

COURTNEY MCBETH

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EDUCATION

University of Illinois Urbana-Champaign August 2021 – Present
PhD, Computer Science GPA: 3.92
Advisor: Dr. Nancy M. Amato

Cornell University August 2017 – May 2021
BS, Computer Science and Electrical and Computer Engineering GPA: 3.822
Dyson Business Minor for Engineers
Graduated Magna Cum Laude

PUBLICATIONS

- I. Ngui, **C. McBeth**, G. He, A. Santos, L. Soares, M. Morales, N. M. Amato, “Extended Reality System for Robotic Learning from Human Demonstration,” arXiv: 2409.12862. (*Under review*)
- **C. McBeth**, J. Motes, I. Ngui, M. Morales, N. M. Amato, “Scalable Multi-Robot Motion Planning Using Guidance-Informed Hypergraphs,” arXiv: 2311.10176. (*Under review*)
- A. Attali, S. Ashur, I. B. Love, **C. McBeth**, J. Motes, M. Morales, N. M. Amato, “A Framework for Guided Motion Planning,” arXiv: 2404.03133.
- R. Moan, **C. McBeth**, M. Morales, N. M. Amato, K. Hauser, “Experience-based Multi-agent Pathfinding with Narrow Corridors,” in Proceedings of Robotics: Science and Systems, 2024.
- **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. (*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**, I. Ngui, G. He, A. Santos, L. Soares, M. Morales, and N. M. Amato, “XR-Based System for Demonstration Collection in Human-Robot Interaction”, Poster presented at: IEEE International Conference on Robotics and Automation 40th Anniversary Celebration; September 23, 2024; Rotterdam, Netherlands.

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- **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, Michigan, USA.
 - **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, California, USA.

RESEARCH AND PROFESSIONAL EXPERIENCE

University of Illinois Urbana-Champaign, Parasol Lab

Research Assistant

August 2021 - Present

- Design systems to enable robots to efficiently adapt their motion to align with human preferences.
- 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

University of Illinois Urbana-Champaign*Graduate Teaching Assistant, CS 441 Applied Machine Learning, Fall 2024*

- Assisted in developing new course material on recent machine learning methods.
- Held office hours and monitored asynchronous discussion board.

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 and graded lab work, projects, and exams.

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

- Supervised the undergraduate teaching consultants.
- Designed and wrote the final project assignment.
- Held office hours and 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

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