

Emil Guzman

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Qualifications

An embedded firmware engineer with a B.S. in Computer Engineering and minor in Physics from UC San Diego. Experience in PCB design with the ability to interpret and read electrical schematics and datasheets. Proficient with Git and familiar with Python and assembly. Skilled in C/C++ on ARM Cortex-M4 microcontrollers, bare-metal programming, and hardware driver development. Experienced with BLE, I2C, and real-time debugging using logic analyzers and oscilloscopes. Strong foundation in developing low-level drivers and hardware abstraction layers for sensors and communication protocols. Strong problem-solving ability. Combines technical rigor with an eye for aesthetics and design, bringing creativity to engineering solutions.

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 Sys Designs & Impl

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, Autodesk Fusion360, Logic Analyzers, Oscilloscopes, Cadence SPICE

Business Software: Microsoft Office(Teams, Word, PowerPoint, Excel), Google(Docs, Sheets, Slides), Zoom

Project Experience

Reactive LEDs, *Embedded Engineer*

August 2025 – Present

- Designing an embedded system on the Real Digital Blackboard (Xilinx Zynq FPGA + ARM processor) to map frequency and amplitude to color and intensity.
- Planning to benchmark and compare performance between hardware-accelerated FPGA logic and ARM software execution.
- Currently researching prototype and end product components.

YouLostIt Wireless Tracking Device, *Embedded Systems Engineer*

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.
- Used clever power optimization strategies to cut power usage by 98% in Lost mode and 80% in Found mode while meeting time constraints.

SmartCart Real-Time Tracking, *Embedded Systems Engineer*

January 2025 – March 2025

- Developed real-time embedded system on Raspberry Pi 5 for in-cart product recognition.
- Integrated sensors, peripherals, and computer vision algorithms for item tracking.
- Enabled wireless data exchange for user-based product comparison.

AirGeisel Quadcopter, *Firmware/Controls Engineer*

September 2024 – December 2024

- Designed, developed, manufactured, and operated custom PCB for stable flight.
- Conducted system-level testing/debugging to ensure reliable flight until battery depletion.
- Iterated rapidly on PCB design and firmware integration to meet aggressive timelines.

Work Experience

Triton Transportation Services, *Operations Support Training/Student Driver* August 2023 – August 2025

- Logged 700+ safe driving hours, conducted fleet inspections, and trained 25+ employees in compliance with DOT safety regulations.

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.