EMILY SHEETZ

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EDUCATION

University of Michigan *August 2018 - Present*
PhD, Computer Science and Engineering GPA: **4.0** / 4.0
Artificial Intelligence
Robotics

Member of Ensemble of Computer Science and Engineering Ladies+ (ECSEL+)
Member of Graduate Society of Women Engineers (GradSWE)

Monmouth College *August 2014 - May 2018*
B.A., 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

Graduate Student Instructor August 2019 - Present
University of Michigan *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
- Write and grade exams, write assignments, oversee grading of assignments

Academic Success Program Tutor January 2019 - Present
University of Michigan *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 notetaking habits

Research Intern June 2019 - August 2019
TRACLabs *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 August 2017 - May 2018
Monmouth College *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 August 2016 - May 2017
Monmouth College *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 August 2016 May 2017
Monmouth College *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 May 2016 - May 2018
Monmouth College *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 August 2015 - May 2018
Monmouth College *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 May 2017 - July 2017
Auburn University *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 June 2016 - August 2016
University of Arizona *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 August 2015 - May 2017
Monmouth College *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

Java
C++
MATLAB
Python
Mathematica
JavaScript
HTML

PUBLICATIONS

PRESENTATIONS

Tri-Section Meeting of the Mathematical Association of America (MAA) March 2018
Optimized Snapshot-Based Visual Homing for UAVs
Oral Presentation
Recipient of Outstanding Undergraduate Research (OUR) Award from the Illinois Section (ISMAA)

Scholar's Day Presentation on Mathematics Capstone Project April 2018
Evaluating Horror Text Generated by Probabilistic Language Models

Scholar's Day Presentation on Computer Science Capstone Project April 2018
Writing Horror Text Using Generative Adversarial Networks with Memory

Presenter at First Science Symposium April 2018
Probabilistic and Machine Learning Approaches to Text Generation

Scholar's Day Presentation on Honors Capstone Project April 2017
Mathematics and the Philosophy of Chaos

Scholar's Day Presentation on Historical Documents Research April 2016
Balancing Equality and Freedom: An Examination of Declarations of Independence

Scholar's Day Presentation on Mathematics Research April 2015
Particle Image Velocimetry Experiments for Flow Around an Airfoil

Scholar's Day Presentation on Gender Disparity in Education April 2015

FUNDING APPLICATIONS

NASA Space Technology Graduate Research Opportunities (NSTGRO) Applicant November 2019

National Science Foundation Graduate Research Fellowship Program Applicant October 2019

National Science Foundation National Robotics Initiative 2.0 Grant Proposal February 2019

NASA Space Technology Research Fellowship (NSTRF) Applicant November 2018

National Science Foundation Gratuate Research Fellowship Program Applicant October 2017

ACADEMIC ACHIEVEMENTS

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 Minteer Prize for Student Working to Maximum Potential	April 2017
Paul Cramer Prize for Oustanding Work in Upper-Level Mathematics	April 2017
Computer Science Award for Introductory Sequence	April 2017
Ray A. Schwind Scholarship for Sciences	April 2016
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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

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
SOfIA Activities Coordinator	August 2015
Monmouth College Bands Dodgeball Tourmanment Supervisor	February 2014