

Maegan Tucker

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EDUCATION

California Institute of Technology

PH.D. IN MECHANICAL ENGINEERING

2017-2023(anticipated)

- Academic Advisor: Dr. Aaron D. Ames

M.S. IN MECHANICAL ENGINEERING

2017-2019

- Overall GPA: 4.0/4.0

Georgia Institute of Technology

B.S. IN MECHANICAL ENGINEERING

2012-2017

- Overall GPA: 3.8/4.0, Major GPA: 3.88/4.0

RESEARCH

Research Interests

- Robotic assistive devices, bipedal robotic locomotion, human-robot interaction, preference-based learning

Publications

- [A.1] **Tucker, M.**, Novoseller, E., Kann, C., Sui, Y., Yue, Y., Burdick, J., & Ames, A. D. "Preference-Based Learning for Exoskeleton Gait Optimization." In 2020 IEEE International Conference on Robotics and Automation (ICRA), 2020.

Best Overall Paper Award (of 3,512 submissions) at ICRA 2020.

Best Paper in Human-Robot Interaction Award at ICRA 2020.

- [A.2] Gurriet, T., **Tucker, M.**, Duburcq, A., Boeris, G., & Ames, A. D. "Towards Variable Assistance for Lower Body Exoskeletons." IEEE Robotics and Automation Letters, 5(1), 266-273.

- [A.3] **Tucker, M.**, Cheng, M., Novoseller, E., Cheng, R., Yue, Y., Burdick, J. W., & Ames, A. D. "Human Preference-Based Learning for High-dimensional Optimization of Exoskeleton Walking Gaits." To appear at the 2020 IEEE International Conference on Intelligent Robots and Systems (IROS), 2020.

Submitted Papers

- [B.1] **Tucker, M.**, et al. "Restoring Locomotion for People with Paraplegia: From Theorems to Dynamic Exoskeleton Walking." Under Review.

Patents

- [C.1] Provisional patent (full patent in progress): Real-Time Feedback Module For Assistive Gait Training, Improved Proprioception, And Fall Prevention (CIT 8048-P)

FUNDING AND GRANTS

- NSF Graduate Research Fellowship (Awarded 2019): one of 2,000 awarded of 13,000 applicants. Fellowship consists of three-year annual stipend of \$34,000 along with a \$12,000 cost of education allowance for tuition and fees (paid to the institution)
- Caltech Mechanical and Civil Engineering Department *Big Ideas Fund*: One year grant for research focused on developing a soft ankle exoskeleton
- Theodore Y. Wu Graduate Fellowship: Graduate Tuition and Stipend for the 2017 Academic year.

TEACHING EXPERIENCE

- Teaching assistant for CDS 131: Linear Systems Theory (Fall 2018)

TEACHING WORKSHOPS

- STEMulate Learning Workshop: Closing the Gaps in Mathematics (October 6, 2020)
- Caltech Rise Program: Creating Math Skills Worksheets (January 29, 2020)

ACADEMIC WORKSHOPS

- ME Rising Stars Workshop (hosted by Berkeley), October 2, 2020

UNDERGRADUATE ADVISING

- Jesus Hernandez (Caltech Summer Undergraduate Research Fellowship (SURF) student, Summer 2018)
- Annabel Gomez (Caltech Freshman Summer Research Institute (FSRI) student, Summer 2019)
- Diana Frias Franco (FSRI student, Summer 2019)
- Allison Cheng (SURF student, Summer 2019)
- Paulina Ridland (SURF student, Summer 2019)
- Sofia Kwok (SURF student, Summer 2019)
- Lorenzo Shaikewitz (SURF student, Summer 2020)
- Toussaint Pegues (SURF student, Summer 2020)

MEDIA MENTIONS

Personal:

- The Caltech Breakthrough Campaign, “The Math of Human + Machine”, Nov 18 2019: [link](#)
- Women Doing Science, Oct 14 2019: [Facebook link](#) [Instagram Link](#)

Research:

- CNBC, “How robots are replacing wheelchairs to help people with disabilities walk again”, May 30 2020: [link](#)
- IEEE Spectrum, “Caltechs Brain-Controlled Exoskeleton Will Help Paraplegics Walk”, Jan 6 2020: [link](#)

HONORS AND AWARDS

- **Conference Awards:** Best Overall Paper ICRA 2020. Best Paper in Human-Robot Interaction ICRA 2020.
- **NSF Graduate Research Fellowship Program:** Awarded 2019
- **NSF Graduate Research Fellowship Program:** Honorable Mention 2017
- **Presidents Undergraduate Research Salary Award (Spring 2017):** \$1500 student research stipend
- **First Place for overall presentation** among 40 students in Georgia Techs S.U.R.E. REU program (Summer 2016).

INDUSTRY EXPERIENCE

MECHANICAL ENGINEERING CO-OP AT NCR CORPORATION (Fall 2014, Summer 2015, Spring 2016)

- Completed 3 full-time semester rotations working closely with a 5-person hardware engineering team.
- Contributed to the design, testing, manufacturing and release of 3 new Point of Sale (POS) terminals.

DIVERSITY EFFORTS

- Caltech Rise Tutoring: Volunteer for 2 hours every week tutoring local high-school girls in math and science. (2017-Current)
- Outreach Chair for Caltech Department of Mechanical and Civil Engineering (2020-Current)

SKILLS

- Programming Languages: Experienced - MATLAB, C++; Familiar - Python, Bash, HTML
- Modeling Software: Solidworks, AutoCad, Inventor, ProEngineer (Creo)
- Graphical Software: Inkscape, Adobe After Effects
- Machining: Certified to operate the Caltech Machine Shop (CNC Milling, Lathe, Waterjet, Vertical Band Saw, etc.)
- Languages: Native - English, Proficient - French