

# RYAN ROCHA

## Graduate Student Researcher

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## EXPERIENCE

### University of California, Davis

#### Graduate Student Researcher

📅 September 2017 - Present    📍 Davis, CA

- Programmed autonomous control algorithms for multi-rotor drones by interfacing with the PX4 flight stack using ROS and Python
- Produced computer vision detection and tracking algorithms using OpenCV, Python and state estimation
- 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 built drone

#### Undergraduate Student Researcher

📅 March 2017 - September 2017

- Served as a team lead for the development of a dynamic maintenance procedure 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 Unix 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 - December 2019 (Expected)

- Thesis: Toward Autonomous In-flight Docking of Unmanned Multi-rotor Aerial Vehicles
- Research and course emphasis in robotics and controls
- 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

- 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