

ANTHONY HAMAMJI

☎ 508-654-3734

✉ hamamjianthony@gmail.com

in linkedin.com/in/anthonyhamamji

🔗 [Portfolio](#)

Education

University of Colorado Boulder

Master of Science Electrical Engineering

Expected May 2027

University of Colorado Boulder

Bachelor of Science Electrical Engineering

Minor in Energy Engineering

Aug 2022 – May 2026

Major GPA: 3.5

Skills

- Programs: C++, C, Python, Embedded C, System Verilog, MATLAB, Latex
- Developer Tools: Ansys HFSS, Ansys Electronics Desktop, Keysight ADS, Siemen's Hyperlynx, Seasim, SIMetrix, LTSpice, Altium, Cadence Allegro, Autodesk Fusion, STM32Cube, PlatformIO, WaveForms, VScode, Oscilloscopes, VNA/TDR, Bode 100, Reflow, Pick-and-Place
- Relevant Coursework: Electronic Design Lab, PCB Design and Manufacturing, Power Electronics, Analog IC Design, High Speed Digital Design, Microelectronics, Electromagnetic Fields and Waves, Embedded Software Engineering

Experience

EO Solutions

Jun 2026 – Jul 2026

Electrical Engineering Intern

Las Vegas, NV

- Restored dry-run protection on a production 3-phase tumbler after the existing interlock failed, deploying a two-relay fail-safe that gates an Allen-Bradley 509-BOD starter on proven lube oil flow; sized contacts against inductive break ratings and delivered schematics with a documented sequence of operation
- Cleared the path to embed Teensy 4.1 circuitry directly into future PCB designs by booting its Arduino core on an i.MX RT1062 from external QSPI flash without the proprietary MKL02 controller, validating GPIO, PWM, UART, and USB serial across 14 tests
- Confirmed 9 kHz bandwidth on a redesigned fast steering mirror (FSM) control board in Altium, replacing cascaded LDOs with an LT8609S buck stage and adding a CAN transceiver
- Cut PCB prototype turnaround by up to 2 weeks by bringing assembly in-house on a LumenPnP v4 pick-and-place machine

Advanced Micro Devices Inc.

May 2025 – Aug 2025

Signal Integrity/Power Integrity Intern

Longmont, CO

- Characterized dielectric anisotropy in PCB laminates using Ansys Electronics Desktop to analyze S-parameters and TDR responses, identifying up to 20% anisotropy and its dependence on resin content
- Resolved a stackup that could not be fit as one homogeneous material into two dielectric groups, extracting 11–12.5% anisotropy for the high-resin group and 60% for the low-resin core by sweeping simulation against measurement
- Simulated and evaluated microstrip and BGA via transitions, observing up to a 10 ohm impedance swing in TDR caused by anisotropy, enhancing understanding of material impacts on high-speed signal integrity
- Ran channel simulations to generate eye diagrams under varying anisotropy levels, using Seasim to evaluate signal quality degradation and timing closure impacts in high-speed links

CU Hyperloop

Oct 2023 – May 2025

Circuits Team Member

Boulder, CO

- Designed a PCB using Autodesk Fusion to monitor high-power systems with voltage, current, and GFCI sensors, featuring 24V-5V DC-DC buck conversion and Ethernet communication, enabling real-time monitoring, precise fault detection, and reducing system downtime by 50%
- Designed a second PCB using Autodesk Fusion, incorporating Ethernet connectivity and 12V-5V buck conversion to streamline software testing processes and enhance efficiency in microcontroller analysis
- Soldered and populated over 20 printed circuit boards using reflow ovens and pick-and-place machines to integrate more than 30 onboard machine sensors, enhancing the tunnel boring robot's monitoring capabilities and operational efficiency

Electrical Engineering Department

Jan 2024 – May 2024

Circuits Learning Assistant

Boulder, CO

- Conducted weekly office hours to assist students with their assignments by fostering a collaborative work environment that enhances learning of complex circuit analysis
- Collaborated with the professor via weekly meetings to plan curriculum, contributing ideas for interactive learning activities and ensuring alignment with course objectives

Projects

Photovoltaic Power Conversion System | LTspice, TI C2000, Magnetics, Control Loops, SPWM Feb – Apr 2026

