Colton Acosta

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EDUCATION

B.S.E, Electrical Engineering Graduating May 2023
Arizona State University, Tempe, AZ 4.00 GPA

TECHNICAL SKILLS

Modeling/Sims: MATLAB/Simulink, LTspice, KiCAD, DipTrace, Cadence
Software: C, C++, Python, Assembly, Linux, Git, Make, ARM Cortex-M, Visual Studio
Hardware: Verilog, Microcontrollers, FPGA, Soldering (SMD), Multimeters, Oscilloscopes, Function Generators

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

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

Valve Actuator Flow 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 a quadrature rotary encoder for feedback

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

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
- Programmed the controller in C to process valve actuation commands from the main engine controller
- Developed a solenoid control API in C to implement basic solenoid actuation functions to simplify the application code