DANIEL ROMERO

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EDUCATION

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

SKILLS

Embedded: C/C++ (PIC18F4321, STM32F103), SPI/I2C/UART, bit-banged I2C, timers/IRQs, FSMs, 16x2 LCD
Mixed-Signal: Op-amps, 3rd-order ~25 kHz AA, pseudo-diff buffering, ADC/DAC, level shifting
Power/Protection: USB-C, buck to LDO 3.3 V, decoupling, ESD/TVS, crystal/clocking, EMC/EMI basics
EDA/Manufacturing: KiCad 2-4 layer, Altium (basic), ERC/DRC, stackup/impedance, Gerbers/BOM/pos, DFM
Test/Validation: Oscilloscope, logic analyzer, AWG, DMM; MATLAB FFT (noise/linearity); bring-up/loopback
Tools & Platforms: STM32CubeIDE, MPLAB X, LTspice, MATLAB, Python (PyTorch), Linux (threads/sockets), Git

PROJECTS

Senior Design Project September 2025 - Present

Autonomous Drone-to-Drone Docking (In Progress)
Role: Embedded & DSP (planned)

- Planned scope: Own embedded comms pipeline (IR/beacon link): packet format, error handling/CRC, and throughput/latency profiling.
- Planned DSP & controls: Develop signal filtering/sensor fusion for docking cues, feed a closed-loop controller and log telemetry.
- Planned validation: Bench + field test plans with pass/fail criteria; data capture, and analysis (MATLAB/Python)

Independent Project August 2025 - Present

Mixed-Signal Signal Analyzer & Generator (USB, STM32, ADC/DAC)

- System & Parts: Captured requirements/block diagram; selected STM32 MCU, ADC/DAC, and USB-C power; planned pinout in STM32CubeIDE.
- Analog front end: Designed 3rd-order ~25 kHz Butterworth anti-alias filter and single-ended to pseudo-diff buffer for the ADC; simulated stages in LTspice; added ESD/EMI protections and decoupling.
- Power & digital: Implemented buck to LDO 3.3 V tree; crystal + SWD headers; USB device circuitry.
- PCB & mfg: Completed 4-layer KiCad layout with return-path/pours and controlled-impedance routes; passed ERC/DRC; generated Gerbers/BOM/pick-and-place (pos/xy) and assembly docs.

Course Project January 2024 - May 2024

Wet Bulb Globe Temperature Monitor (USB-powered, PIC18F4321)

- Sensor integration: Read DHT11 (temp/RH), BH1750 (bit-banged I2C), and an analog wind sensor on the ADC; computed WBGT and displayed risk categories on a 16x2 LCD.
- Low-level & constraints: Implemented software-I2C (start/stop, byte R/W, ACK/NACK); used fixed-point math and trimmed strings to meet PIC flash/RAM limits; on-LCD status/debug.
- Verification & docs: Sequenced peripheral init, validated scaling on scope, and documented wiring/build notes for reproducible bring-up.

Independent Project December 2023

STM32 KiCad PCB

- Built a small development board leveraging the STM32 microcontroller and KiCad.
- Included decoupling capacitors for power pins and added a ferrite bead for filtering on VDDA pin.
- Labeled differential pairs appropriately on schematic for simplification when designing PCB.
- Learned importance of load capacitance when choosing an external clock crystal.