[16] Co-Organized The Women in Robotics Workshop IV, Robotics Science and Systems, 2018