

EMILY SHEETZ

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EDUCATION

University of Michigan

August 2018 - Present

PhD, Computer Science and Engineering

GPA: **3.940** / 4.0

Artificial Intelligence

Robotics

Member of Ensemble of Computer Science and Engineering Ladies+ (ECSEL+)

Member of Graduate Society of Women Engineers (GradSWE)

University of Michigan

August 2018 - May 2021

MS, Computer Science and Engineering

GPS: **3.940** / 4.0

Monmouth College

August 2014 - May 2018

BA, Mathematics and Computer Science

GPA: **3.975** / 4.0

Spanish Minor

Honors Program

Summa Cum Laude

Member of Blue Key Honors Society

Member of Sigma Delta Pi, Spanish Honors Society

Member of Alpha Lambda Delta

RESEARCH

Affordance Representation and Execution

January 2019 - Present

University of Michigan

Ann Arbor, MI

- Explore use of object affordances to achieve complex robot manipulation tasks
- Extend representation of object affordances to include controllers to improve manipulation abilities
- Lead project conception and implementation and work collaboratively with students

Natural Language Processing

August 2017 - May 2018

Monmouth College

Monmouth, IL

- Trained a Generative Adversarial Network (GAN) to generate sentences of text on the character level
- Explored how probabilistic language models could be quantitatively evaluated using perplexity
- Defined the problem, investigated methods, and planned the execution of the research plan
- Presented results of mathematics and computer science senior research projects to faculty and students

Analog and Digital Sound Synthesis

August 2017

Monmouth College

Monmouth, IL

- Introduced to software for high quality sound recording and visualizing sound waves
- Explored FM synthesis with non-sinusoidal carrier waves using the LittleBits Synth Kit
- Presented research to faculty and students

Optimized Snapshot-Based Visual Homing for UAVs

May 2017 - July 2017

Auburn University

Auburn, AL

- Researched visual homing on unmanned aerial vehicles (UAVs)
- Introduced to Python, OpenCV, and machine learning implementations

- Implemented simulation framework for testing techniques in MATLAB
- Worked independently to research, design simulation framework, and find solutions

Design of a Mathematical Model for an Autonomous Vehicle

June 2016 - August 2016

University of Arizona

Tucson, AZ

- Used system identification to develop a mathematical model for internal vehicle dynamics
- Introduced to autonomous systems, control theory, and model predictive control
- Worked independently to research, analyze data, troubleshoot, and solve problems
- Operated the Cognitive Autonomous Test (CAT) Vehicle for project testing

Analysis of Chaotic Walks on a Plinko Board

August 2015

Monmouth College

Monmouth, IL

- Conducted experiments for introduction into the mathematics of chaos theory
- Supervised students during Summer Opportunity for Intellectual Activity projects
- Presented research to faculty, students, and community members

Particle Image Velocimetry for Flow Around an Airfoil

August 2014 - May 2015

Monmouth College

Monmouth, IL

- Investigated water flow around airfoils at angles of attack using particle image velocimetry
- Operated lab equipment including lasers, flow cell, and Phantom v9.1 high speed camera
- Created poster presentation and presented research to students and faculty members

High Speed Imagery and Mathematical Modeling

August 2014

Monmouth College

Monmouth, IL

- Focused on experiment design, data analysis, and introduction to mathematical modeling
- Collaborated with mathematics majors to conduct experiments
- Gained experience designing experiments and using Mathematica and MATLAB

WORK EXPERIENCE

Research Mentor

June 2021 - Present

Lumiere Education

Virtual

- Mentor high-school students on research projects related to computer science and robotics
- Explain reading and writing academic research papers during one-on-one weekly meetings
- Advise on research question, project design, code implementation, and research paper deliverables

Research Intern

August 2020 - Present

NASA Johnson Space Center

Houston, TX

- NASA Space Technology Graduate Research Opportunities (NSTGRO) application and acceptance based on project proposal
- Collaborate with employees at JSC to incorporate my work into their existing projects with Valkyrie
- Present research findings at regular meetings
- Prepare quarterly progress reports and annual research plans

Engineering Teaching Consultant

August 2020 - Present

University of Michigan

Ann Arbor, MI

- Consult with teaching assistants to address teaching challenges
- Review teaching philosophy statements
- Learn about best teaching practices and pedagogy research to share during consultations

Academic Success Program Tutor*University of Michigan*

January 2019 - Present

Ann Arbor, MI

- Tutor undergraduate level mathematics and computer science courses
- Explain concepts and work through examples with student athletes one-on-one
- Practice helpful studying, reading, and note-taking habits

Graduate Student Instructor*University of Michigan*

August 2019 - May 2020

Ann Arbor, MI

- Prepare for and lead weekly discussion sections to review course material and clarify homework concepts
- Work with students one-on-one during office hours to address questions and concerns with the course
- Collaborate with staff members to write and grade exams, handle exam management, write assignments

Research Intern*TRAC Labs*

June 2019 - August 2019

Webster, TX

- Developed a hierarchy of single- and multi-objective potential field controllers
- Explored practical use of controllers through experiments on the TRACArm robot
- Worked with the Robotics Lab to discuss ideas and implementation details within existing software

Computer Science Tutor*Monmouth College*

August 2017 - May 2018

Monmouth, IL

- Utilized knowledge of programming practices and languages C++, Java, and Python
- Lead group discussions of material and explain concepts one-on-one
- Encouraged students to think about problems and solutions from new perspectives

Computer Science Lab Assistant*Monmouth College*

August 2016 - May 2017

Monmouth, IL

- Assist in Introduction to Computer Science and Introduction to Programming labs
- Lead group discussions of material and explain concepts one-on-one
- Encourage students to think about problems and solutions from new perspectives

