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Michael Ibrahim

Education

2026 **MS, Computer Science and Engineering**, *University of Washington*, Seattle, WA, *4.0/4.0*

2025 **BS, Computer Science**, *University of Washington*, Seattle, WA, *3.8/4.0*

2025 **BS, Informatics**, *University of Washington*, Seattle, WA, *3.8/4.0*

2022 **AS, Engineering**, *Cascadia College*, Bothell, WA, *3.9/4.0*

Master thesis

title *Closed-Loop Vision Inference and Control on Insect-Scale Robotics*

supervisors Vikram Iyer

description This thesis describes a low-power vision-in-the-loop autonomy framework for the one-centimeter MilliMobile robot. The system integrates onboard image sensing, embedded inference, Bluetooth communication, and closed-loop navigation, and uses measured energy and timing costs to evaluate trade-offs across perception, locomotion, communication, and power use

Experience

Research & Industry

June 2023–June 2026 **Research Assistant**, *Iyer Lab, University of Washington*, Seattle, WA
Advisor: Vikram Iyer.
Conducted research in embedded vision systems, robotics, and edge machine learning, focusing on ultra-low-power and battery-free imaging for resource-constrained platforms.
Detailed achievements:

- Designed and integrated low-power camera systems for continuous vision on resource-constrained platforms.
- Developed and deployed TinyML models in TensorFlow for real-time object classification and motion tracking.
- Optimized on-device inference and image processing to improve responsiveness.
- Implemented microcontroller-based control algorithms to enable precise actuation while minimizing power consumption.
- Demonstrated scalable approaches to vision-driven control in autonomous systems.

June 2025–September 2025 **Software Development Engineer Intern**, *Amazon*, Seattle, WA

Designed and implemented scalable software systems for job application tracking using TypeScript, React, AWS CDK, and DynamoDB.

Detailed achievements:

- Designed and implemented a scalable job application count system using **TypeScript** and **React**.
- Integrated AWS CDK for infrastructure-as-code provisioning and DynamoDB for data storage with millisecond response times.
- Developed a modular TypeScript service layer to interface with DynamoDB, encapsulating business logic for incrementing, retrieving, and managing job counters.
- Achieved **99.99%** reliability and **100%** test coverage.
- Ensured compatibility with existing React infrastructure by reusing shared authentication and logging components.
- Integrated features into Yarn builds, CI/CD pipelines, and monitoring systems.

June 2023–March 2025 **Undergraduate Research Assistant**, *Autonomous Insect Robotics Lab, University of Washington*, Seattle, WA

Advisor: Sawyer Fuller.

Performed experimental analysis of propeller dynamics to characterize damping behavior and support data-driven evaluation of vibrational performance.

Detailed achievements:

- Used load cell measurements to capture force response data under oscillatory conditions.
- Developed a Python-based tool for real-time data visualization and quantitative extraction of damping parameters.
- Applied the analysis framework to compare propeller designs.
- Advanced understanding of passive damping mechanisms in rotating systems.

June 2024–August 2024 **Software Engineer Intern**, *Boeing*, Kent, WA

Developed and maintained software interfaces for embedded systems, focusing on user interaction, backend integration, and system reliability.

Detailed achievements:

- Developed and maintained dynamic user interfaces for embedded systems using PHP and JavaScript.
- Enhanced user interaction and control over hardware functionalities.
- Collaborated with cross-functional teams to design and implement RESTful APIs.
- Enabled seamless integration between PHP backend services and JavaScript front-end components.
- Conducted end-to-end testing of interfaces with embedded networking components.
- Ensured robust data exchange and reliable system performance across various hardware configurations.

Teaching

September 2023–June 2026 **Teaching Assistant**, *Paul G. Allen School of Computer Science & Engineering*, Seattle, WA

Courses: CSE 374: Intermediate Programming Concepts and Tools, CSE 461: Introduction to Computer Communication Networks, CSE 462: Wireless Communication, and CSE 480: Computer Ethics.

Supported instruction across computer networks, wireless communication, and computer ethics through discussion sections, labs, office hours, project mentoring, and assignment feedback.

Mentorship & Leadership

September 2024–Present **Founding Mentor**, *Rawan Mentorship*, Seattle, WA
Provided mentorship to high school students in the Uyghur diaspora, supporting academic growth, college preparation, and STEM development.

September 2024–June 2025 **Recruitment Representative**, *Paul G. Allen School of Computer Science & Engineering*, Seattle, WA
Led admissions outreach and recruitment efforts to support prospective students and strengthen access to computing education.

August 2024–June 2025 **Scholar Lead & Mentor**, *Washington State Opportunity Scholarship Foundation*, Seattle, WA
Mentored first-generation and low-income students through academic support, career guidance, and college navigation programming.

June 2023–June 2025 **Treasurer**, *Tau Beta Pi Engineering Honor Society, Washington Alpha Chapter*, Seattle, WA
Managed chapter finances, supported event and scholarship funding, and coordinated with society leadership to strengthen chapter operations.

June 2023–June 2024 **Allen School Ambassador**, *Paul G. Allen School of Computer Science & Engineering*, Seattle, WA
Represented the Allen School through outreach presentations, student panels, and programming designed to broaden participation in computing.

September 2022–September 2023 **Teacher, Outreach Mentor**, *AVELA – A Vision for Engineering Access & Literacy*, Seattle, WA
Designed and delivered interactive STEM lessons and outreach programs for diverse K–14 student populations.

Grants & Funding

2024 – 2025 Washington NASA Space Grant Consortium *$11,500*

Awards, Scholarships, & Fellowships

2024 Tau Beta Pi Engineering Honor Society Scholar
2024 CMD-IT/ACM Richard Tapia Conference Scholar
2024 Qualcomm QSA Delegate
2023 Allen Scholarship Awardee
2022 Washington State Opportunity Scholar

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