Carlos David Juárez Rivera

Electrical Engineering Student
Embedded Systems, Controls & Electronics Internship Candidate
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Education

Bradley University - Peoria, IL | Expected May 2027
Bachelor of Science in Electrical Engineering, Robotics & Controls Concentration, GPA: 3.6
Relevant Coursework: Electronics, Embedded Systems, Discrete-Time Signals,
Probability & Statistics for EE, Robotics & Controls
Honors: Dean's List
Illinois Central College - East Peoria, IL | May 2025
Associate in Engineering Science, GPA: 3.56 | Associate of Arts in Business Administration, May 2018
Honors: Phi Theta Kappa

Technical Skills

Programming: C, C++, MATLAB, Python
Embedded Systems: Teensy 4.1, ESP32/ESP32-C3, Arduino, AVR, Microcontrollers, GPIO, SPI, I2C, I2S, BLE
Controls & Simulation: MATLAB/Simulink, PSpice/LTspice, PID control, step-response analysis, system validation, basic PLC programming, Allen-Bradley fundamentals
Circuits & Lab: Analog/digital circuits, op-amps, RC filters, diode clipping, MOSFETs/BJTs, oscilloscope, function generator, multimeter, bench supply
Signal Processing: ECG/PPG analysis, Pan-Tompkins QRS detection, FFT basics, digital filters, waveform/waveform-synthesis analysis
CAD / Languages: Creo Parametric | English, Spanish

Engineering Projects

Polyphonic Digital Synthesizer | Teensy 4.1, Audio Shield, Embedded C/C++
Built a real-time polyphonic synthesizer using Teensy 4.1, Teensy Audio Shield, MIDI input, and Teensy Audio Library.
Implemented four-voice synthesis, ADSR envelopes, waveform switching, chord buttons, drum sequencing, and real-time parameter control.
Added Arduino-based LCD display, LED feedback, ultrasonic gesture control, and serial communication with the Teensy.
Wrote a Python MIDI router to forward MPK Mini keyboard input to the Teensy during development and testing.
Real-Time ECG Processing & Arrhythmia Detection - Team Project | ESP32-C3, C, Python, BLE, DSP
Helped validate a wearable heart-monitor prototype using fixed-point Pan-Tompkins QRS detection at 200 Hz.
Supported MATLAB-vs-C comparison, integration testing, and documentation of accuracy, latency, memory, BLE, and battery results.
Guitar Overdrive Pedal - Team Project | Analog Circuits, LM324 Op-Amp, Diode Clipping, PSpice
Helped design, simulate, and test an LM324 guitar overdrive circuit with RC filtering and 1N4148 clipping diodes.
Verified clean-to-clipped waveform behavior using a function generator, oscilloscope, 9 V bench supply, and 3PDT footswitch.
Automated Insulin Pump Control System - Team Project | MATLAB / Simulink
Modeled a closed-loop glucose-insulin control system and analyzed system response in MATLAB/Simulink.
Tuned controller gain to approximately 7% overshoot and measured rise time, settling time, and steady-state response.
RFID Attendance System - Team Project | ESP32, RC522 RFID, Touchscreen UI, Wi-Fi Backend
Supported integration testing and documentation for ESP32 attendance prototype using RFID scanning, touchscreen UI, Wi-Fi/HTTPS logging, and Google Sheets backend.

Engineering Experience

Engineering Intern & Apprentice | Liebherr - Kempten, Germany | 2016
-Designed, assembled, and tested mechanical and electronic components for industrial prototype systems.
- Supported prototype iteration by helping identify design issues and improve system performance.
-Gained hands-on exposure to precision manufacturing, CAD modeling, testing, and cross-functional engineering workflows.

Additional Experience

Server & Bartender | Buffalo Wild Wings - Peoria, IL | 2022 - Present
-Managed high-volume service for 150–200+ customers per shift while maintaining accuracy, organization, and speed under pressure
Coordinate with team members in a fast-paced environment requiring reliability, communication, and problem solving.
Digital Media Analyst | HGS - Peoria, IL | 2019-2022
-Analyzed Walmart and Sam's Club digital content workflows, documented issues, and supported reporting/process improvements.