Alberto Trejo

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EDUCATION

Boston University (College of Engineering) **–** Boston, MA May 2026
Bachelor of Science in Electrical Engineering

EXPERIENCE

Grounded Low Voltage (GLV) Lead*,* Terrier Motorsport May 2024 – Present

- Collaborated with a multidisciplinary team to design and fabricate an electrical system for an electric race car competing in SAE's Formula Hybrid + Electric competition within a 1-year design cycle
- Led a team of 15 engineers redesigning the GLV shutdown loop, an electrical hierarchy comprised of low voltage and manual control mechanisms (i.e. latching relays, push-pull buttons) used to shut down the vehicle's HV system
- Oversaw production, testing, & validation of 10 PCBs for proper functionality utilizing to test plans and operation diagrams
- Devised & manufactured the Tractive System Active Lamp control board in KiCad using analog devices and monolithic ICs, ensuring proper documentation and compliance with competition rules
- Standardized PCB designs by validating footprints, symbols, and board size limitations (100x100mm) while optimizing vendor selection for cost, manufacturability, and fabrication time

Electrical Engineering Intern*,* Noble Carbon Jun 2025 – Aug 2025

- Executed calibration and validation testing from 1W to 1100W using regression-based models; diagnosed and repaired units by reworking resistors, capacitors, ICs, and PCB traces
- Performed precision soldering and mechanical integration including SMD soldering, bus bar fabrication, relay mounting, wire routing, and noise reduction testing to ensure reliable system behavior
- Streamlined production workflow by consolidating and categorizing component inventory, identifying bottlenecks, and adapting assembly processes to meet fast-paced startup deadlines
- Supported final product demonstrations by assembling two functional demo panels that showcased system functionality and communication for possible partners, investors, and technical stakeholders
- Collaborated cross-functionally with supervisors to refine housing enclosures, wiring methods, and PCB adjustments, improving manufacturability and long-term system reliability

Tractive System (TS) Lead*,* Terrier Motorsport Sep 2023 – Dec 2023

- Reviewed & designed bus bar connections specified for vehicle's accumulator system ($\sim 240V_{nom}$, ~150A)
- Coordinated with mechanical engineers to build an accumulator housing, guaranteeing proper insulation and space for 660 (18650 style) cells divided into 6 segments (66s/10p) plus supporting circuitry
- Consolidated and organized legacy system documentation into an accessible online library, streamlining system and design knowledge transfer from experienced engineers to new members

PROJECTS

Snake Game Nov 2024 – Dec 2024

- Used Verilog (VHDL) to program a functioning snake-like game controlled with an FPGA development board (Nexys4) and displayed through a VGA controller ensuring design parameters such as resolution and refresh rate
- Developed game logic such as score, lose conditions and random object generation though combinational logic and Finite State Machines, integrating different game modes, clock speeds, and displays facilitating game predictability
- Tested & debugged clock synchronization and module interactions to certify stable gameplay and accurate timing transitions

Lie-Detecting Device Sep 2023 – Dec 2023

- Engineered & assembled a lie detecting tool with a budget of $200, incorporating client feedback and restrictions
- Generated & implemented circuit schematics using KiCad, integrating displays for real-time feedback, sensors for physiological signal detection, and microcontrollers to process data and determine potential deception
- Utilized OnShape (CAD) to design a housing enclosure, fabricated using laser cutting and PVC acrylic
- Reviewed data sheets and circuitry to optimize sensor functionality and product reliability while prototyping

Temperature Sensing Device Jan 2023 – May 2023

- Assembled & programmed a real-time temperature sensing device to alert users of temperatures outside pre-programmed range through microcontrollers and sensors (Arduino UNO, TMP36) with 92% accuracy
- Produced a housing enclosure and 3D printed components to mount hardware as displayed on final CAD rendering
- Verified system's signals to enhance microcontroller and sensor performance through data sheet analysis and code debugging

AWARDS & INVOLVEMENTS

IEEE-HKN, Vice-president May 2025 – Present

- BU's invite-only IEEE honor society recognizing academic excellence and promoting professional development

Society of Hispanic Professional Engineers (SHPE), Member Sep 2024 – Present

- Empowers Hispanic students and professionals in STEM through networking, professional development, and community outreach

Hispanic Scholarship Fund (HSF) Scholar, Recipient Jul 2023 – Present

- Advocates for educational equity providing financial aid and an extensive network aimed to empower Hispanic leaders achieve academic and professional goals

SKILLS

Software: KiCad, Fusion, LTspice, Fusion, OnShape, MATLAB, Python, Verilog, GitHub, Google Suite, Microsoft Office, 3D Printing & Slicing
Electrical: Soldering, Circuit Design, PCB Design, PCB Rework, Electrical Architecture, Signal Analysis, Test Plans