Josh W. Day

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Education

University of California, Davis *2020*

M.S. Mechanical and Aerospace Engineering

- Thesis: *Development of a Two-Fault Tolerant Cold Gas Propulsion System and Air Bearing Testbed for Application to a Spacecraft-Inspection CubeSat*

University of California, Davis *2013*

B.S. Mechanical Engineering, B.S. Aerospace Science & Engineering

Publications

Josh W Day and Stephen K Robinson. Two-Fault Tolerant Cold Gas Propulsion System for Spacecraft-Inspection CubeSat. page 1665, 2020. DOI: https://doi.org/10.2514/6.2020-1665

Experience

Human/Robotics/Vehicle Integration & Performance Lab *Jun 2016 – Oct 2020*

- Constructed small satellite propulsion system testbed using air bearings and 3D printed components to simulate microgravity conditions, enabling highly repeatable motion measurements at low cost.
- Implemented Python + OpenCV-based computer vision tracking system to measure air bearing platform motion and utilized Kalman filtering to extract acceleration data for accurate vision-based thrust measurement.
- Developed full stack human-machine interface using JavaScript + Arduino for real-time wireless control, relaying and recording data, and measuring propulsion system performance.

UC Davis Department of Mechanical & Aerospace Engineering *Jan 2018 – Jun 2019*

- As lead TA, assisted with lesson plan development and task delegation, and supervised up to three bi-weekly lab sessions consisting of 6 teams of 4 students, each with their own individual project needs.
- Applied experience with programming, sensors, and actuators to introduce students to data collection with microcontrollers and guide team projects to address problems identified on the UC Davis Student Farm.
- Provided effective feedback to students engaged in public speaking and presentions, citing noteable improvement in student communications skills from beginning to end of quarter.

NASA Jet Propulsion Laboratory *Jun 2018 – Aug 2018*

- Designed hardware testing components and provided sensor recommendations for launch vibration testing of flight-like hardware for the Mars 2020 Sample Caching Subsystem.
- Assembled and calibrated a custom high-precision benchtop dynamometer for motor testing and drafted corresponding documentation to be made available for use by other JPL engineers.
- Collaborated with senior engineers to design and execute assembly procedures for parts to be flown on the Mars 2020 rover, personally handling and successfully delivering flight hardware components.

NASA Jet Propulsion Laboratory *Jan 2017 – Aug 2017*

- Assisted with performance testing of flight-like motors and actuators in extreme temperatures and helped to design and lead special testing to uncover cause of premature gearbox degradation.
- Supported R&D on the proposed Mars Sample Return mission with trade studies and conceptual design development for a robust latching system and alignment/release mechanism.
- Developed Python and MATLAB-based data analysis tools to visualize motor performance test data and generate test summaries to be delivered directly to supervising engineers.

Technical Skills

CAD/CAM	SolidWorks | NX 11 | Slic3r | BobCAM | ESPRIT
Manufacturing	Lathing | Milling | 3D Printing | Printed Circuit Boards
Programming	Python | C++/Arduino | MATLAB | JavaScript/HTML/CSS
Development	Git | Linux/WSL | VS Code

Awards and Certifications

- Tau Beta Pi Engineering Honor Society Member, California Lambda Chapter
- EIT/FE (California), Certification No. EIT 146122
- Eagle Scout, Boy Scouts of America