

Aidan Hallberg

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EDUCATION

University of Michigan

Bachelor of Science in Mechanical Engineering; Minor in Computer Science

- GPA: 3.92; Dean's Honor List (4 semesters)

Ann Arbor, MI

Expected May 2028

EXPERIENCE

Toyota Research Institute of North America / University of Michigan

Research Assistant, Continuum Robot Project

May 2026 – Present

Ann Arbor, MI

- Developed custom 6-DOF sensing and kinematic reconstruction operating at 115 Hz, with angular estimates within $\pm 1^\circ$ of visual tracking.
- Designed a custom 38-component multi-board PCB, reducing packaging footprint by 10% while integrating the complete sensing system and improved pneumatic/electrical routing.
- Redesigned embedded C++ closed-loop control for pneumatic actuation, holding commanded angles within $\pm 1^\circ$ under load for Toyota motion-planning integration.

Smart Materials & Structures Design Lab – University of Michigan

Undergraduate Researcher, U.S. Air Force-Sponsored Project

Dec 2025 – May 2026

Ann Arbor, MI

- Designed and fabricated a reconfigurable morphing-wing test article with interchangeable ligature layouts and adjustable spring preload.
- Developed a matrix-based analytical model predicting failure loads and moments for any ligature configuration and spring preload.
- Validated the model across four axial/torsional loading modes, correctly predicting free versus constrained motion and failure thresholds with 12% mean error; demonstrated ligature-driven twist morphing.

Tactix Mobility Solutions

Engineering Intern

Jun 2025 – Aug 2025

Remote

- Built a component traceability database and supplier-linked part callouts for 2025 RAM 3500 steering, suspension, and camera systems, supporting autonomy integration.

PROJECTS

Caliber (Smart Nutrition Scale) | C++, ESP32, KiCad, AWS IoT, MQTT, React Native

2025 – Present

- Designed and fabricated a manufacturing-ready smart nutrition scale with a custom multi-board PCB; sourced components and negotiated with suppliers to reduce BOM cost.
- Implemented load-cell sensing, barcode scanning, and C++ firmware on ESP32, integrating the device and React Native app through an AWS cloud backend using IoT/MQTT.

FlightSwap (Pilot Trip-Trading Platform) | TypeScript, Next.js, React Native, Firebase, RAG

2025 – 2026

- Built a full-stack trip-trading platform integrating real-time flight data, Firebase, and a RAG-based engine to recommend trades based on pilot preferences.

Commitd (Social Accountability App) | TypeScript, React Native, Expo, Firebase

2024 – 2025

- Led a 10-month development cycle from user research through beta launch, building goal tracking, social progress sharing, and streak-based engagement.

TECHNICAL SKILLS

Embedded/Hardware: PCB Design, KiCad, Arduino, ESP32, Oscilloscope, 3D Printing

Programming/Tools: C/C++, Python, MATLAB, Git, Excel

CAD/Manufacturing: SolidWorks, Siemens NX, GD&T, Mill, Lathe

Organizations: V1 @ Michigan: Operations Team Member; Product Studio Fall 2025 Cohort