Cristian Robles, Computer Engineering Graduate Student

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EDUCATION

Masters of Science, Computer Engineering, May 2026
California State University Northridge

COURSES

Robotics and Embedded Systems, FPGA Design, Computer Architecture, Linear Systems, Digital Systems, Digital Electronics, Microprocessor Systems, System on Chip Design, Probability, Data Structures, Differential Equations, Linear Algebra

SKILLS

C, C++, Assembly, SPI, I2C, UART, PID Control, Kalman Filters, RTOS, FPGA, VHDL, ROS, NASA F' (Flight Software Framework), Linux, Git, GitHub, Matlab, Simulink, Vivado, Solidworks CAD, 3D Printing, OrCAD PSpice, Leadership

PROJECTS

TI-RSLK Robot Control

- Developed and fine-tuned a PID control algorithm using the TI RSLK robot and MATLAB, optimizing motor movement and navigation performance.
- Integrated PWM motor control and encoder feedback within the embedded system using Simulink to tune the control system for speed regulation and real-time position tracking for autonomous operation.

F Prime Embedded Systems Development

- Designed and programmed a mobile robot using NASA's F′ (F Prime) flight software framework to send commands from ground data system (GDS) to onboard hardware via I2C communication.
- Developed custom F′ components to control motors and control GPIO, enabling real-time robotic movement.

Kalman Filter Simulation

- Developed and implemented linear Kalman filters in C++ to fuse simulated sensor data, achieving enhanced accuracy in position, speed, and acceleration measurements.

EXTRACURRICULAR ACTIVITIES

Aug 2019 — May 2023 **Team Lead, CSUN Vex Robotics** Northridge

- Engineered C++ code for self-navigating robots, integrating algorithms including PID control, pure pursuit path tracking, and odometry for spatial awareness.
- Utilized the RTOS functionality of the VEX microcontroller for real-time task scheduling and concurrent execution of sensor readings, motor control, and autonomous routines.
- Modeled and manufactured multiple mechanical subsystems for competition robots using SolidWorks CAD software, leveraging 3D printing and CNC machining for prototyping and final assembly.

Aug 2021 — May 2022 **President, CSUN Vex Robotics** Northridge

- Successfully managed the club during the transition period as school resumed in-person activities following the COVID lockdown.
- Acted as the team representative in school budget meetings, effectively communicating the team's needs and advocating for necessary resources resulting in a funding increase for robotics supplies.
- Mentored individuals of all skill levels in robotics concepts through hands-on instruction.

Jan 2023 — Dec 2023 **Systems Subteam Member, CleanBot 3000 (Senior Project)** Northridge

- Employed ROS2 for automation of a sanitization robot for NASA's Jet Propulsion Laboratory's clean rooms, integrating technologies like SLAM, serial communication, PID control, and path planning.
- Collaborated on building a network using a Raspberry Pi and an Ubuntu Server Linux distribution for robotic control in ROS2.
- Leveraged diagnostic tools including a logic analyzer, oscilloscope, and multimeter to troubleshoot and refine various electronic components, reducing operational downtime.