

EMILY A. KAMIENSKI

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EDUCATION

Massachusetts Institute of Technology

GPA: 5.0/5.0

Ph.D. Mechanical Engineering Major: Robotics & Controls Minor: Artificial Intelligence Expected Sept. 2024
S.M. Mechanical Engineering Graduated June 2021

Georgia Institute of Technology

GPA: 3.96/4.0 Major GPA: 4.0 /4.0

B.S. Mechanical Engineering Minor: Computer Science Graduated May 2019

RESEARCH

MIT

Graduate Research Assistant – d'Arbeloff Laboratory (Advisor: Harry Asada) Fall 2019-Present

- Developing linear model of whole body angular momentum, a metric for dynamic stability while walking, using lifted linearization and Koopman Operator Theory for control of a physical assistive device to aid stability while walking
- Created data driven elderly fall prediction algorithm using LSTM network to control reconfigurable mobility aid
- Conducted human subject tests at MIT clinical research center to obtain dynamic and kinematic data during loss of balance
- Enhanced mechanical design & automated movement of expandable snake-like robot

Teaching Assistant – Robotics 2.12 Class

Spring 2021, 2022

- Developed term project using remotely teleoperated robots and guided students in weekly lab sections
- Set up Universal Robot 5e and programmed in Python using ROS to perform pick and place tasks guided by computer vision
- Used ROS to enable communication between two robots with individual computers

Georgia Tech

Undergrad Research Assistant – Intelligent Robotics & Emergent Automation Lab

Fall 2017 to Spring 2019

- Created prototype UAV docking mechanism to independently attach/detach from moving ground vehicle
- Designed & built prototype robot to drive on cable through tree canopy at Morton Arboretum to collect data on vegetation growth
- Worked on serial communication protocol for test involving the use of multiple rotor vehicles to lift a payload

Undergrad Research Assistant – Advanced Mechanical Bipedal Experimental Robotics Lab

Fall 2016

- Worked in a team to build automated safety cart that would track the DURUS robot as it walks on a treadmill
- Machined multiple parts for cart using a milling machine and a lathe

Georgia Tech Motor Sports (Formula SAE)

2015 to 2018

Manufacturing Director:

- Created parts on CNC mill & lathe, organized team machine training, & performed design work on pedal box
- Controls Subsystem** - Design & fabrication work on pedals, steering, & clutch using SolidWorks; composite layups
Powertrain Subsystem - Designed fuel system with SolidWorks; fabricated it using water jet and metal break

WORK EXPERIENCE

Northrop Grumman Aerospace Systems – Flight Controls Technology

May to August 2019

Redondo Beach, California

- Modeled IMU gimbal table and developed control laws in Simulink
- Developed Real Time Component Framework (RTCF) using C++ and Python
- Autogenerated controller code and tested controller on physical system and verified it met requirements

Northrop Grumman Aerospace Systems – Advanced Manufacturing Technology & Innovation

May to August 2018

El Segundo, California

- Technical lead on development effort in support of out-of-autoclave curing for a confidential program
- Project deliverables have an expected savings on the order of \$1 million USD
- Collaborated on 5 activities in support of a \$10 million NCTA portfolio

United Technologies Aerospace Systems - Space Systems Division

May to August 2017

Windsor Locks, Connecticut

- Performed structural analysis using Patran FEA on ORION Multi-Purpose Crew Vehicle components
- Identified peak stresses and average weld stresses developed on a pump, accumulator, and heat exchangers
- Analyzed stress data induced by gravitational loads, normal modes, tube stub loads, and pressure loads

Carderock, Maryland

- Supported ship model tow tests and data collection, 3D modeled & fabricated floats for aircraft model

AWARDS & ACHIEVEMENTS

Mechanical Engineering Research Exhibition Honorable Mention - 2021

George Woodruff School Chair's Award, Georgia Tech - 2019

Astronaut Scholarship, awarded by Astronaut Scholarship Foundation – 2018-2019

Ford Blue Oval Vehicle Team Scholarship – 2016

Capitol Hill Maker Faire Presenter, presented prosthetic hand made with 3D printer I built, Washington DC - 2015

PUBLICATIONS & PATENTS

E. A. Kamienski, P. Bonato and H. Harry Asada, "Time-Critical Fall Prediction Based on Lipschitz Data Analysis and Design of a Reconfigurable Walker for Preventing Fall Injuries," in IEEE Access, doi: 10.1109/ACCESS.2023.3347263.

E. Kamienski and H.H. Asada, "Assessing Dataset Learnability Using Lipschitz Quotient Analysis Applied to Fall Prediction". ICRA, 2024. Under Review.

J. Bell, E. Kamienski, S. Teshigawara, H. Itagaki and H. H. Asada, "Gear Ratio Optimization of a Multifunctional Walker Robot Using Dual-Motor Actuation," *2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2021, pp. 9339-9346, doi: 10.1109/IROS51168.2021.9636482.

E. Kamienski and H. H. Asada, "Pants with Embedded Harness for Daily Use". US Patent 63/342601, Filed May 16, 2022. (Provisional)

E. Kamienski and H. H. Asada, "A Reconfigurable Walker for Predicting and Preventing Fall of Patients". US Patent 63/252,367, 5 10 2021. (Provisional)

MIT COURSEWORK

16.485 Visual Navigation for Autonomous Vehicles

6.S898 Deep Learning

6.832 Underactuated Robotics

2.74 Bioinspired Robotics

2.151 Advanced System Dynamics & Control

2.160 Identification, Estimation, & Learning

2.72 Elements of Mechanical Design

18.0851 Computational Science & Engineering

2.12 Intro to Robotics

2.77 Fundamentals of Precision Product Design

2.032 Dynamics

2.183 Biomechanics & Neural Control of Movement

SKILLS AND QUALIFICATIONS

Programming: Python, C++, Pytorch, Tensorflow, Matlab, Simulink, HTML, Git, LaTeX, MS Visual Studio

Robotics: ROS, Drake, OpenCV, Raspberry Pi, Arduino, Universal Robots

Engineering Software: SolidWorks, Patran, HSMWorks, Microsoft Office

Manufacturing: Manual/CNC mill & lathe, water jet, composite layups, 3D printing (built printer), MIG welding

Certifications: Red Cross first aid & CPR, SOLO wilderness first responder

Extracurricular Activities: Reading, half marathons, triathlons, backpacking, & playing trumpet

LEADERSHIP

President of Mechanical Engineering Graduate Association of Women, *MIT*

May 2022 to present

Graduate Women in Robotics Professional Development Chair

May 2023 to present

Treasurer of Maker Workshop, *MIT*

Fall 2022 to Summer 2023

Mentor at Maker Workshop, *MIT*

Fall 2021 to Spring 2023

Robotics 2.12 TA, *MIT*

Spring 2021, 2022

Tau Beta Pi Corporate Relations Officer, *GT*

Fall 2018 to Spring 2019

Manufacturing Director of GT Motorsports, *GT*

Fall 2017 to Spring 2018