Michael Hagenow

hagenow@mit.edu | +1 608 556 6394 | hageneaux.com | He/Him/His

Education

University of Wisconsin - Madison PhD in Mechanical Engineering | 2023

- Minor: Computer Science • Advisor: Michael Zinn
- Dissertation: Toward Effective Human-Robot Teaming Through Corrections

University of Wisconsin - Madison | MS in Mechanical Engineering | 2019

Tufts University | BS in Mechanical Engineering | 2014

Employment

Massachusetts Institute of Technology | Postdoctoral Fellow | 2023-Present
Aeronautics and Astronautics | PI: Julie Shah | Interactive Robotics Group

- Investigating how artificial intelligence can enable human-robot teaming in high-mix, low-volume manufacturing settings through the development of multi-mechanism and multi-robot paradigms.

NASA - Johnson Space Center | Research Intern - ER4 | 2021
Supervisor: Dr. Kimberly Hambuchen, Mentor: Evan Laske

- Investigated human-in-the-loop corrective methods for semi-automated fitting of affordance templates/primitives for use in remote robot programming during intra-vehicular activities (IVAs).

Epic Systems |Technical Services | 2014-2017
Manager - MyChart. Clinical Data Mychart Lead.

- Managed 5-6 direct reports. Responsible for technical support for several large hospital contracts ($1M+). VB development of internal accounting tools.

Honors & Awards
- MIT Work of the Future Fellow | 2023
- Postdoctoral Fellowship Program for Engineering Excellence | 2023
- Grainger Wisconsin Distinguished Graduate Fellowship (WDGF) | 2022
- Phi Kappa Phi | 2019
- Mitchell Fellowship | 2018
- O'Leary Design Award | 2014
- Tau Beta Pi | 2014

Publications

Up-to-date publications also on Google Scholar

Journal Articles

- J4. Hagenow, M., Senft, E., Orr, N., Radwin, R., Gleicher, M., Mutlu, B., Losey, D., and Zinn, M. "Coordinated Multi-Robot Shared Autonomy Based on Scheduling and Demonstrations," IEEE Robotics and Automation Letters, vol. 8, no. 12, pp. 8335-8342, December 2023.

- J3. Senft, E., Hagenow, M., Welsh, K., Radwin, R., Zinn, M., Gleicher, M., and Mutlu, B. (2021) "Task-Level Authoring for Remote Robot Teleoperation," Front. Robotics, AJ 8:707149.

- J2. Hagenow, M., Senft, E., Radwin, R., Gleicher, M., Mutlu, B. and Zinn, M. "Informing Real-time Corrections in Corrective Shared Autonomy Through Expert Demonstrations," IEEE Robotics and Automation Letters, vol. 6, no. 4, pp. 6442-6449, Oct. 2021.

- J1. Hagenow, M., Senft, E., Radwin, R., Gleicher, M., Mutlu, B. and Zinn, M. "Corrective Shared Autonomy for Addressing Task Variability," IEEE Robotics and Automation Letters, vol. 6, no. 2, pp. 3720-3727, April 2021.

Refereed Conference Papers

- C9. Hagenow, M., Senft, E., Radwin, R., Gleicher, M., Zinn, M., and Mutlu, B. "A System for Human-Robot Teaming through End-User Programming and Shared Autonomy," Proceedings of the 2024 ACM/IEEE International Conference on Human-Robot Interaction. ACM, 2024.

- C8. Konstant, A., Orr, N., Hagenow, M., Gundrum, I., Mutlu, B., Zinn, M., Gleicher, M., and Radwin, R. "Human-Robot Collaboration in a Sanding Task," Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 2023.

- C7. Doshi, M., Hagenow, M., Radwin, R., Gleicher, M., Mutlu, B. and Zinn, M. "Handheld Haptic Device with Coupled Bidirectional Input," 2023 IEEE World Haptics Conference (WHC), 2023.

- C6. Hagenow, M., Senft, E., Laske, E., Hambuchen, K., Fong, T., Radwin, R., Gleicher, M., Mutlu, B. and Zinn, M. "Registering Articulated Objects With Human-in-the-loop Corrections," 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.

- C5. Senft, E.[†], Hagenow, M.[†], Praveena, P., Radwin, R., Zinn M., Gleicher, M., and Mutlu, B. "A Method For Automated Drone Viewpoints to Support Remote Robot Manipulation," 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022.

- C4. Zhang, B., Hagenow, M., Mutlu, B., Gleicher, M, and Zinn, M. "Assessing the Perceived Realism of Kinesthetic Haptic Renderings Under Parameter Variations" 2022 IEEE Haptics Symposium (HAPTICS). IEEE, Accepted for Publication.

- C3. Senft, E., Hagenow, M., Radwin, R., Zinn M., Gleicher, M., and Mutlu, B. "Situated Live Programming for Human-Robot Collaboration," The 34th Annual ACM Symposium on User Interface Software and Technology. 2021.

- C2. Hagenow, M., Zhang, B., Mutlu, B., Zinn, M., and Gleicher, M. "Recognizing Orientation Slip in Human Demonstrations," 2021 International Conference on Robotics and Automation (ICRA), 2021.

