

Jair Pacheco

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SUMMARY: Electrical Engineering student (B.S., May 2026) specializing in embedded systems, microcontroller firmware, and hardware-software integration. Experienced in low-power system design, multi-protocol communication, and field-ready embedded hardware through hands-on development of solar-powered control and telemetry systems. Seeking to contribute strong technical execution and practical engineering skills to teams building reliable, real-world embedded solutions.

TECHNICAL EXPERIENCE

- Developed firmware for PIC18F47K42, ESP8266, and Particle Boron microcontrollers using UART, SPI, and I2C communication.
- Performed system-level testing using oscilloscopes, DMMs, Analog Discovery, and Keysight FieldFox to verify signal integrity and sensor accuracy.
- Conducted power-budget modeling for solar-powered embedded systems, identifying firmware and hardware optimizations to reduce system draw.

PROJECTS

REACH — Remote Energy Access and Control Hub (Senior Design Project)

- Designed a field-deployable power-management system integrating with 12 V solar infrastructure to supply reliable power and connectivity to remote sensors and devices.
- Developed embedded firmware for Particle Boron (LTE) and ESP8266 (WiFi), implementing a two-way UART protocol for command routing, telemetry, and scheduled outlet control.
- Designed a four-channel power-distribution module with MOSFET high-side switching, achieving ± 0.1 V and ± 0.1 A measurement accuracy.
- Implemented a local WiFi access point and embedded control webpage, plus a 20×4 LCD interface for on-site diagnostics and manual override.
- Validated communication reliability, sensor accuracy, LTE data transmission, and power-budget performance for off-grid operation.

SKILLS

Hardware: Oscilloscope, DMM, power supplies, soldering, SPI, I2C, UART, Analog Discovery, Keysight FieldFox

Embedded Systems: C, C++, Python, PIC18F47K42, ESP8266, Particle Boron, interrupts, timers, peripheral configuration, firmware debugging

Software & Tools: MATLAB, LTspice, Vivado, ROS2, MPLAB X, Cisco Packet Tracer

Control & Signal: PID tuning, filtering, motor control

Languages: English, Spanish

EDUCATION

B.S. Electrical Engineering — Sonoma State University

Expected Graduation: May 2026

GPA: 3.74

Relevant Coursework: Control Systems, Power Electronics, Digital Design, Electromagnetics, Robotics & Computer Vision, Intro to Internet-of-Things, Advanced Digital System Design, Intro to Optical Fiber Communications, Intro to RF Communications