COURTNEY MCBETH

(727) 238-2465 • cmcbeth2@illinois.edu
https://courtneymcbeth.com/
2504 Fields South Dr Apt 305, Champaign, IL 61822

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

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

PEER-REVIEWED PUBLICATIONS

- I. Ngui, **C. McBeth,** A. Santos, G. He, K. J. Mimnaugh, J. D. Motes, L. Soares, M. Morales, N. M. Amato, "ERUPT: An Open Toolkit for Interfacing with Motion Planners in Extended Reality," arXiv: 2510.02464. (*Accepted to ICAT 2026*)

- I. Ngui*, **C. McBeth*,** J. D. Motes, M. Morales, N. M. Amato, "Scalable Multi-robot Motion Planning via Hierarchical Subproblem Expansion and Workspace Decomposition Refinement," arXiv: 2605.20395. (*Accepted to WAFR 2026*)

- **C. McBeth**, J. D. Motes, I. Ngui, M. Morales and N. M. Amato, "Scalable Multi-Robot Motion Planning Using Workspace Guidance-Informed Hypergraphs," in *IEEE Robotics and Automation Letters*, vol. 11, no. 4, pp. 4929-4936, April 2026, doi: 10.1109/LRA.2026.3666398.

- 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*, Delft, Netherlands, 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*)

WORKSHOPS AND POSTER PRESENTATIONS

- I. Ngui, **C. McBeth**, G. He, A. Santos, L. Soares, M. Morales, and N. M. Amato, "Extended Reality System for Robotic Learning from Human Demonstration", Poster presented at: *IEEE Conference on Virtual Reality and 3D User Interfaces*; March 11, 2025; Saint Malo, France.

- **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 (ICRA) 40th Anniversary Celebration*; September 23, 2024; Rotterdam, Netherlands.

- **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.

- 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.

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.

Jabil 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, Fall 2025

- 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.

TECHNICAL KNOWLEDGE

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