Pedro Zambrano-Saucedo

El Paso, TX | +52 (656) 457 4794 | pazambranosauc@miners.utep.edu | linkedin.com/in/pedro-zamsau | pazambranosauc.github.io/pazambranosauc

EDUCATION

The University of Texas at El Paso | B.S. Electrical Engineering — Expected May 2029

GPA: 3.76 / 4.00

Relevant Coursework: Software Design (C), Physics II: Electromagnetism, Introduction to ECE, Calculus II; Spring 2027: Digital Systems I with Lab, Electric Circuits I, Differential Equations

TECHNICAL SKILLS

Hardware: PCB and board-level design (KiCad), schematic capture, ERC/DRC, soldering (through-hole, basic SMD), prototyping, multimeter, bench power supply, oscilloscope (basic)

Embedded Systems: ESP32, ESP-IDF, C, I2C, UART, GPIO

Programming and Tools: C, Python (basic), Linux (SSH, systemd), Git, MATLAB (basic), Fusion 360

Currently Learning: Verilog and digital logic design (Digital Systems I, Spring 2027)

ENGINEERING PROJECTS

Custom ESP32 Development Board | KiCad, PCB Design — Jun 2026 - Present

- Designed a two-layer ESP32-WROOM-32 printed circuit board (PCB) from a blank schematic: USB-C input with CC pull-down resistors, AMS1117-3.3 LDO regulator, and CP2102N USB-UART bridge.
- Built a two-transistor (MMBT3904) auto-reset circuit so DTR and RTS drive EN and IO0, enabling flashing from the IDE with no jumper or external programmer.
- Caught a TX/RX crossover, misplaced bypass capacitors, and incorrect pull-up values across six schematic revisions by checking component datasheets against the schematic.
- Routed with a ground pour, stitched thermal pad, and antenna keep-out; passed ERC and DRC clean. Board ordered from JLCPCB; bring-up and testing pending.

ESP32 Handheld Game Console | C, ESP-IDF — Apr 2025 - Sep 2026

- Wrote Flappy Bird, Snake, and Tetris in C on ESP-IDF using the native toolchain (CMake/Ninja, menuconfig, idf.py) instead of the Arduino framework.
- Implemented fixed-step game timing independent of frame rate, collision logic, and input debouncing, driving an I2C OLED display.
- Took the design from breadboard prototype to a soldered unit in a Fusion 360 enclosure, relocating the cable exit after handling tests.

Competition Robot Redesign | FIRST Tech Challenge Team 15450, Fusion 360 — 2024 - 2025 Season

- Traced repeated scoring failures to samples slipping from the claw, costing 5 to 10 s per recovery on a 7 to 11 s cycle; replaced thicker jaws with cast two-part RTV silicone grip tips from a mold I designed.
- Fixed tip detachment on the third iteration by replacing small keying holes with one large through-hole for mechanical locking, and chose mold and claw materials by silicone adhesion.
- Designed a triangular truss that stopped the arm flexing and jamming at full extension; after the fixes the team averaged about 12 samples per match (peak 17).

PLC Traffic Light Controller | CodeSys, Ladder Diagram — Jul 2026 - Sep 2026

- Built a Ladder Diagram state machine with TON timers, a CTU counter, and latched step bits driving lamp outputs; traced a stalled cycle to a wiring error and corrected it.

EXPERIENCE

Technology Support Specialist | The University of Texas at El Paso — Jul 2026 - Present

- Diagnosed about 90 student loan laptops with hardware diagnostics, tracing about 50 to failing batteries and isolating fan, SSD, and RAM failures before replacing the faulty component.
- Configure BIOS/UEFI settings (AHCI storage mode, IPv4 network boot order) and reimaged about 90 more units on a pre-semester deadline.

Chief Engineer | UAH InSPIRESS (high school team) — Jan 2024 - Apr 2025

- Led an 11-person team designing an autonomous Titan science payload; set the two-payload architecture, reviewed team CAD and calculations, and closed the design at 8.23 kg against a 10 kg limit.

AWARDS AND ACTIVITIES

Awards: Innovate Award, FIRST Tech Challenge (2024-25); Texas State Championship qualifier (2024, 2025); 1st Place Outreach, UAH InSPIRESS

Activities: IEEE, IEEE AESS, IEEE RAS (RTX Autonomous Vehicle Competition team), SHPE/MAES, Orion Robotics Team