

Nathaniel Cavazos

Mechanical Engineer Student

Mechanical Engineering Student interested in controls engineering, industrial automation, and embedded systems.

CONTACT

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EDUCATION

California State University, Long Beach | Long Beach, CA Expected May 2028 | GPA: 3.57

B.S. Mechanical Engineering

Relevant Coursework – Engineering Design, Computer Methods, Statics, E&M, Applied Math, Manufacturing Processes, Dynamics

WORK EXPERIENCE

Cafeteria Team Member | Delano High School, Delano, CA

Apr 2023 – Jan 2025

- Collaborated with a team of 15 staff to efficiently serve 1,200+ high school students daily in a high-volume, fast-paced environment.
- Coordinated food preparation and distribution to ensure timely service during peak lunch periods.
- Lead a team of 4 to manage inventory restocking and food preparation, maintaining continuous and organized service flow.

ENGINEERING PROJECTS

Embedded Communication Groundstation (STM32-based)

Jan 2026 – Apr 2026

- Designed and built a Simulink-based communication system with an SPI pipeline between a Nucleo F103RB and ESP32-C3-Supermini, supporting bi-directional 16-byte packet transmission.
- Implemented ESP-NOW wireless protocol for low-latency, connectionless data transmission between embedded nodes.
- Integrated USB serial telemetry for live data visualization and logging via a Simulink scope, enabling real-time monitoring and onboard data storage.

Water Tank PLC Simulation

Apr 2026 – May 2026

- Designed a PLC-based automated water tank system simulation using an Allen-Bradley PLC with integrated Panel-View.
- Used CCW and Rockwell Automation products to create ladder logic for PLC.
- Connected PLC and Panel via Ethernet through RSLinx and BOOTP to configure IP.
- Integrated emergency stop buttons on each screen of the HMI to prioritize safety and prevent catastrophic failure. Also includes alarms and fault testing.
- Digital outputs on the PLC to simulate enabling and disabling of the pump and drain.

Cycloidal vs. Planet vs. Harmonic Drives Study

May 2026 – Present

- Designing and manufacturing all three drives using a 3D printer on Siemens NX.
- Using a 20kg load cell and a NEMA-17 stepper motor to measure the torque of each drive.
- Optimizing each drive and determining the optimal torque model for future projects.

TECHNICAL SKILLS

CAD/CAE: Solidworks, Siemens NX, MATLAB/Simulink

PCB Design: KiCad

Embedded: STM32, ESP32, Logic Gates, Sensor Integration, SPI, UART, I2C

Engineering Software: Automation, Ignition, Common Components Workbench, RSLinx, BOOTP