

DANIEL ROMERO

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| Portfolio: electricalromero.com | GitHub: <https://github.com/danromero1>

EDUCATION

California State Polytechnic University, Pomona, CA
Bachelor of Science in Electrical Engineering, May 2026

SKILLS

Embedded: C/C++, bare-metal, interrupts/DMA, timers, SPI, I²C, FS USB, UART, resource-constrained systems

Platforms: STM32 (F3/F1/H7), PIC18F, ESP32, RP2040, Raspberry Pi (Embedded Linux/SSH)

DSP/Control: CMSIS-DSP, FIR/IIR, soft-clipping distortion/EQ, PID, MATLAB FFT (noise/linearity)

Hardware: Mixed-signal audio, op-amps, ADC/DAC, anti-alias filters, grounding/SI, USB-C, buck+LDO, ESD/TVS

Tools: STM32CubeIDE, MPLAB X, LTspice, MATLAB, Python, Linux, Git, oscilloscope, logic analyzer

PROJECTS

Mixed-Signal Guitar Effects Pedal (USB-C, STM32, ADC/DAC) [\[GitHub\]](#)

Aug 2025 - Present | Independent Project

- Implemented real-time DSP in C using CMSIS-DSP (soft clipping, EQ) targeting <5 ms end-to-end latency
- Designed mixed-signal signal chain including anti-alias filtering, biasing, and ADC/DAC interfacing
- Completed schematic capture, 4-layer PCB layout, and manufacturing release (Gerbers, BOM, pick-and-place)
- (Planned) Bring-up and debug of custom hardware using SWD, register inspection, and peripheral validation
- (Planned) Timer-triggered ADC sampling with DMA double-buffering and ISR profiling for deterministic audio streaming

Reconfigurable Space Computing Lab - Submarine Drone (Team Lead)

Sept 2025 - Present | Cal Poly Pomona RSCL

- Designed and executed electrical and thermal stress testing with real-time telemetry acquisition
- Instrumented power electronics to measure MOSFET temperature, ESC ripple, battery sag, and PWM behavior
- Correlated LTspice and Monte Carlo models with measured degradation trends for reliability analysis

Embedded Linux Systems Projects (Raspberry Pi 5, C, POSIX) [\[GitHub\]](#)

Fall 2025 | Operating Systems for Embedded Applications Coursework

- Implemented a custom shell using fork/exec, argument parsing, and process control
- Built a lottery/stride scheduler simulator modeling fairness, context-switch overhead, and execution timing
- Developed multithreaded programs using pthreads and mutexes to analyze race conditions and critical sections
- Wrote a Linux character device driver with ioctl control and user-space interface via custom test application
- Built and deployed kernel modules using Makefiles; managed device nodes and permissions on embedded Linux

Wireless PID Motor Control System (Arduino, nRF24L01, LabVIEW) [\[GitHub\]](#)

Aug 2025 - December 2025 | Course Project

- Implemented closed-loop PID motor speed control using interrupt-driven encoder RPM feedback
- Designed discrete PID controller with anti-windup, derivative damping, and bounded PWM actuation
- Built non-blocking embedded firmware with deterministic timing for control, sending, RF, and UI
- Implemented bidirectional nRF24L01 wireless commands and real-time telemetry (state, PID mode)
- Validated performance using LabVIEW-based data acquisition for RPM, PWM, and step-response analysis

Wet Bulb Globe Temperature Monitor (USB-powered, PIC18F4321) [\[GitHub\]](#)

Jan 2024 - May 2024 | Course Project

- Integrated temperature, humidity, light, and wind sensors via DHT11 single-wire, bit-banged I²C, and ADC inputs
- Implemented WBGT computation and threshold-based heat stress classification aligned with safety guidance, with real-time LCD feedback
- Developed resource-constrained firmware using FSMs and fixed-point arithmetic to fit within PIC memory limits