

RICHARD HO

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EDUCATION

University of Michigan

Bachelor of Science in Engineering, Electrical Engineering, Minor in Physics

Ann Arbor, MI

GPA: 3.73 / 4.00

Expected May 2027

Coursework: Quantum Computing, Semiconductor Devices, Analog Circuits, Optics, Antennas and Wireless Systems, Electromagnetics, Signals and Systems, Logic Design, Computer Organization, Modern Physics

EXPERIENCE

Intelligent Robotics and Autonomy Lab, University of Michigan

Ann Arbor, MI

Research Assistant

May 2025 – Present

- Tuned quadrotor PID controllers, reducing drift by 99% to maintain stable flight across multiple orientations
- Assembled 3-axis gimbal testbed to facilitate over 100 safe flight simulations, enabling safe data collection
- Implemented autonomous trajectories in Python and ROS, utilizing Gazebo simulations

Michigan Aeronautical Science Association Project Team, University of Michigan

Ann Arbor, MI

Avionics Hardware Project Lead

Sep 2024 – Present

- Spearheaded component trade study and LTspice simulation for a 32-channel analog sensor emulation board, achieving 0.01 mV resolution to validate rocket avionics via hardware-in-the-loop testing
- Designed ‘Limelive’ flight video recorder schematics within a 5-person team, integrating a 720x480 camera, 9-bit ADC, and H.264 compressor to enable real-time 5.8GHz transmission and onboard logging

Computational Net Zero Lab, University of Michigan

Ann Arbor, MI

Research Assistant

Jan 2025 – May 2025

- Implemented the variational quantum eigensolver algorithm in Python for estimating molecular ground state energy
- Wrote a report analyzing algorithm performance, comparing error rates and convergence times across different molecules

Beaver Works Summer Institute, MIT

Cambridge, MA

Build a CubeSat Project Team Member

July 2023 – Aug 2023

- Collaborated in a 5-person team to design and prototype a 2U CubeSat, with attitude determination, power, communication, and imaging subsystems

PROJECTS

FPGA Four-Function Calculator | Verilog, ModelSim, FPGAs

- Designed a finite state machine to control the datapath for operations on multi-digit binary inputs
- Synthesized the design on an Altera FPGA board, interfacing with switches and buttons for user input and multiple 7-segment displays and LED light indicators to show operands and results
- Verified the design with a testbench in ModelSim, handling edge cases (division by zero, overflow)

Imaging CubeSat | Python, OpenCV

- Wrote a Python script to integrate an inertial measurement system for precise real-time attitude determination
- Designed an image processing pipeline in OpenCV that autonomously captured and images to detect ground-based LED lights in night conditions and collect data on color, brightness, and quantity

Rescue Robot | C++, Arduino

- Designed and built a robot with a thermistor-based heat sensing system for search-and-rescue applications
- Implemented motor control and sonar sensors in C++ on an Arduino for navigation and obstacle avoidance

Marquee LED Display Driver | C++, FreeRTOS, Embedded Systems

- Implemented a fully-customizable scrolling text display LED matrix using an ESP32 microcontroller
- Created an interface with a Java robot control system to control the display over SPI

SKILLS

Programming: C/C++, Python, Java, MATLAB, Verilog, ROS, Git, Linux, Qiskit, Pennylane

Professional Software: Altium Designer, LTspice, Quartus, ModelSim

Hardware: Arduinos, ESP-32, FPGAs, Oscilloscopes, Vector Network Analyzers