

APARAJITO SAHA

rajsaha@umich.edu — LinkedIn — Portfolio

RESEARCH INTERESTS

3D perception & scene understanding, instruction-following mobile manipulation, reinforcement learning for skill coordination

EDUCATION

Ph.D. Robotics (Incoming), University of Michigan, Ann Arbor
Advisor: Dr. Bernadette Bucher

Ann Arbor, MI, USA
Aug 2026 — Exp. May 2030

M.S. Robotics, University of Michigan, Ann Arbor
Cumulative GPA: 4.00/4.00

Ann Arbor, MI, USA
Aug 2024 — Exp. May 2026

Relevant Courses: Advanced Computer Vision, 3D Robot Perception, Online Learning for Control, Computational Human-Robot Interaction

B.S. Electrical & Computer Engineering + Computer Science, Cornell University
Cumulative GPA (double major): 3.74/4.00

Ithaca, NY, USA
Aug 2018 — May 2022

Honors: Cum Laude, Departmental Honors in Computer Science, Dean's List

RESEARCH EXPERIENCE

Graduate Student Research Assistant, Mapping & Motion Lab
Principal Investigator: Dr. Bernadette Bucher

University of Michigan
Dec 2024 — Present

- Formulated the *interactive object search* problem, in which a mobile manipulator must reason about necessary physical interactions with an unexplored indoor environment to eliminate occlusions, identify visual affordances and locate semantically-defined target objects
- Designed a robotic task benchmark for the interactive object search problem to evaluate geometric and semantic reasoning for high-level planning alongside fine-grained control capabilities for mobile manipulator systems
- Led implementation efforts for a photorealistic, physics-driven extension on Nvidia's IsaacSim platform that leverages procedural generation and 3D asset population for creating multi-room indoor scenes for interactive object search
- Advised a team of graduate and undergraduate students for deploying state-of-the-art perception and manipulation systems such as MAST3R-SLAM, RoboPoint and AnyGrasp on a Boston Dynamics Spot quadruped robot, with the objective of producing an open-source software stack for instruction-following mobile manipulation
- Developed a method to add object-map alignment to visual-semantic frontier mapping, providing robust localization and open-set object goal navigation capabilities

Undergraduate Research Assistant, EmPRISE Lab
Principal Investigator: Dr. Tapomayukh Bhattacharjee

Cornell University
Aug 2021 — May 2022

- Engineered a prototype circuit board for managing real-time communication of tactile feedback from a whole-arm fabric skin sensor system, earning an acknowledgment for the contribution in B. Xu et. al. "CushSense: Soft, Stretchable, and Comfortable Tactile Sensing Skin for Physical Human-Robot Interaction" *International Conference on Robotics & Automation, 2024*

PROFESSIONAL EXPERIENCE

Software Development Engineer, Amazon Fulfillment Technologies & Robotics
Manager: Todd Clemetson

North Reading, MA, USA
Jul 2022 — Aug 2024

- Designed autonomous robotic movement solutions deployed to over 1 million mobile robotic drive units in Amazon's global warehouse network
- Led a zero-downtime serverless rearchitecture and migration effort for a critical production service responsible for computing and updating unavailable resources on warehouse floors
- Contributed to algorithms for storage and retrieval optimization used in Amazon's new Sequoia fulfillment centers, reducing delivery miss rates
- Developed a continuous improvement and deployment pipeline framework for the robotic movement team, leading to a 2 hour reduction in downtime and maintenance per service per week across 8 Tier-1 and Tier-2 services
- Participated in on-call rotations to resolve high-severity events, mentored interns and new engineers on engineering practices and projects, and held open office hours for operations managers to troubleshoot floor issues

PUBLICATIONS

Preprints

- **A. Saha**, Z.H. Gan, J. Guo, J. Skwirsk, A. Arapin, J. Acheampong, S. Shaik, C. Ku, Y. Hu, N. Fazeli, B. Bucher. “Mobile InterAct: Benchmarking Interactive Semantic Object Search on a Mobile Manipulator” (*in-progress*)

Technical Reports

- A. Khurana*, K. Ranjan*, **A. Saha***. “AroundSound: Digital Echolocation for the Visually Impaired.” *CircuitCellar Issue 386, Sept. 2022* (* denotes equal contribution)

TEACHING

Graduate Student Instructor, University of Michigan, Ann Arbor *Ann Arbor, MI, USA*
EECS 442: Computer Vision (*240 students/ semester*) *Aug 2025 — Dec 2025*

Teaching Assistant, Cornell University *Ithaca, NY, USA*
ECE 5725: Design with Embedded Operating Systems (*80 students/ semester*) *Aug 2021 — May 2022*

Peer Advisor, Cornell University *Ithaca, NY, USA*
ENGRG 1050: Engineering Seminar (*25 students/ semester*) *Aug 2021 — May 2022*

MENTORSHIP

University of Michigan, Ann Arbor

- Jinjia Guo, M.S. Robotics *Sept 2025 — Dec 2025*
- Kornvik Tanpipat, M.S. Robotics *Sept 2025 — Dec 2025*
- Saumit Vedula, M.S. Robotics *Sept 2025 — Dec 2025*
- Aileen Yan, M.S. Electrical & Computer Engineering *Sept 2025 — Dec 2025*
- Chenrui Gao, B.S. Computer Science & Engineering *Sept 2025 — Dec 2025*
- Georgia Zender, B.S. Computer Science & Engineering *Feb 2025 — May 2025*

Amazon Fulfillment Technologies & Robotics

- Hemant Palavali, Software Development Engineer *December 2023 — March 2024*

Cornell University

- Cornell Cup Robotics Team (20+ students) *Aug 2021 — May 2022*

SKILLS

Programming Languages: Python, C++, Java, MATLAB

Software: IsaacSim, PyTorch, ROS2, Slurm, Git, Docker, AWS Lambda, AWS DynamoDB

Hardware: NVIDIA Jetson, Raspberry Pi, Rapid Prototyping (3D Printing, Soldering, Circuit Board Design)