

Colton Acosta

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EDUCATION

B.S.E, Electrical Engineering; Controls Emphasis
Arizona State University, Tempe, AZ

Graduating May 2023
4.00 GPA

TECHNICAL SKILLS

Design/Modeling: MATLAB/Simulink, LTspice, KiCAD, DipTrace, Cadence

Software: C, C++, Python, Assembly, Linux, Git, Make, ARM, Visual Studio

Hardware: Verilog, Microcontrollers, FPGA, Soldering (SMD), Multimeters, Oscilloscopes

PROFESSIONAL EXPERIENCE

Garmin Aviation: Software Engineering Intern

May 2022–August 2022

- Developed certification software for a new Vulkan graphics driver to be used in safety-critical avionics systems
- Wrote unit tests with randomized test vectors in C to test the GPU driver source code with maximal coverage
- Debugged compiler errors of ARM and Windows builds using Visual Studio and MSBuild XML schemas
- Resolved runtime errors caused by randomized test vectors by analyzing the source code functions and manually setting up data structures, pointers, arrays, and buffers

Sun Devil Rocketry: President and Avionics Team Founder

August 2021–May 2022

- Oversaw all activities of a technical student organization with three rocket propulsion teams, two amateur rocketry teams, a K-12 outreach program, and over 50 members
- Facilitated all project development by holding meetings and design reviews, writing budget proposals, organizing launch logistics, mentoring, and maintaining industry/university relations
- Founded a new avionics team to design the club's first flight computer and promote the development of electrical and software engineering skills among students interested in the aerospace industry

Pyramid Technologies, Inc, Mesa, AZ: Electrical Engineering Intern

May 2021–August 2021

- Evaluated bill validation errors of a bill acceptor's firmware using an in-circuit debugger and assembly source code
- Wrote Python scripts to calculate external component design values from input specifications and datasheet guidelines

PROJECTS

Flow Control Valve Actuator Control System

Fall 2020

- Designed and built a closed loop control system for a valve actuator for use in flow throttling applications
- Examined the relationship between Pulse Width Modulation duty cycle and steady state shaft speed to derive a controller output signal with a linear transfer function from controller output to shaft position
- Characterized the plant transfer function with a series of step response experiments
- Implemented a saturated PI controller with integrator clamping in C++, and simulated the performance using Simulink to meet specifications of zero steady state error of step inputs and complete rejection of step disturbances
- Built the actuator using a brushed DC motor, coupling shaft, Arduino, and quadrature rotary encoder for feedback

Sun Devil Rocketry: Flight Computer

January 2021–Present

- Developing a flight computer for high-powered rockets to implement recovery, control, and telemetry functionality
- Equipped the embedded computer with an ARM Cortex-M7 microcontroller, a 9-axis IMU, GPS, a LoRa wireless module, a micro SD card, external flash, and a USB interface
- Programmed the computer with C for low level control of the microcontroller's UART, I2C, SPI, and GPIO peripherals

Sun Devil Rocketry: Engine Controller

August 2019–Present

- Developing a controller for a liquid rocket engine to manage engine hardware and automate ignition sequencing
- Designed the PCB using an ARM Cortex-M7 microcontroller, a switching power supply, external flash, an SD card, ignition terminals, sensor peripherals, a USB interface, and a wireless command and control interface
- Developed ignition and data-logging APIs in C to abstract low-level hardware control functionality
- Programmed a Python interface for real-time visualization of temperature, pressure, thrust, and flow measurements