Emil Guzman

emilguzman2021@gmail.com | (661)-425-4474 | LinkedIn | Github | Los Angeles, CA

Education

University of California – San Diego September 2021 – June 2025

B.S. Computer Engineering, Minor: Physics *GPA: 3.5/4.0*

Relevant Coursework: Wireless Embedded Systems, Robotic System Designs & Impl, Computer Architecture

Skills

Programming Languages: C, C++, Java, HTML, Python, Verilog, SystemVerilog, Assembly

Development Boards: STM32L4(ARM Cortex-M4), Raspberry Pi 5, Xilinx Zynq FPGA

Tools: Git, Logic Analyzers, Oscilliscopes, Autodesk Fusion360, Cadence SPICE

Techniques: I2C, SPI, UART, BLE, Bare-metal programming, Device Drivers

Project Experience

LEDancer | *Verilog, Xilinx Zynq FPGA* October 2025 – Present

- Designing an embedded system on the Real Digital Blackboard (Xilinx Zynq FPGA) to sense environmental sounds and map frequency and amplitude to color and intensity on LEDs.
- Planning to compare performance between hardware-accelerated FPGA logic and ARM software execution.
- Currently familiarizing myself with the board and researching end product hardware components.

YouLostIt Wireless Tracking Device | *C, STM32L4(ARM Cortex-M4)* January 2025 – March 2025

- Built a wireless tracking device on ARM Cortex-M4 with Lost/Found modes for real-time status.
- Integrated accelerometer via I2C and implemented BLE protocols for communication.
- Cut power usage by 98% in Lost mode and 80% in Found mode while meeting aggressive time constraints.

SmartCart Real-Time Tracking | *Python, Raspberry Pi 5* January 2025 – March 2025

- Developed a real-time embedded system on a Raspberry Pi 5 for autonomous in-cart product recognition, implementing FSM for image capture, object detection, and servo-based camera control.
- Integrated sensors, peripherals, custom CNN, and computer vision algorithms for item tracking.
- Enabled wireless data exchange for user-based product comparison.

AirGeisel Quadcopter | *C++, PCB Design* September 2024 – December 2024

- Designed, developed, manufactured, and operated a custom PCB flight controller, integrating an PID controller, IMU sensors, and power circuitry to achieve stable and precise flight control.
- Conducted system-level testing and debugging to ensure reliable flight performance, reducing control-loop latency by 36% through firmware optimization while maintaining clean, modular, and scalable code practices.
- Iterated rapidly on PCB design and firmware integration, refining PID tuning, sensor calibration, and hardware connections in parallel to meet aggressive timelines and ensure consistent flight stability.

Jingles Microprocessor | *SystemVerilog* March 2024 – June 2024

- Designed a digital RISC-based 9-bit instruction set architecture with an 8-bit memory microprocessor, developing custom machine code, assembly language, and a compiler to execute arithmetic and logical operations.
- Implemented and verified processor functionality by executing 8-bit algorithms including Hamming distance calculation, two's complement addition, and multiplication using SystemVerilog simulation and waveform analysis.

Clubs

Society of Hispanic Professional Engineers (SHPE) | *Outreach Member* September 2024 – June 2025

- Led STEM outreach events including Tijuana Outreach and San Diego Festival of Science, promoting engineering education in underserved communities.

Work Experience

Triton Transportation Services | *Operations Support Training* August 2023 – August 2025

- Logged 1000+ safe driving hours and trained 25+ employees in compliance with DOT safety regulations.