RYAN ROCHA

Graduate Student Researcher

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EXPERIENCE

University of California, Davis

Graduate Student Researcher

September 2017 – Present Davis, CA

- Produced computer vision detection and tracking algorithms using OpenCV, Python, C++, and Kalman filtering
- Programmed autonomous navigation algorithms for multi-rotor drones by interfacing with the PX4 flight stack using ROS, Python, and C++
- Developed an autonomous in-flight multi-rotor drone docking simulation in Gazebo
- Tested computer vision based autonomous navigation, guidance and control algorithms on a custom designed and 3D printed drone

Undergraduate Student Researcher

March 2017 – September 2017

- Served as a team lead for the development of a dynamic maintenance procedure programmed in JavaScript used to help astronauts complete tasks in which they have no prior training
- Built an aluminum apparatus using SolidWorks and conventional machining techniques in order to test an individual's aptitude with various tool skill sets

Integrated Comfort Incorporated - ICI

Mechanical Engineering Summer Intern

June 2017 – September 2017 Sacramento, CA

- Extensively used SolidWorks to design and update parts used in air conditioning system retrofits
- Designed, ordered and installed a custom evaporative pre-cooler for an air conditioning unit

Western Cooling Efficiency Center - WCEC

Student Engineering Researcher

June 2016 – June 2017 Davis, CA

- Constructed and verified large building energy consumption simulations

Student Engineering Assistant

October 2014 – June 2016

- Developed real-time and post-processing data analysis programs using Python in a Linux environment for a variety of data types
- Assisted in the planning and installation of various thermodynamic system retrofits
- Wrote and reviewed official interim reports that pertained to several research topics

National Aeronautics and Space Administration - NASA

Aerospace Engineering Summer Intern

3 summers: 2014 – 2016 Mountain View, CA

- Processed Computational Fluid Dynamics (CFD) simulation results for NASA's Space Launch System using Python, Perl and MATLAB in a Linux environment to optimize data organization and visualization techniques
- Generated overset structured grids on various parts of the Space Launch System for use in CFD simulations using Tcl and NASA-developed gridding software

EDUCATION

M.Sc. in Mechanical & Aerospace Engineering

University of California, Davis

September 2017 – June 2020 (Expected)

- **Publication:** Rocha, Ryan, and Stephen K. Robinson. "Toward Autonomous In-flight Docking of Unmanned Multi-rotor Aerial Vehicles." AIAA Scitech 2020 Forum. 2020.
- GPA: 3.62

B.Sc. in Mechanical Engineering

University of California, Davis

September 2012 – March 2017

- Major GPA: 3.50

B.Sc. in Aerospace Engineering

University of California, Davis

September 2012 – March 2017

- Major GPA: 3.63

SKILLS

Languages: Python, C++

Tools: ROS, OpenCV, Gazebo, Git

Additional: Linux, PX4, SolidWorks, 3D Printing, MATLAB, Simulink, LaTeX

HONORS & AWARDS

- Recognized in the group achievements of the NASA Ames SLS CFD Team
- CFD data visualization work publicized in the article "Simulating SLS Booster Separation" on nasa.gov
- Repeated recipient of Dean's List award for achieving a GPA within the top 16 percent of the College of Engineering

ADDITIONAL

- PX4 community volunteer
- FAA Remote Pilot Certification holder
- Volunteering with planning and running STEM related events for fifth and sixth grade students with low income and English learner backgrounds
- Employed as a teaching assistant for a system engineering course on satellites and a thermodynamics lab