- C1. W. Hu, Q. Fan, A. H. Nicholas, M. C. Hagenow, and A. T. Ohta. "Bubble micro-manipulator for co-operative micro-manipulation," 9th IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE-NEMS), Honolulu, HI, Apr. 2014.

Refereed Workshop Papers

- W4. Doshi, M., Zhang, B., Hagenow, M., Gleicher, M., Mutlu, B., Radwin, R., and Zinn, M. "Bidirectional 1-DOF Handheld Haptic Device for Precise Differential Process Control," Mentoring Forum at 2022 IEEE Haptics Symposium, 2022.

- W3. Zhang, B., **Hagenow, M.**, Mutlu, B., Gleicher, M., and Zinn, M. "Effect-Adjective Associations of Kinesthetic-Based Haptic Renderings," Mentoring Forum at 2022 IEEE Haptics Symposium, 2022.
- W2. **Hagenow, M.**, Zinn, M., Fong, T., Laske, E., and Hambuchen, K. "Affordance Template Registration via Human-in-the-loop Corrections," Advances in Space Robotics and Back to Earth Workshop at 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.
- W1. Zhang, B., **Hagenow, M.**, Mutlu, B., Zinn, M., and Gleicher, M. "Characterizing the Effects of Haptic Rendering Parameter Variations on Perceived Kinesthetic Rendering Accuracy," 2021 IEEE World Haptics Conference (WHC), 2021, pp. 868-868.

† Co-First Authorship

Invited Talks
- Boeing Cobot Summit | 2023
- Tufts Mechanical Engineering Colloquium | 2023
- Interactive Robotics Group at MIT | 2022
- NASA University Leadership Initiative Tech Talk | 2021 (virtual)
- NASA Intelligent Robotics Group (IRG) | 2021 (virtual)
- NASA Transformative Aeronautics Concepts Program (TACP) Showcase | 2021 (virtual)

Mentoring and Advising
I meet regularly with mentees to establish research goals, brainstorm, and grow skills for future careers. Students have consequently been admitted to top robotics graduate programs
(e.g., UPenn, CMU, Georgia Tech, UW, UTA).

Graduate Students
- Nitzan Orr | 2021-2023 | Shared Autonomy and Human-in-the-loop Robotic Sanding
- Megh Doshi | 2020-2023 | Design of a Mobile Bidirectional Haptic Input

Undergraduate Students
- Kevin Macauley | 2021-2023 | Affordance Template Registration Using Corrections
- Nicole Gathman | 2021-2023 | Affordance Template Registration Using Corrections
- Mohamed Safwat | 2021-2022 | State Estimation and Methods for 6D Input
- Ahmed Khalil | 2021-2022 | State Estimation and Methods for 6D Input
- Yash Hindka | 2021 | Dynamic Camera During Robot Teleoperation via UAV
- Michael Matuszewski | 2020 | Real-time Force Display for Physical Interaction
- Saheen Feroz | 2019-2020 | Synopsis of Robot Trajectories and Interaction using Optimization
- Eric Wang | 2019-2020 | Force Sensing and Visualization using Low-cost Sensors

Teaching

Formal Instruction

- Guest Lecturer | ME739 - Advanced Robotic | UW–Madison | 2020
- Instructor of Record | ME346 - Intro to Feedback Controls | Uw–Madison | 2019
- Teaching Assistant | ME739 - Advanced Robotics* | UW–Madison | 2018
- Teaching Assistant | ME346 - Intro to Feedback Controls | UW–Madison | 2018
- Teaching Assistant | ME446 - Automatic Controls* | UW–Madison | 2018-2019
- Teaching Assistant | ME370 - Energy Systems Laboratory | UW–Madison | 2018
- Teaching Assistant | COMP11 - Intro to Computer Science | Tufts University | 2013-2014

* Distance Learning

Extracurricular

Teaching-As-Research Project (Delta Program)

• 2019 • Introducing problem-based learning (e.g., structured case studies) to the frequency domain loop-shaping unit of a controls class.

Tutorial Contributor (CTMS)

• 2018-2021 • Developed tutorial for Lead motor position control using a hobby DC motor. Tutorials to be hosted on the CTMS website.

Lab Development

• 2018 • Developed real time control platform using Simulink and three labs (system identification, PID, and Frequency Domain Lead Control). Fabricated 10 control platforms using industrial connectors and hardware (B&R Automation). Presented posters at the 2018 Midwest Robotics Workshop (TTIC) and 2018 ADEIL Conference.

Service Activities

Organization

• Co-organizer - Wisconsin Robotics Seminar Series | 2021-2023
• Co-chair - PHRI & Shared Autonomy for PHRI sessions at IROS | 2021

Referree Services

• Annual Reviews in Control

• AAAI Conference on Artificial Intelligence

• Frontiers in Robotics and AI

• IEEE Robotics and Automation Letters (RAL)

• International Journal of Social Robotics (SORO)

• Human-Computer Interaction

• IEEE International Conference on Robotics and Automation (ICRA)

• IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

- Artificial Intelligence for Human-Robot Interaction (AI-HRI)

Selected Outreach

- Workshop Volunteer, New Educator's Orientation | 2019-2023

- Engineering Expo | 2019, 2022, 2023