# Maria Clare Lusardi

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## Education

**University of Illinois** — Champaign-Urbana, Illinois
PhD in Computer Science — *Aug 2023 – May 2028 (Anticipated)*
*Thesis Focus: Informative Robot Path Planning for Enhanced Human-Robot Collaboration.*

**University of Missouri** — Columbia, Missouri
BS in Computer Science, GPA:4.0 — *Aug 2019 – May 2023*

## Publications

**In Submission**

John Pohovey, **Maria Lusardi**, Aamir Hasan, Shuijing Liu, Andre Schreiber, Samuel Olatunji, Wendy A. Rogers, Katherine Driggs-Campbell. "Beyond Canes and Guide Dogs: The Status of Robotic Solutions for Wayfinding, Navigating, and Orienting the Visually Impaired." (2025). *Open Engineering Inc. preprint, 10.31224/4985.*

- In submission for ACM Transactions on Human-Robot Interaction (T-HRI).

**Published**

Ananya Yammanuru, **Maria Lusardi**, Nancy M. Amato, Katherine Driggs-Campbell. "From Legible to Inscrutable Trajectories:(Il) legible Motion Planning Accounting for Multiple Observers". (2026). *arXiv preprint arXiv:2602.09227*.

- Accepted to the Workshop on the Algorithmic Foundations of Robotics (WAFR) in 2026.

**Maria Lusardi**, Mimi Trinh, Jude Chinyere Okoro, Yao-Lin Tsai, John Pohovey, Anjali Ramesh, Samuel Olatunji, Wendy Rogers, Katherine Driggs-Campbell. "Potential for Robots to Assist People with Vision Impairments with Orientation and Mobility." (2025).

- Presented at Human Factors and Ergonomics in Health Care International Symposium (HFES) in 2025.

Stav Ashur, **Maria Lusardi**, Marta Markowicz, James Motes, Marco Morales, Sariel Har-Peled, and Nancy M. Amato. "SPITE: Simple Polyhedral Intersection Techniques for modified Environments." (2024).

- Presented at the 40th Anniversary of the IEEE International Conference on Robotics and Automation (ICRA@40) in 2024.
- Presented at the Workshop on the Algorithmic Foundations of Robotics (WAFR) in 2024.

Har-Peled, Sariel, and **Maria C. Lusardi**. "Dependable Spanners via Unreliable Edges." (2024). *arXiv preprint arXiv:2407.01466.*

**Lusardi, Maria Clare**, Isaac Dubovoy, and Jeremy Straub. "Determining the Impact of Cybersecurity Failures During and Attributable to Pandemics and Other Emergency Situations."(2020). In *2020 IEEE Applied Imagery Pattern Recognition Workshop (AIPR)* (pp. 1-6). IEEE.

- Presented in the IEEE Applied Imagery Pattern Recognition Workshop (AIPR) in 2020.

## Research Projects

**Air Force Research Laboratories Autonomous Vehicles Lab** — Eglin AFB, Fort Walton Beach, Florida
Research Intern — *May 2025 – Aug 2025*

- Investigating how knowledge of other agents' intent impacts the performance of hierarchical reinforcement learning (HRL) by implementing HRL in a cooperative/adversarial environment using the PyQuaticus Capture-the-Flag simulation and Ray RLlib.

**DUBIOUS Path Planning** Champaign-Urbana, Illinois
Graduate Research Assistant *Aug 2025 – Present*

- Defined the problem of conveying intent through motion planning in environments with observers of Mixed Motive and Limited-Observability (MMLO-LMP), which can be applied in military, assistive, and entertainment contexts.
- Developed an algorithm to solve the MMLO-LMP problem, the DUal BIased limited Observability Unified trajectory Solver (DUBIOUS), and evaluated on environments with multiple observers of conflicting motives and overlapping visibility regions. Verified that DUBIOUS outperforms baseline legibility and decoy legibility methods.

**Wayfinding Assistant: WayBot** Champaign-Urbana, Illinois
Graduate Research Assistant *Jan 2024 – Present*

- Analyzing the impact of path planning on the ability of People with Visual Impairments (PwVI) to cognitively map an unfamiliar environment when being guided by a robot by designing a user study with the Stretch Robot from Hello Robot in a home simulation environment.
- Investigating vibrotactile haptic effects to communicate spatial information to (PwVI) using a custom 3D printed handle with embedded vibrotactile motors from Titan Haptics attached to the Stretch Robot.
- Determined key features necessary for an orientation and mobility assistive device for PwVI by conducting and analyzing interviews of orientation and mobility specialists.
- Identifying strengths and limitations of current research into robotic assistive devices for PwVI by co-authoring a literature review of research on the topic from 1984 to the present.
- Expanded participation in assistive device research by mentoring two undergraduates for a summer in developing features to integrate the Stretch robot with a vibrotactile handle.