- Designed and built a complete PV power system integrating microcontroller-based MPPT, cascaded DC-DC conversion, battery charge control, and DC-AC inversion, powering a 120 Vrms load at 80% overall efficiency
- Held a PV panel near its 17.2 V maximum power point under 1050 W/m² outdoor irradiance by implementing a Perturb and Observe MPPT algorithm on a TI TMS320F28027 microcontroller to modulate the buck converter's duty cycle
- Boosted a 12 V input to a 149.28 V bus at 84.32% efficiency, closing the loop with an integral compensator for 66.5° phase margin and 0.40% line regulation across 10.99–14.01 V input ranges
- Inverted that bus to 120 Vrms with a single-phase H-bridge using sinusoidal PWM at a 0.94 modulation index, filtered by an LC stage cornered at 5.7 kHz against 50 kHz switching for 19 dB of attenuation

Rechargeable Battery Pack | Li-ion Batteries, Soldering, Testing, ESP32 Nov 2025

- Designed and assembled an 11.1 V, 10.5 Ah (116 Wh) lithium-ion battery pack with integrated BMS protection for a Mars Hard Lander prototype, ensuring safe operation under extreme mission conditions
- Fully characterized charge and discharge behavior using an electronic load, generating complete performance curves
- Performed temperature-controlled testing to validate operation across expected Martian thermal environments and implemented heating/control strategies to maintain cell health and performance

S-Parameter Reverse Engineering | Keysight ADS, Ansys Electronics Desktop, TDR, Python Apr 2025

- Determined an unknown interconnect's physical topology from nothing but a 4-port S-parameter dataset, plotting single-ended, differential and common-mode impedance and proving port symmetry from return and insertion loss
- Built a lumped circuit model tuned against the measured TDR, extracting a 3.3 in coupling length, 16 mil trace width and 36 mil spacing, and quantified its valid bandwidth at approximately 15 GHz by overlaying simulated and measured SDD11 and SDD21

Instrument Droid | Altium, ATmega328P, DAC, Op-amp, Mixed-signal Dec 2024

- Extended a custom Arduino-compatible board into bench instrumentation that automatically measures a power source's Thevenin resistance against current draw, adding a DAC and op-amp output stage, MOSFET drive, current sensing, addressable LEDs and a buzzer
- Diagnosed a destroyed CH340G by tracing where charge could accumulate and discharge into it, then eliminated the failure by replacing a 22 μ F decoupling capacitor with 10 nF and removing a 1 μ F capacitor across the reset switch
- Validated it by cross-checking its Thevenin measurements against values obtained by hand in an earlier lab, then used it to characterize an unknown DC supply

Golden Arduino PCB | Altium, Oscilloscopes, Signal Integrity Oct 2024

- Designed and fabricated a custom Arduino Uno-compatible PCB in Altium using an ATmega328P with both 12 MHz and 16 MHz crystal oscillators, integrated USB-UART (CH340), ESD protection, and dual power inputs
- Applied signal integrity and PCB layout best practices including controlled return paths, decoupling capacitor placement, ferrite bead filtering, and minimized ground plane cross-unders to reduce switching noise
- Characterized the board with oscilloscopes and near-field probes, measuring power rail noise, quiet-high/quiet-low switching, inrush current (2.76 A), steady-state current (319 mA) and ATmega328P Thevenin resistance (32 Ω), and compared its noise and EMI against a commercial Arduino

Hex Inverter Design Test | Altium, Oscilloscopes, Soldering Oct 2024

- Developed and tested PCB designs comparing optimal (ground plane, close capacitor) and suboptimal (no ground plane, distant capacitor) Hex inverters
- Measured switching noise and rail compression, showing a 53% increase in compression in the suboptimal design, demonstrating the impact of layout practice on noise and system performance

Motor Controlled Car | Circuit Design, SIMetrix, Signal Analysis, Arduino Apr 2024

- Designed a speed sensor circuit, a compensator to maintain output accuracy against disturbances, and direction control for maneuverability, verifying each subcircuit in SIMetrix
- Constructed the closed loop feedback system on a breadboard, then tested the car using oscilloscopes and signal analysis on circuit outputs to confirm the design

Reflex Testing Game | Embedded C, STM32Cube, Microcontrollers, SPI Nov 2023

- Developed a reflex testing game with 3 difficulty levels on an STM32 microcontroller's LCD using Embedded C, documenting the code's key functions alongside a step-by-step guide to play

SEIR Markov Chain Model Replication | MATLAB, Differential Equations Dec 2023

- Replicated the SEIR Markov chain model in MATLAB as part of a team, using matrix manipulations to simulate and analyze infectious disease progression, and documented the replication steps for project continuity