Emmanuel Che

Riverside ↔ Costa Mesa, CA | (949) - 434 - 9049 | eche003@ucr.edu | LinkedIn

Education

University of California, Riverside **- B.S in Electrical Engineering**, GPA: 3.4 — **Expected June 2027**

Skills

Electrical & Hardware: schematic capture, PCB layout, DC-DC power stage design, analog front-end design, mixed-signal design, component selection, embedded C/C++, PCBA & rework, multimeter & oscilloscope debugging

Software & Tools: Altium Designer, STM32CubeIDE, LTspice, MATLAB, Simulink, VS Code, PlatformIO

Project Experience

Hardware Test Lead — Highlander Space Program - UC Riverside — **June 2024 - Present**

Student Liquid Rocket Project | C/C++, GitHub, Altium Designer, LTspice, STM32CubeIDE

- **Designed a rocket pad controller PCB in Altium Designer** around an STM32 MCU with CAN, FS USB-C, and an external XBee radio link via headers, 11.1V to 6V buck and 6V to 3.3V LDO, and 3 fail-safe armed low-side pyro channels, enabling servo actuation and fill-to-fire ignition sequencing used in a **1st-place FAR-OUT 2025 competition run**
- **Designed an igniter and heater interface PCB in Altium Designer** around an STM32 with CAN for a LOX liquid rocket project, generating 12V and 3.3V from a 24V input, implementing low-side MOSFET switching for the heater load, and an opto-coupled PWM command interface to an external igniter controller, improving noise robustness and reducing false-trigger risk during ignition operations
- **Defined ground safety logic and CAN command/telemetry between ground control and pad hardware**, implementing **state-based control in STM32CubeIDE using C** to align firmware behavior with electrical arming conditions
- **Led PCB bring-up and wire-harness integration** using oscilloscope and multimeter checks of power rails and interfaces, reducing hardware bring-up risk and integration issues
- **Delivered flight ready ground and pad electronics for a 1st-place FAR-OUT 2025 run, coordinating with mechanical and data acquisition teams for smooth fill-to-fire operations**

Project Lead — Student Project - UC Riverside — **April 2025 - Present**

Underwater Vehicle Project | C/C++, Altium Designer, STM32CubeIDE

- **Defined the project scope for a torpedo-style underwater vehicle** centered on CAN-tethered control and a buoy link, leading a 4-member team building custom hardware and software
- **Designed a fast prototyping power and control PCB around an STM32 in Altium** that delivers 7.4V for multi servo loads, regulated 5V and low noise 3.3V for a Raspberry Pi and sensors, and a 16V ESC feed, with fuse and TVS protection, reverse polarity protection, voltage and current telemetry, an MCU-controlled high-side load switch, and FS USB-C, microSD via SDIO, and CAN connectivity for logging and bring-up
- **Led bench bring-up and validation of the power/control PCB and motor controller PCB**, verifying power rails first then interfaces using oscilloscope and multimeter checks to reduce first power-on risk
- **Collaborated with mechanical design to develop a modular electronics tray system** for the underwater vehicle hull, defining PCB mounting, connector access, and wire-harness integration

Associate Engineer — Highlander Racing - UC Riverside — **September 2023 - June 2024**

Formula SAE | Altium Designer, Saturn PCB Toolkit

- **Routed 2-layer and 4-layer PCBs in Altium** by translating schematics into PCB layout, selecting stackups within manufacturer limits and using Saturn PCB Toolkit to size traces and vias, applying placement, grounding, decoupling, and DFM checks for manufacturable prototypes

Analog Circuit Design Challenge — IEEE Student Branch - UC Riverside — **December 4, 2025**

IEEE @UCR | Altium Designer, LTspice

- **Defined requirements** in a 2-hour IEEE mini design competition to convert a photodiode signal into a 0-5V output with < 10 ohm output impedance and high-frequency noise rejection
- **Created an Altium schematic and BOM** for a photodiode transimpedance amplifier plus buffer, selecting parts from datasheet limits for stability and bandwidth
- Sized transimpedance gain and feedback filtering from the target output swing and noise cutoff goals
- **Verified < 10 ohm output impedance** in LTspice using AC injection across frequency, **winning the competition**