**SPITE Dynamic Roadmaps** Champaign-Urbana, Illinois
Graduate Research Assistant *Oct 2023 – Oct 2024*

- Validated the SPITE dynamic roadmap update method by creating and running experiments against existing roadmap update methods and single query methods.
- Improved availability of dynamic roadmap update methods by assisting with implementation of the SPITE algorithm into the Parasol Planning Library.
- Demonstrated real-world feasibility by implementing trajectories planned in simulation on a 6 Degrees of Freedom UR5e manipulator robot.
- Disseminated this work by presenting a poster at the IEEE International Conference on Robotics and Automation (ICRA@40) in 2024.

**Bio-Informatics in Plant Science** Columbia, Missouri
Undergraduate Research Fellow *Aug 2020 – May 2021*

- Evaluated pH sensors suitable for plant-science experiments by analyzing the consistency of readings from several different sensor brands using RShiny.
- Obtained more complete data from pH monitoring experiments by creating a system for autonomous recording of pH data with a Raspberry Pi.
- Streamlined the setup of plant-science experiments by providing thorough sensor documentation for non-specialists.
- Presented research at the Undergraduate Research Forum in written, poster, and video formats and won Best Abstract in spring 2021.

**Cybersecurity Research Experience for Undergraduates** Fargo, North Dakota
Undergraduate Research Fellow *Jun 2020 – Aug 2020*

- Predicted the cyber-attacks a network would face in a pandemic by identifying factors affecting the rate of cyberattacks and modeling how they would change based on pandemic conditions by creating a simulator system using C.
- Authored a research paper, *Determining the Impact of Cybersecurity Failures During and Attributable to Pandemics and other Emergency Situations,* and presented it at the 2020 IEEE AIPR conference.

## Teaching/Leadership

**University of Illinois Siebel School of Computing** Champaign-Urbana, Illinois
CS 498 Robotics Projects: Teaching Assistant *Aug 2024-May 2025*

- Created and delivered lectures and active learning exercises related to robotics topics such as PID control, reward design for reinforcement learning, and sampling-based motion planning.
- Assisted students in learning how to deploy code on the Booster K1 humanoid.
- Assisted in developing assignments involving reinforcement learning training on shared cluster resources.

**Break Through Tech** Champaign-Urbana, Illinois
Course Assistant *May 2026 – Aug 2026*

- Assisted lab facilitators in running virtual lab sections by monitoring the chat, attending to individual student questions, and encouraging engagement and deeper participation
- Provided grading and feedback to students

**University of Illinois Siebel School of Computing** Champaign-Urbana, Illinois
CS 341 Systems Programming: Teaching Assistant *Aug 2024-May 2025*

- Supplemented a systems programming class by giving short lectures and providing one-on-one programming assistance in weekly labs.
- Collaborated on developing course content for labs and implementing active learning strategies.
- Assisted with maintenance of course infrastructure by developing Docker containers for components of the website and automatic grader.

**University of Missouri Department of Computer Science** Columbia, Missouri
Peer Learning Assistant *Aug 2021-Dec 2021*

- Facilitated an entry-level programming course by grading assignments and providing feedback for 45 students.
- Promoted independent problem solving by providing one-on-one assistance to students in weekly office hours.

**Student Underwater Robotics Foundation** Columbia, Missouri
Co-President *Apr 2020 – May 2023*

- Led the software team to develop an autonomous submarine which qualified at the 2022 RoboSub competition using ROS, Python, and C/C++.
- Assisted with recruitment and increased foundation membership from 3 to 24 by making connections with other student clubs and speaking at freshmen level classes.
- Disseminated technical descriptions of the submarine and submitted to the 2020 and 2021 RoboSub competitions in paper and video formats.

## Work

**Air Force Research Laboratories Autonomous Vehicles Lab** Eglin AFB, Fort Walton Beach, Florida
Research Intern *May 2025 – Aug 2025*

- Investigating how knowledge of other agents' intent impacts the performance of hierarchical reinforcement learning (HRL) by implementing HRL in a cooperative/adversarial environment using the PyQuaticus Capture-the-Flag simulation and Ray RLlib.

**CrowdStrike** Minneapolis, Minnesota
Software Engineering Intern *June 2022-Aug 2022*

- Enabled further insight into Windows Defender tampering by investigating the impact of manipulating system environment variables and programming detection logic as a component of the CrowdStrike Falcon Sensor.

**Caterpillar** Peoria, Illinois
Engineering Intern *May 2021-Aug 2021*

- Researched the impact of sensor specifications on error in inertial measurement units (IMU) by simulating the effect of four kinds of stochastic and deterministic error using equations for Gauss-Markov noise and Kalman Filters in MATLAB

## Academic Honors and Awards

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| NSF GRFP Honorable Mention | *Apr 2025* |
| College of Engineering High Dean's List | *Dec 2019 – May 2023* |
| Outstanding Award for Abstract Writing | *Apr 2021* |
| Mark Twain Scholarship | *Aug 2019 – May 2023* |
| Discovery Fellows | *Aug 2020 – May 2021* |