Carlos Gael Hernandez Castro

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EDUCATION

University of Texas at El Paso (UTEP) El Paso, TX
*Bachelor of Science in Electrical Engineering, Minor in Finance. GPA: **4.0/4.0*** *Expected Graduation: May 2029*
Honors: College of Engineering Honors Program, Hispanic Scholarship Fund Scholar, UTEP Excellence Scholarship
Relevant Coursework: Electronics, Digital Design, Electromagnetism, Signals & Systems

EXPERIENCE

Ground Station Engineer Jan 2025 – Present
Sun City Rocket Team (UTEP) *El Paso, TX*
- Designed a **real-time telemetry ground station** that decodes framed DAQ packets and plots pressure, temperature, and inertial data in flight, supporting **2nd place at IREC 2025** (30k ft COTS) and 1st at the 2025 Lone Star Cup.
- Built an **Arduino Mega DAQ shield** that conditions 4-20 mA pressure transducers (precision shunt, op-amp front end) and K-type thermocouples, with ADC scaling and packet framing so the ground station receives calibrated values.

Hardware and AI Data Intern Jun 2026 – Aug 2026
ArcellAI, Physical AI and robotics data platform *San Francisco, CA*
- Built a standalone **Python data loader for LIBERO**, a robot-learning benchmark, adapting PyTDC's inheritance-based loader architecture and classifying grasp-prediction tasks as single- vs. multi-instance prediction.
- Managed GitHub repository access and structure, onboarded new team members, and tracked sprints in ClickUp.

FIRE Venture Fellow Mar 2026 – Jun 2026
Hunt Center for Entrepreneurship, NMSU Arrowhead Center *Las Cruces, NM*
- Evaluated a live regional startup on market, team, traction, and cap table (seed and Series A dilution, vesting).
- Wrote an investment thesis on **AI-powered grid orchestration**, grounded in FERC Order 2222.

Undergraduate Researcher Sep 2025 – Nov 2025
Miner Spark Research Project, University of Texas at El Paso *El Paso, TX*
- Developed a modular UAV attachment that runs **facial verification on-device** (edge computer vision) for low-cost drones.
- Measured recognition accuracy across lighting levels (lux) to validate the system's hardware-software integration.

PROJECTS

The Sense Cube: Phone-to-Braille Reader | *Founder and Hardware Lead* Apr 2024 – Present
- Designed a **2-layer KiCad evaluation board** that drives **48 solenoid dots** across 8 Braille cells from a few Arduino pins (four 74HC238 decoders, TBD62783 source and TD62083 Darlington sink drivers), plus the 7.6 × 29.7 mm Braille cell PCB and a third-revision Fusion 360 solenoid carrier.
- **Verilog verification (in progress):** Modeling the board's decoder matrix in RTL, with a self-checking testbench to confirm each of the 48 dots fires alone.

Transistor-Level Digital Logic | *Independent* May 2025
- **4-bit calculator:** Built a 4-bit adder/subtractor from **200+ discrete BJTs** with no logic ICs or microcontroller, from a NAND-derived gate set (NOT, AND, OR, XOR) up to chained full adders and a transistor-level 7-segment decoder.
- **Up/down counter:** Designed a 000-999 counter/timer with a NAND relaxation-oscillator clock (~3.5 kHz), AND-gate decade detection that forces BCD rollover and carry, and up/down, reset, and pause control.

Wayve Smart Navigation Cane | *BorderHack '26, 1st Place* May 2026
- Built in 24 hours with a 4-person team, turning **Google Maps Directions API** steps into wrist cues from 3 handle servos.
- Added **ultrasonic obstacle sensing** that ramps vibration intensity as obstacles come within ~1.5 m.

AWARDS & LEADERSHIP

- **Pitch Competitions (Sense Cube):** Won $6,000 across three competitions, including **1st of 60+ entries** at UTEP Miner Pitch and 2nd at Miner Tank.
- **SOLACYT International Competition: Top 3** of 25,000+ students across Ibero-America (Chile, Colombia, Uruguay, Mexico) with a robotic skeleton puppet that improved students' anatomy knowledge by ~60%.
- **Robotics Team Lead (2022):** Led a 6-person team that raised $750+ and built a **custom electric wheelchair**, and founded a robotics workshop for 20+ students.

TECHNICAL SKILLS

Hardware: Circuit design, schematic capture, 2-layer PCB layout, analog signal conditioning (op-amps, 4-20 mA, thermocouples), solenoid driver stages, transistor-level digital logic, AC-DC rectifier supplies, DAQ, soldering, prototyping

Programming and Embedded: Python, C, C++, MATLAB, Verilog (learning), Arduino, ESP32, Raspberry Pi, Bluetooth

Tools: KiCad, Fusion 360 (Autodesk Certified User), Git/GitHub, FDM 3D printing | **Languages:** English, Spanish (fluent)