Mike **Hagenow**

PhD Student · University of Wisconsin-Madison

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Research Interests

Human-Robot Physical Interaction Modeling and Shared Control

Research focuses on answering how shared control in robotics can assist skilled workers in completing complex and often injury-prone tasks. Broad research interests include non-linear control, applications of learning models (e.g., DMPs, NNs) in human-robot interaction models, and dynamics of physical interaction.

Co-advised by Michael Zinn, Michael Gleicher, and Bilge Mutlu (NASA ULI).

Education

University of Wisconsin - Madison — *Madison, WI*

Ph.D. in Mechanical Engineering — *2018 - In progress*

- Minor: Computer Science
- Advisor: Michael Zinn, Ph.D.

University of Wisconsin - Madison — *Madison, WI*

M.S. in Mechanical Engineering — *2018 - 2019*

- Phi Kappa Phi

Tufts University — *Medford, MA*

B.S. in Mechanical Engineering — *2010 - 2014*

- Tau Beta Pi, Dean's List (7/7 eligible semesters)

Experience

University of Wisconsin - Madison — *Madison, WI*

Graduate Research Assistant — *2019 - Present*

- NSF grant exploring communication in human robot interaction. NASA University Leadership Initiative focused on aircraft manufacturing and development of shared robotic assistants for physically demanding and challenging tasks.

Epic Systems — *Madison, WI*

Manager - MyChart - Technical Services — *2014 - 2017*

- Managed 5-6 direct reports. Development and planning lead for Clinical Data for MyChart. Responsible for technical support for several large hospital contracts. VB Development of internal tools for accounting.

Honors & Awards

2019	**Phi Kappa Phi**, UW-Madison	*Madison, WI*
2018	**Mitchell Fellowship (Instructional Design)**, The Mitchell Institute	*Portland, ME*
2014	**O'Leary Design Award**, Tufts University	*Medford, MA*
2010	**Senator George J. Mitchell Scholarship**, The Mitchell Institute	*Portland, ME*
2009	**Rensselaer Medal**, Rensselaer Polytechnic Institute	*Troy, NY*

Publications

Journal Articles

J1. Subramani, G., **Hagenow, M.**, Gleicher, M., and Zinn, M. Constraint inference using pose and wrench measurements. *IEEE Transactions on Robotics (TR-O). Submitted.*

Conference Papers

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.*

Poster Presentations

P2. **M. Hagenow** and M. Zinn. Online Peer Learning Community for Controls Lab Curriculum. *Association for Distance Education and Independent Learning (ADEIL) Conference 2018.*

P1. **M. Hagenow** and M. Zinn. Inquiry-Based Labs for an Introductory Controls Class. *Midwest Robotics Workshop (TTIC) 2018.*

Teaching

Formal Instruction

2020	**Guest Lecturer**, ME739 - Advanced Robotics	*Madison, WI*
2019	**Instructor of Record**, ME346 - Intro to Feedback Controls	*Madison, WI*
2019	**Teaching Assistant**, ME739 - Advanced Robotics (Distance Learning)	*Madison, WI*
2018	**Teaching Assistant**, ME346 - Intro to Feedback Controls	*Madison, WI*
2018/19	**Teaching Assistant**, ME446 - Automatic Controls (Distance Learning)	*Madison, WI*
2018	**Teaching Assistant**, ME370 - Energy Systems Laboratory	*Madison, WI*
2013/14	**Teaching Assistant**, COMP11 - Intro to Computer Science	*Medford, MA*

Extracurricular

Teaching-As-Research Project *Madison, WI*

Delta Program (Guest Teaching) *2019*

- How does problem-based learning instruction of loop-shaping in the frequency domain affect student adaptive expertise and student perceived value of material?
- https://delta.wisc.edu/internship-overview/

Tutorial Contributor *Online*

Controls Tutorials Matlab Simulink *2018-2019*

- Developing real-time simulink tutorial for Lead motor position control (In Progress). Tutorials will be hosted on the official website (http://ctms.engin.umich.edu).

Lab Development *Madison, WI*

Intro to Feedback Controls *2018*

- Developed real time control platform using Simulink and three labs (system identification, PID, and Frequency Lead Control). Fabricated 10 control platforms using industrial connectors for improved durability.

Technical Skills

Programming	Python, C/C++, Matlab, Java, HTML/JS
Tools	ROS, V-REP, git, LaTeX, CMake
Robotic Platforms	Rethink Sawer, UR3/UR5, Franka Emika Panda, Kinova Mico/Jaco
Engineering	Matlab, Simulink (control system design certified), Labview, EES, Solidworks

Recent Service

2018-19	**Lab Tours (5-10 Annually)**, REACH Lab	*Madison, WI*
2018-19	**Volunteer Tutor - Algebra/Geometry**, West High School	*Madison, WI*
2017-19	**Alumni Interviewer**, Tufts University	*WI*
2019	**Haptics Demo**, Engineering EXPO	*Madison, WI*
2019	**Event Supervisor - Mechatronics and Aerial Scrambler**, Science Olympiad	*WI*