

CLEMENT POON

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EDUCATION

The University of Texas at Austin | Austin, TX

Expected May 2028

Bachelor of Science in Electrical and Computer Engineering | **GPA: 3.68/4.00**

Relevant Coursework: Intro to Embedded Systems, Software Design and Implementation, Digital Logic and Design, Circuit Theory, Linear Systems and Signals

EXPERIENCE

Longhorn Rocketry Association | Austin, TX

Aug 2025 – Present

Electronics Member – Payload Subteam

- Designed a custom power schematic and **PCB** with four LiFePO4 cells, BMS, and a buck converter to supply regulated 5V power to the payload's **Raspberry Pi 4**, ensuring stable sensor operation during flight.
- Routed nitinol actuator power directly from the battery through MOSFETs on the custom PCB, bypassing the Raspberry Pi's GPIO pins so the Pi only sends a low-current control signal.
- Interfaced BerryIMU and thermocouple sensors over **I2C/SPI** and wrote **Python data-logging scripts** to record motion, altitude, and temperature throughout launch, flight, landing, and recovery.

Texas Convergent – IoT Subteam | Austin, TX

Jan 2026 – Present

Co-Founder & Hardware Lead, *Mintality*

- Won “**Best Overall Project**” among 9 teams for Mintality, an **ESP32**-based smart planter that pairs with a habit-tracking app to reward completed goals by watering a real plant.
- Wrote **C++** firmware that reads a capacitive soil-moisture sensor, waters the plant with timed pump pulses, and shows the plant's health as one of three animated faces on a TFT display.
- Integrated **Firebase** Realtime Database over **Wi-Fi** to synchronize plant status with the app, process remote watering commands, and adjust CPU frequency and motor-driver sleep to optimize power consumption.

NASA SEES (STEM Enhancement in Earth Science) Internship | Austin, TX

Jun 2024 – Dec 2024

VIPER Team Summer Research Intern, *Presentation, Abstract*

- Led a 6-person team designing a 3D-printable compliant unibody wheel with built-in leaf springs to improve shock absorption and manufacturing simplicity for NASA's VIPER lunar rover in extreme polar environments.
- Ran **finite element analysis** in Autodesk **Fusion 360** across 6 wheel geometries and 3 materials (aluminum, steel, titanium), identifying titanium as the best balance between flexibility and safety factor.
- Presented a research poster on wheel design and simulation findings at the AGU 2024 Symposium, collaborating with VIPER engineers to refine recommendations for rover wheel traction and durability.

STEAMWorks | Austin, TX

Sep 2026 – Present

LEGO Robotics Instructor (Part-Time)

- Co-taught after-school robotics classes for 70+ K–5 students, guiding hands-on engineering and coding using LEGO kits.
- Supported instructors across 5 classes weekly at 12 Austin elementary schools, managing setup and student instruction.

PROJECTS

Doom-Inspired Arcade Machine | *C++, Embedded Systems* | [Demo](#)

- Built a DOOM-inspired FPS from scratch on the MSPM0G3507 ARM Cortex-M0+ **microcontroller** in **C++**, featuring a raycasting 3D renderer with depth sorted animation sprites; won **best project** in an in-class competition.
- Developed a double-buffered audio engine that streams the DOOM theme, footsteps, and sound effects from an SD card to a 12-bit DAC, maximizing data throughput from the 80MHz clock so one buffer fills while the other plays for glitch-free audio.
- Integrated an ST7735 TFT display and SD-card asset loading over **SPI**, housed in a self-designed **3D-printed** arcade cabinet with speaker enclosure powered by a separate amplifier and a 5V external battery.

FPGA Drumming Game | *Verilog, Digital Logic, FPGA*

- Designed a Taiko drumming game in **Verilog** on a Basys3 (Artix-7) **FPGA**, where players set a note pattern with 16 switches and press buttons in sync as it scrolls across the seven-segment display.
- Built the game from 10 modules and a 12-state FSM across two clock domains, with 3 scroll speeds and final score calculation, and validated it in **Vivado simulations** before deploying to hardware.

Vehicle Power, Electrical & Audio Systems | *Electrical Wiring, Embedded, Sensors* | [Portfolio](#)

- Wired a model car to mirror a real vehicle's signals in real time via 8 relays, powering the system from a **12V battery** through buck converters stepped down to 5V to drive **microcontrollers** controlling other in-vehicle functions.
- Distributed power to 3 amplifiers through dedicated distribution blocks, with temperature, **humidity, vibration, and sound sensors** monitoring the audio system's operating environment and responding to overheating.

SKILLS

Programming and Design Tools: C++, C, Java, Python, Git, Linux, MATLAB, Firebase, ARM Assembly, Verilog, Design Verification, Vivado, PCB Design, KiCad, Altium, LTSpice, Finite Element Analysis (FEA), Fusion 360 Certified, AutoCAD, Adobe Suite

Lab & Hardware: Oscilloscope, Multimeter, Bench Power Supply, Soldering & Reflow, SMD & Through-Hole, Crimping/Harnessing, 3D Printing, Raspberry Pi, Microcontrollers, FPGAs