

COURTNEY MCBETH

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EDUCATION

University of Illinois at Urbana-Champaign

August 2021 – Present

PhD, Computer Science

Advisor: Nancy Amato

GPA: 3.91/4.00

Cornell University

August 2017 – May 2021

BS, Computer Science and Electrical and Computer Engineering

Dyson Business Minor for Engineers

Graduated Magna Cum Laude

GPA: 3.822/4.300

RESEARCH INTERESTS

- Multi-robot Systems
- Task and Motion Planning
- Motion and Path Planning
- Human-robot Interaction

PUBLICATIONS

- **C. McBeth**, J. Motes, M. Morales, N. M. Amato, “Hypergraph-based Multi-robot Motion Planning with Topological Guidance,” arXiv: 2311.10176. (*Under review*)
- R. Moan, **C. McBeth**, M. Morales, N. M. Amato, K. Hauser, “Experience-based Multi-agent Pathfinding with Narrow Corridors.” (*Under review*)
- **C. McBeth**, J. Motes, D. Uwacu, M. Morales, N. M. Amato, "Scalable Multi-Robot Motion Planning for Congested Environments With Topological Guidance," in IEEE Robotics and Automation Letters, vol. 8, no. 11, pp. 6867-6874, Nov. 2023, doi: 10.1109/LRA.2023.3312980. (*To be presented at ICRA 2024*)
- A. Attali, S. Ashur, I. B. Love, **C. McBeth**, J. Motes, D. Uwacu, M. Morales, N. M. Amato, “Evaluating Guiding Spaces for Motion Planning,” Evaluating Motion Planning Performance Workshop (IROS-EMPP), Kyoto, Japan, arXiv:2210.08640, Oct 2022.

POSTER PRESENTATIONS

- **C. McBeth**, J. Motes, M. Morales, and N. M. Amato, “Hypergraph-based Multi-Robot Motion Planning with Topological Guidance”, Poster presented at: IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Workshop on Enabling Robot Swarms Across Scales; October 5, 2023; Detroit MI.

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- **C. McBeth**, J. Motes, D. Uwacu, M. Morales, and N. M. Amato, “Scalable Multi-robot Motion Planning with Topological Guidance”, Poster presented at: CRA-WP Grad Cohort for Women; April 22, 2023; San Francisco, CA.

RESEARCH AND PROFESSIONAL EXPERIENCE

University of Illinois Parasol Lab, Dr. Nancy Amato

Research Assistant

August 2021 - Present

- Develop novel multi-robot motion planning methods that achieve improved scalability and solution quality.
- Mentor undergraduate and beginning graduate students within the research group.
- Contribute to collaborations with industry partners including Foxconn Interconnect Technologies and IBM.
- Lead the Parasol Planning Library (PPL) Open Source Project to make the lab’s novel robot task and motion planning library available to the public.

Cornell University Autonomous Sailboat Team (CUSail)

Navigation Subteam Lead

May 2020 – May 2021

- Managed a team of undergraduates engineering the hardware and software components of a robotic sailboat.
- Supervised the integration of the electrical and mechanical components of the sailboat.

Embedded Systems Engineer

September 2019 – May 2021

- Wrote the main autonomous navigation algorithm using C and Python.
- Designed printed circuit boards (PCBs) to integrate with a PIC32 microcontroller and a Raspberry Pi.
- Integrated sensors (GPS, LiDAR, anemometer, and encoder) into the sailboat system.
- Implemented a computer vision algorithm to detect buoys.

Ford Motor Company

June 2020 – August 2020

Information Technology Intern

- Worked on front-end and back-end web development projects.
- Practiced continuous integration, test driven development, and pair programming.

The Depository Trust and Clearing Corporation

June 2019 – July 2019

Application Development Intern

- Transitioned applications between database management systems.
- Wrote SQL code to manage company databases.

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June 2018 – August 2018

Electrical Engineering Intern

- Selected electrical components for medical devices.
- Tested printed circuit board functionality.

TEACHING EXPERIENCE

AI4ALL

Teaching Assistant, Discover AI Program, Fall 2022

- Taught lab sessions that introduced students to machine learning methods.
- Graded lab assignments and final projects.

Cornell University

Teaching Assistant, CS 1112, Intro to Computing using MATLAB, Spring 2021

- Taught both in-person and online laboratory sections.
- Held office hours.
- Wrote exam questions.
- Graded lab work, projects, and exams.

Head Teaching Consultant, CS 1112, Intro to Computing using MATLAB, Fall 2020

- Supervised the undergraduate teaching consultants.
- Held office hours.
- Created the final project.
- Graded lab work, projects, and exams.

Teaching Consultant, CS 1112, Intro to Computing using MATLAB, Fall 2018 – Spring 2020

- Held office hours.
- Graded lab work, projects, and exams.

HONORS AND AWARDS

- Selected Participant at CRA-WP's Grad Cohort for Women, San Francisco April 2023
- Dean's List (*Cornell University*) Fall 2017 – Spring 2021

TECHNICAL KNOWLEDGE

- Python
- Robot Operating System
- HTML/CSS/React
- C/C++
- MATLAB
- PyTorch
- Java
- Embedded Systems
- Fusion 360