Colton Acosta

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SUMMARY

Junior aerospace engineering student with leadership and collaborative project experience including work in statistics, computer-aided design and modeling, programming, specification development, and electronics. Open to relocation.

EDUCATION

B.S.E, Aerospace Engineering; Autonomous Vehicle Systems   Graduating May 2022
Arizona State University, Tempe, AZ   4.00 GPA

TECHNICAL SKILLS

Presentation and Organization: Microsoft Office, LaTeX
Design and Modeling: MATLAB, Simulink, SOLIDWORKS, LabVIEW
Programming: Python, C, C++, R, Linux (git, vim, gcc, gdb)

PROJECTS

Team Lead, Airfoil Statistics Project   Spring 2020

- Lead a group of seven students to complete a semester long project by devising a project plan, delegating workloads, setting timelines, and scheduling team meetings
- Collected computational aerodynamic data with Ansys for airflow over a wing section with configurable design specifications created with SOLIDWORKS from a NACA 2412 airfoil parameterization
- Used R programming to analyze data with an Analysis of Variance test and to compute significance-based regression models for wing section lift and drag response to chord length, angle of attack, and sweep angle factors

Orbital Mechanics Trans-lunar Injection Simulation   Spring 2019

- Simulated a free-return, trans-lunar injection orbital trajectory in MATLAB with an animated solution
- Calculated the trajectory by solving the two-body problem using a numerical differential equation solver built from scratch with Apollo 11 low earth orbit initial conditions

EXPERIENCE

Liquid Propulsion Avionics Lead, Sun Devil Rocketry   August 2019-Present

- Leading the design and development of an avionics system for a liquid rocket engine with over 20 hardware components including valves, transducers, thermocouples, load cells, controllers, and signal processing circuitry
- Interfacing temperature, pressure, thrust, and flow measurements with a Python graphical user interface
- Conducting trade studies on electronic actuators and orifice flow meters to develop main propulsion system specifications using MATLAB for multivariate trade-off analyses and physical modeling
- Programming AVR microcontrollers with C for prototype testing of the engine's embedded systems including data acquisition, actuation, flow control, and communications functionality
- Wrote a C++ program to generate Gaussian noise for hardware filter testing by writing an algorithm for computing values of an inverse Gaussian cumulative distribution function
- Wrote a C program to encode the state of the engine's valves using bit operators for efficient serial data transmission
- Built an instrumentation amplifier circuit using operational amplifiers to boost sensor outputs to measurable ranges resulting in hardware savings upwards of $200
- Building a central telemetry system using RS-485 electrical interfaces for long distance and noise insensitive serial communications between data acquisition, valve control, and main controllers
- Designed and built a second order, active low-pass filter and tested the filter's noise reduction and signal reproduction by adding noise to a measured signal with a voltage summing circuit
- Documented project progress in published AIAA Propulsion and Energy conference paper
- Wrote a development plan for the 2020-2021 academic year consisting of 42 deliverables to document project milestones, cultivate a results-oriented work environment, and delegate workloads among new talent