Dennis Rivera Burgos

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EDUCATION

Texas Tech University — Lubbock, Texas
Bachelor of Science in Computer Engineering, ***GPA: 3.24*** — Spring 2026

WORK EXPERIENCE

Predictive Monitoring Systems — San Pedro Sula, Honduras
Execution Coordinator — December 2023 - January 2024

- Designed a responsive, user-friendly interface for real-time monitoring data.
- Collaborated in creating maintenance calendars and coordinated company visits.
- Performed mechanical vibrations, thermographic analyses, and aided in borescope inspections.

PROJECT EXPERIENCE

Autonomous Logistics Rover System – FPGA-Based Robotics

- Built autonomous rover on Artix-7 FPGA (Basys 3). Implemented Verilog modules for TCS3200 color sensing, PWM motor control, inductive line following, IR inter-system communication, and servo-controlled object manipulation with deterministic state sequencing.

RTOS-Driven Smart Hydroponics Controller – Embedded Systems

- Developed plant automation system on STM32L476 with custom cooperative RTOS in C. Implemented soil moisture sampling, pump actuation, WS2812B LED control, UART telemetry, and INA219 power monitoring with overcurrent protection. Built ESP32 JSON dashboard for live monitoring.

RaiderForge CoreXY Motion Platform – Embedded Firmware (Current)

- Designing custom CoreXY 3D printer on STM32 Nucleo L4. Implementing inverse kinematics, synchronized dual-stepper control, two-stage endstop homing, thermistor signal conditioning, MOSFET heater control, and closed-loop PID temperature regulation with safety interlocks.

Automated Poultry Security Platform – Electromechanical Systems

- Built automated coop with Raspberry Pi integrating linear actuators, H-bridge motor control, PIR sensing, and RFID/OpenCV counting. Implemented automatic door operation, predator deterrent systems, event logging, and manual override with modular Python architecture.

Real-Time Reconnaissance Rover – Embedded Networking

- Built browser-controlled rover on Raspberry Pi Zero 2 W. Implemented Flask server for JSON commands mapped to GPIO via TB6612FNG H-bridge. Designed low-latency video pipeline using GStreamer and MediaMTX with separated control/video paths.

Playing Card Recognition System – Computer Vision

- Implemented real-time card detection using OpenCV. Developed pipeline with adaptive thresholding, contour filtering, perspective warping, and template-matching classification with confidence gating. Optimized with threaded video capture.

AFFILIATIONS

Texas Tech University — Lubbock, Texas
Member
Hispanic Student Society — Fall 2024-Spring 2026

Member
Society of Hispanic Professional Engineers — Fall 2024-Spring 2026

RELEVANT COURSEWORK AND SKILLS

- **Languages:** English (Native/Bilingual), Spanish (Native/Bilingual)
- Programming Languages: C++ (Proficient), Python (Proficient), C (Proficient), Java, Verilog, Arduino, Assembly
- Tools: Microsoft Office, CubeIDE, Code Composer Studios, Platform IO, Vivado, Linux