Ethan Greenhouse

(224) 406-4701 | greenhouse.e@northeastern.edu | ethangreenhouse.com

EDUCATION

Northeastern University - Boston, MA — Expected May 2028

Bachelor of Science in Electrical Engineering — GPA: 3.8

EXPERIENCE

Quality Engineer Co-op - AvtechTyee — Jan 2026 - Present

- Deployed Keyence machine vision system for PCA receiving inspection across 25+ unique boards, authoring Oracle Agile PLM work instructions to standardize defect detection, with estimated $100K annual savings
- Built hybrid rules-plus-ML supplier risk scoring system in Python with walk-forward backtesting on 7+ years of NCR data, achieving 1.63x top 5% lift over baseline
- Packaged risk scoring system as self-contained executable with Excel dashboard, now piloted by Supplier QE team for monthly review of 150+ active suppliers

PROJECTS

E-Ink Weather Station — Mar 2026 - Present

- Designed 2-layer ESP32-WROOM-32 PCB in KiCad to drive a Waveshare 4.2" e-paper display with live weather data over WiFi
- Integrated TP4056 and AMS1117-3.3 into a complete power path from USB-C input to regulated 3.3V MCU supply
- Routed dual-layer SPI signals through ESP32 antenna keep-out zone with ground plane exclusion to maintain RF performance

12V to 5V Buck Converter — Feb 2026

- Designed 2-layer power supply PCB in KiCad with LM2596 buck regulator, achieving 85-95% conversion efficiency at 3A output
- Implemented step-down topology with flyback diode and LC filtering for stable voltage regulation

Hexapod Spider Robot — Nov 2025 - Dec 2025

- Programmed servo motor control in C++ on a DE0-Nano SoC using memory-mapped I/O to drive 18 PWM channels across a 6-legged robot
- Developed tripod gait sequencing algorithms for forward, backward, and turning, achieving stable walking motion

ECG Signal Processing System — Nov 2025 - Dec 2025

- Characterized AD627 instrumentation amplifier, achieving 70.5 dB CMRR against an 80-85 dB theoretical benchmark
- Designed cascaded analog filters (0.1 Hz HPF, 160 Hz LPF) to isolate ECG passband and prevent aliasing
- Extracted heart rate via MATLAB peak detection across 5 test conditions using NI USB-6001 ADC

Rocket Avionics Firmware — Sept 2025 - Nov 2025

- Developed embedded C++ firmware for rocket flight control and data acquisition on a custom PCB
- Established I2C IMU driver to capture inertial flight data for filtering and post-flight analysis
- Implemented SPI FLASH memory driver incorporating filtering algorithms and event detection logic to identify flight phases

Laser Maze Game - sites.google.com/view/lasermaze/home — Jan 2025 - April 2025

- Spearheaded an interactive laser-based puzzle game for Boston Children's Museum, serving 100+ visitors
- Designed 3D-printed mirror stands in SolidWorks with magnetic snap bases to guide mirror placement for young visitors
- Built modular AutoCAD enclosure to contain the laser path, house electronics, and enable quick assembly
- Programmed Arduino microcontroller in C++ to detect photoresistor sensor input with <100ms response time, resolving ambient light interference through calibrated threshold detection system

SKILLS

Programming: C++, MATLAB, Python, HTML/CSS, Bash

Software: KiCad, LTspice, Quartus Prime, SolidWorks, AutoCAD, Git, Linux, Power BI, Oracle Agile PLM

Hardware: Oscilloscope, Multimeter, Bench Power Supply, Soldering, 3D Printing, Laser Cutting, I2C, SPI, PWM