

MATTHEW M ROMANO

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Education

University of Michigan <i>Robotics</i> , Dissertation Advisor: Ella M. Atkins	Ph.D.	Aug 2022
University of Michigan <i>Robotics</i>	M.S.	May 2019
University of Illinois Urbana-Champaign <i>Electrical Engineering (Computer Science Minor)</i>	B.S.	Dec 2016

Research Experience

Graduate Student Research Assistant <i>Autonomous Aerospace Systems Lab, Robotics Institute</i> <i>University of Michigan, Ann Arbor, MI</i> Planning, control, and estimation for diverse multi-UAS missions	Sep 2017 - Aug 2022
Research Engineer Intern <i>Sprite Robotics, Champaign, IL</i> Researched and implemented autonomous navigation and planning strategies for a robotic cat toy platform	Jan 2017 - May 2017
Undergraduate Research Assistant <i>Bretl Lab, Department of Aerospace Engineering</i> <i>University of Illinois, Champaign, IL</i> Compared performances of monocular simultaneous localization and mapping (SLAM) algorithms. Improved feature tracking algorithms by fusing camera data with inertial measurement unit (IMU) data.	Oct 2015 - Dec 2016

Research Interests

My research interests include cooperative control, path planning, and higher level autonomy for teams of unmanned aircraft systems (UAS). I have considered diverse missions including formation control for UAS traffic management, multilift slung load transportation, and multi-UAS wildfire detection and mapping. I place importance on the experimental validation of actual systems with real-world considerations.

Conference Publications

1. M. Romano, P. Kuevor, D. Lukacs, O. Marshall, M. Stevens, H. Rastgoftar, J. Cutler, and E. Atkins, "Experimental evaluation of continuum deformation with a five quadrotor team," in 2019 American Control Conference (ACC). IEEE, Jul 2019. <http://dx.doi.org/10.23919/ACC.2019.8815266>
2. M. Romano, Y. Chen, P. Kuevor, O. Marshall, and E. Atkins, "Nailed it: Autonomous roofing with a nailgun-equipped octocopter," in AIAA AVIATION 2021 FORUM, p. 3211, 2021. <https://doi.org/10.2514/6.2021-3211>

3. M. Romano, H. Uppaluru, H. Rastgoftar, and E. Atkins, "Quadrotor Formation Flying Resilient to Abrupt Vehicle Failures via a Fluid Flow Navigation Function," 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022 (Under Review). <https://arxiv.org/abs/2203.01807>

Journal Publications

1. J. Castagno, M. Romano, P. Kuevor, and E. Atkins, "Multi-unmanned-aerial-vehicle wildfire boundary estimation using a semantic segmentation neural network," *Journal of Aerospace Information Systems*, pp. 1-19, 2021. <https://doi.org/10.2514/1.I010912>
2. M. Romano, A. Ye, J. Pye, and E. Atkins, "Cooperative Multilift Slung Load Transportation using Haptic Admittance Control Guidance," *Journal of Guidance, Control, and Dynamics*, 2022 (Under Review).

Teaching Experience

Co-Developer & Co-Instructor

Winter 2021

ROB 103: Robotics Mechanisms

University of Michigan, Ann Arbor, MI

Co-Created and co-taught an entire hands-on, freshmen-level, hybrid, Robotics course on short notice (1 month before the first day of class) from scratch. Successfully modified an existing mobile robot platform to use an A* (Arduino based board) for easier engagement. Designed, organized, purchased, soldered, and shipped 40 robot kits for in-person and remote students by the 3rd week of class. Developed and gave half of the technical lecture content (on electronics and programming). Developed and wrote half of the lab assignments (electronics, C++ and Python programming, communication).

Graduate Student Instructor

Winter 2020

EECS 592: Foundations of Artificial Intelligence

University of Michigan, Ann Arbor, MI

Honors and Awards

- First Place - AFRL Swarm and Search AI Competition (2019)
- First Place - Into the Dataverse Hackathon (2019)
- First Place - Engineering Research Symposium Scientific Visualization Award (2019)

Service

- Reviewer - AIAA Journal of Aerospace Information Systems (2021)
- Reviewer - IEEE Robotics and Automation Letters / ICRA (2020)
- Reviewer - IEEE Transactions on Control Systems Technology (2020)
- Reviewer - IET Control Theory & Applications (2020)
- Reviewer - IEEE Transactions on Intelligent Transportation Systems (2020)
- Reviewer - Journal of Aerospace Science & Technology (2019)
- Reviewer - AIAA Journal of Guidance, Control & Dynamics (2019)
- Reviewer - AIAA Journal of Aerospace Information Systems (2019)