

# Colton Acosta

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## EDUCATION

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**B.S.E, Electrical Engineering**  
Arizona State University, Tempe, AZ

Graduating May 2023  
4.00 GPA

## TECHNICAL SKILLS

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**Software:** C, C++, Python, GCC Assembler, Linux, Git, Make, ARM Cortex-M, Vulkan

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

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

## PROFESSIONAL EXPERIENCE

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### Garmin Aviation: Embedded 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 fuzz tests with randomized test vectors in C to test GPU driver source code with maximal coverage
- Debugged compiler errors of ARM and Windows builds using Visual Studio and MSBuild XML schemas

### 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
- Qualified new optocouplers by measuring logic levels and slew rate for ambient temperatures ranging from 0 to 60°C
- Wrote Python scripts to calculate external component design values from input specifications and datasheet guidelines

## PROJECTS

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### 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 and assembly for low level control of the microcontroller's 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
- Programmed the controller with C and assembly using for low level control of the microcontroller's peripherals
- Programmed a Python interface for real-time visualization of temperature, pressure, thrust, and flow measurements
- Amplified pressure transducer differential outputs to measurable ranges using a programmable amplifier circuit in order to save upwards of 10% of club funding in new sensor costs

### Sun Devil Rocketry: Valve Controller

Spring 2022

- Designed, built, and tested a controller to actuate rocket engine valves using an ARM Cortex-M7 microcontroller, solid state relays, a pulse interface, and motor sensors.
- Calibrated valve shaft initial positions using an optoelectronic photogate sensor with customized form factor
- Designed an optically-isolated voltage monitoring circuit to alert the controller when solenoid power is lost
- Programmed the controller in C to process valve actuation commands from the main engine controller