Evan Kaba

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Education

Worcester Polytechnic Institute **Aug. 2023 – May 2027**

B.S. Robotics Engineering, Minor in Electrical and Computer Engineering (3.6 GPA, 4x Dean's List) *Worcester, MA*

Relevant Coursework

Optimal Control, SWE, Robotics I-IV, Operating Systems, RTOS, Technical Writing, Computer Architecture

Honors & Selective Programs

Selected Participant, Inaugural Stanford DroneHacks (1 of 100) *Upcoming: November 2026*

Work Experience

Aerial-Robot Control and Perception Lab (WPI) **March 2025 – Present**

Undergraduate Researcher *Worcester, MA*

- Developed behavior planning pipelines leveraging LLMs and VLMs for high-level decision making and aerial manipulation; evaluated closed-loop spatial reasoning and trajectory generation across simulation benchmarks (Isaac Sim/AM-Bench) and physical testbeds.
- Developed an autonomous flight stack for high-speed **(>10m/s)** quadrotor navigation, benchmarking event-to-depth neural networks against classical stereo vision under dynamic lighting and severe motion blur.
- Spearheaded migration from PX4 to Indiflight (research-grade Betaflight fork), deployed Incremental Nonlinear Dynamic Inversion (INDI) attitude controller to execute aggressive, high-bandwidth acrobatic trajectories.

Eventide Audio Inc. **Summer 2026**

Engineering Intern *Little Ferry, NJ*

- Evaluated a low cost audio analyzer solution for noise and emissions measurements, and wrote a python control interface for the existing automated testing suite.
- Overhauled RF Anechoic chamber, upgraded legacy testing hardware to LinuxCNC (Kernel with PREEMPT_RT Patch) and developed remote control (web page, REST API) and rich integration with the automated testing suite.
- Designed and built factory automation jigs for flagship rack-mount effects processors, minimizing damage during production and simplifying the assembly process.

PL Custom Emergency Vehicles, Co. **Summer 2023**

Engineering Intern *Manasquan, NJ*

- Reduced chassis frame assembly time by 6 hours and cut alignment defects by designing parametric manufacturing fixtures in SOLIDWORKS.
- Optimized large-scale CAD assembly performance by generating parametric low-detail configurations for high-complexity interior components.

Projects

LUMA Biome Digital Platform | *Systems Architecture, Requirements Engineering, Figma* **Spring 2026**

- Designed system architecture and interactive proof-of-concept for an environmental monitoring platform, structuring nodal data ingestion pipelines (Record → Refine → Report) for multi-source IoT sensor streams.

Autonomous SLAM Mobile Robot | *Python, ROS1 Noetic, Gazebo, OpenCV, Robotis Turtlebot3* **March 2025**

- Integrated and tuned an end-to-end 2D LiDAR navigation and localization pipeline on a TurtleBot3 using AMCL and Gmapping.
- Tuned AMCL particle distribution, sensor model beam dynamics, and update thresholds to eliminate localization drift under noisy 2D planar LiDAR returns.
- Configured dynamic 2D costmap inflation layers and recovery behaviors to prevent trajectory oscillation and bridge sim-to-real navigation gaps.

Robotic Arm | *MATLAB, Computer Vision Toolbox, OpenMANIPULATOR-X* **January 2025**

- Implemented closed-loop color sorting on a 4-DOF manipulator by mapping camera-frame 2D object detections to 3D Cartesian coordinates via calibrated intrinsic transformation matrices.
- Derived forward and inverse kinematics using Denavit-Hartenberg (DH) parameters and resolved-rate Jacobian control, tracking smooth trajectories from a quintic polynomial generator.

Technical Skills

Languages: Python, C, C++, Bash, MATLAB, Java
Developer Tools: Git, CMake, Docker/Singularity, GDB, VSCode, Pytest, Catch2
Technologies/Frameworks: Linux PREEMPT_RT, PX4 Autopilot, NVIDIA JetPack, ROS 1/2, FreeRTOS, SOLIDWORKS, Eigen, OpenCV, NumPy
Hardware: NVIDIA Jetson Orin NX/Embedded Linux, Logic Analyzers, Oscilloscopes, UART, CAN, I2C, SPI, RealSense D455, Prophesee/Metavision Event Cameras