James P. Walsh

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EDUCATION

Northeastern University - Boston, MA **Dec 2027**
Master of Science in Robotics; GPA: 3.67
Relevant Coursework: Mobile Robotics, Robotics Sensing and Navigation, Control Systems Engineering, Wearable Robotics

University of Massachusetts Lowell - Lowell, MA **May 2025**
Bachelor of Science in Computer Science, Minor in Mathematics; GPA: 3.7
Relevant Coursework: Foundations of Robotics, Statics, Dynamics, Physics I, Intro to Electrical and Computer Engineering

TECHNICAL SKILLS

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

Robotics/Sensors: ROS2 (nodes, topics, ros2 bag, custom messages), IMU, GNSS/GPS, RTK GNSS, PID/control, Simulink

Embedded/Hardware: Arduino, ESP32-S2, logic analyzer, oscilloscope, microcontrollers, serial comms, breadboard, soldering equipment, Allen Bradley PLCs / Light Curtain

Tools: Gitlab, Github, Jira, Linux/Ubuntu, NumPy, rclpy, SciPy, OpenCV, Matplotlib, scikit-learn, Visual Studio/VS Code, draw.io

Methodologies: Agile, Scrum, UML

TECHNICAL PROJECTS

Elbow Angle Estimation - Boston, MA (Team Project) **Fall 2025**
- Designed a wearable device that estimates the angle between someone's forearm and upper using two IMU sensors with sensor fusion.
- Built a quaternion-based angle estimation algorithm in Python with NumPy. The algorithm used IMU quaternion data to rotate a common bone axis into the world frame and compute the elbow angle from the dot product.
- Utilized the algorithm in a ROS2 node that subscribed to IMU topics and published real-time angle.

FlashCars - Educational Game - Lowell, MA (Team Project) **Fall 2024**
- Lead group project of four peers with the objective of creating an educational game for elementary students. The game provides students with a fun alternative way to learn.
- Created the game in C# using Unity where the player's car avatar moves along a track by answering multiple questions for a subject of their choice.
- The student's time is displayed so they can track their progress.
- Co-authored a comprehensive SRS document to define functional, non-functional, and technical requirements.

DuckieBot - Lowell, MA **Spring 2023**
- Mini 3-wheeled Robot programmed in Python using ROS.
- Implemented lane following using OpenCV image processing. The robot autonomously maintained lane boundaries for multiple different tracks (circle and square) with yellow dotted lines and solid white lines to represent a road.
- Tuned PID controller for stop-sign behavior and speed control by AprilTag recognition.

RELEVANT WORK EXPERIENCE

Firmware Engineer Co-op - Rockwell Automation - Chelmsford, MA **Jan 2024 - Aug 2024**
- Collaborated closely with firmware engineering team, focusing on long term project development and testing.
- Performed hands-on hardware testing/verification of anomalies found in firmware of product. Used testing equipment such as circuit boards, digital oscilloscopes, logic analyzers, and soldering equipment on microcontrollers to simulate real world applications of the product. Recorded qualitative and quantitative results during testing.
- Tasked with designing and developing a custom low-level analyzer for debugging serial communications between two on-board microcontrollers. Analyzer provides a detailed decomposition of the data from captured messages.

Academic Tutor - University of Massachusetts Lowell - Lowell, MA **Feb 2023 - May 2025**
- Tutor for programming in C/C++ and using Linux OS. Lead one-on-one and group tutoring sessions to revisit course topics.