ROBERTO CRUZ

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EDUCATION

Texas A&M University | College Station, TX | Expected May 2028

B.S., Multidisciplinary Engineering Technology | Mechatronics track

Minor: Embedded System Integration | Regents' Scholarship recipient, August 2024

Relevant coursework: Microcontroller Architecture, Analog Electronics, Digital Logic Fundamentals, Embedded Systems Concepts, Dynamic Systems, Static Systems & Internal Loads, Material Properties (ANSI Standards).

YES Prep North Central Secondary | Houston, TX | Graduated June 2024

TECHNICAL SKILLS

Programming: C, Python, TypeScript, MATLAB (including Simulink)

CAD & Simulation: SolidWorks, Fusion 360, Multisim, Quartus Prime, Blender

Electronics: Analog circuit design, soldering, embedded systems, digital logic, FPGA (VHDL)

Other tools: Git, SQL | **Languages:** English and Spanish (native or bilingual proficiency)

Training: MathWorks Simulink Onramp, August 2026

License: Texas Landscape Irrigator (TCEQ), issued August 2025; expires August 2028

PROJECTS

FPGA PWM Duty-Cycle Controller | November 2025

- Partnered on a two-person team to design a controller on an Intel MAX 10 FPGA (Terasic DE10-Lite); jointly developed a Moore state diagram before implementation in VHDL and Quartus Prime schematic capture.
- Built next-state logic, the count-value block, and BCD-to-seven-segment decoding for the live duty-cycle display; reviewed and corrected logic errors in the PWM output block.

Analog Intrusion Alarm | March-April 2026

- Built a working Velleman MK120-based alarm on a two-person team; independently developed a Multisim simulation to debug the circuit beyond assignment requirements.
- Diagnosed faults with a multimeter and oscilloscope, validated the circuit on a breadboard, and soldered most of the final assembly.

Dexterous Robotic Hand | February-April 2026

- Contributed to a four-to-five-person team developing an 11-servo, tendon-actuated hand with independent finger bend and splay plus wrist motion, within an eight-week timeline and $100 budget.
- Built full Fusion 360 assemblies, simulated joint motion to check range and interference, and designed and 3D printed finger and joint parts.

Autonomous Warehouse Robot | March-May 2026

- Led chassis design and developed the full SolidWorks CAD assembly and motion simulation on a three-person team building a warehouse robot within a 40 x 40 x 40 cm resting envelope.
- Wrote early movement pseudocode, contributed to REV Control Hub block programming, and debugged Raspberry Pi 4 Python control code using time-of-flight and color sensors.
- Demonstrated manual driving. Autonomous navigation and color sorting were not finalized; lift reliability problems limited full-system testing.

OverEngineered: Engineering Sandbox Game | December 2025-present

- Continue development of an abandoned open-source Roblox engineering sandbox in TypeScript (roblox-ts); create Blender models and decals and integrate SQL-backed persistence.
- Maintain version control with Git across a collaborative repository with multiple forks.

WORK EXPERIENCE

Landscape Irrigator - Self-employed | Houston, TX | June 2024-present (seasonal)

- Plan residential irrigation layouts for coverage, efficiency, and site constraints; install and repair piping, sprinkler heads, valves, and controllers, including watering schedules.
- Explain system operation, recommend repairs, and adjust designs with clients.

CLEN 181 Peer Mentor - Texas A&M University | College Station, TX | August-December 2026

- Mentor 16 first-year engineering students in a paid role; co-facilitate a weekly transition-to-college seminar with a faculty instructor and meet individually with mentees for academic and campus-resource guidance.

LEADERSHIP & INVOLVEMENT

IEEE - Member, September 2026-present | TAMU ASME-Tech - Member, September 2025-present

Galveston Engineering Student Organization - Member, 2024-2025

Science National Honor Society - YES Prep North Central Secondary