Math Tutor*Monmouth College*

August 2016 - May 2017

Monmouth, IL

- Tutor high school student in algebra in one-on-one sessions
- Explain concepts and problem-solving strategies
- Talk student through homework problems to practice discussed strategies

Writing Tutor*Monmouth College*

May 2016 - May 2018

Monmouth, IL

- Provide direction to students at any point in the writing process
- Utilize nondirective tutoring methods to help students to improve their writing process
- Develop relationships with students through encouragement and validation of their efforts

Speech Assistant*Monmouth College*

August 2015 - May 2018

Monmouth, IL

- Assist students at any point in the process of drafting or delivering a speech
- Observe speeches, evaluate speakers needs, and provide feedback on speeches
- Develop relationships with students by encouraging them and supporting their efforts

Research Assistant*Auburn University*

May 2017 - July 2017

Auburn, AL

- Worked under the supervision of Dr. Saad Biaz and Dr. Richard Chapman
- Collaborated with peers to research, develop approach to problem, and write code
- Wrote academic paper, created poster, and presented research

Research Assistant*University of Arizona*

June 2016 - August 2016

Tucson, AZ

- Worked under the supervision of Dr. Jonathan Sprinkle and doctoral students
- Collaborated with peers to research, write MATLAB scripts, and design experiments
- Experienced writing academic papers and presenting research

Fulton Hall Resident Assistant*Monmouth College*

August 2015 - May 2017

Monmouth, IL

- Plan social programs and assist with organizing collaborative educational programs
- Provide emotional and academic support for residents and residence hall staff
- Create a community on the floor and in the residence hall with open-door policy

TECHNICAL STRENGTHS

C++
Python
Java
MATLAB
Mathematica
JavaScript
HTML

PRESENTATIONS

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| RSS Workshop on Declarative Representations in Robot Control | July 2021 |
| Composable Causality in Semantic Robot Programming | |
| Lightning Talk and Poster Presentation | |
| RSS Workshop on Artificial Intelligence and Manipulation for Robotics | July 2021 |
| Composable Causality in Semantic Robot Programming | |
| Poster Presentation | |
| Tri-Section Meeting of the Mathematical Association of America (MAA) | March 2018 |
| Optimized Snapshot-Based Visual Homing for UAVs | |
| Oral Presentation | |
| <i>Recipient of Outstanding Undergraduate Research (OUR) Award from the Illinois Section (ISMAA)</i> | |
| Scholar's Day Presentation on Mathematics Capstone Project | April 2018 |
| Evaluating Horror Text Generated by Probabilistic Language Models | |
| Poster Presentation | |
| Scholar's Day Presentation on Computer Science Capstone Project | April 2018 |
| Writing Horror Text Using Generative Adversarial Networks with Memory | |
| Poster Presentation | |
| Presenter at First Science Symposium | April 2018 |
| Probabilistic and Machine Learning Approaches to Text Generation | |
| Oral Presentation | |

Scholar's Day Presentation on Honors Capstone Project Mathematics and the Philosophy of Chaos Oral Presentation	April 2017
Scholar's Day Presentation on Historical Documents Research Balancing Equality and Freedom: An Examination of Declarations of Independence Poster Presentation	April 2016
Scholar's Day Presentation on Mathematics Research Particle Image Velocimetry Experiments for Flow Around an Airfoil Poster Presentation	April 2015
Scholar's Day Presentation on Gender Disparity in Education Oral Presentation	April 2015

FUNDING APPLICATIONS

NASA Space Technology Graduate Research Opportunities (NSTGRO) Accepted for funding and collaboration August 2020 to Present	November 2019
National Science Foundation Graduate Research Fellowship Program	October 2019
National Science Foundation National Robotics Initiative 2.0 Grant Proposal	February 2019
NASA Space Technology Research Fellowship (NSTRF)	November 2018
National Science Foundation Graduate Research Fellowship Program	October 2017

ACADEMIC ACHIEVEMENTS

Advancement to PhD Candidacy	September 2021
Pass PhD Preliminary Examination	June 2021
Monmouth College Dean's List	August 2014 - May 2018
Paul Cramer Prize for Outstanding Work in Upper-Level Mathematics	April 2018
Computer Science Award for Senior Project	April 2018
Outstanding Undergraduate Research (OUR) Award at MAA Conference	March 2018
Robert Minter Prize for Student Working to Maximum Potential	April 2017
Paul Cramer Prize for Outstanding Work in Upper-Level Mathematics	April 2017
Computer Science Award for Introductory Sequence	April 2017
Ray A. Schwind Scholarship for Sciences	April 2016
Ray A. Schwind Scholarship for Sciences	April 2015
Hugh R. Beveridge Prize for Outstanding Work in Intermediate Mathematics	April 2015
Speaker Showcase Participant and Winner	December 2014
Illinois Seal of Biliteracy for English and Spanish	May 2014

LEADERSHIP AND VOLUNTEERING EXPERIENCES

CSE Department Faculty Candidate Grad Student Host	March 2021
Computer Science and Robotics Visit Day Volunteer	March 2019 - April 2019
CSE Department Take Your Child To Work Day Volunteer	April 2019

Wind Ensemble Flute Section Leader	August 2016 - May 2018
Wind Ensemble President	August 2017 - May 2018
Wind Ensemble Secretary	August 2016 - May 2016
Marching Band Flute Section Leader	August 2015 - May 2018
Marching Band Woodwind Captain	August 2016 - May 2018
Blue Key Honor Society Secretary	March 2017 - March 2018
Monmouth College Admissions Events Volunteer	August 2015 - May 2018
Jamieson Center and Strom Center Thrift Shop Volunteer	August 2015 - May 2016
SO <i>f</i> IA Activities Coordinator	August 2015
Monmouth College Bands Dodgeball Tourmanment Supervisor	February 2014