

EDUCATION

M.S. MECHANICAL AND AEROSPACE ENGINEERING

University of California, Davis – 2020

- Thesis: *Development of a Two-Fault Tolerant Cold Gas Propulsion System and Air Bearing Testbed for Application to a Spacecraft-Inspection CubeSat*, [available online](#).

B.S. MECHANICAL ENGINEERING

University of California, Davis – 2013

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

Graduate Student Researcher

- 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 of propulsion system and real-time feedback from sensors.

UC DAVIS DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

Sep 2015 – Jun 2019

Teaching Assistant (Various Courses)

- Engineering Design & Communications* – As lead TA, assisted lesson plan development, gave weekly lectures introducing students to sensors and microcontrollers, and provided critical feedback on public speaking and technical communication.
- Measurement Systems* – Supervised weekly lab sessions introducing students to electro-mechanical sensors such as op-amps and strain gauges to measure bending stress and accelerometers to identify vibrational modes.
- Manufacturing Processes* – Instructed students on safe operation of manual fabrication equipment and proper use of geometric dimensioning and tolerancing, leading each student in the construction of their own personalized gyroscope.

NASA JET PROPULSION LABORATORY

Jun 2018 – Aug 2018

Mechanical Engineering Intern

- Designed components to emulate mass properties of flight hardware and provided sensor recommendations for launch vibration testing of components for the Mars 2020 rover Sample Caching Subsystem.
- Assembled and calibrated a customized benchtop dynamometer to be used for motor/actuator performance testing, documenting assembly process and providing recommendations for improvement to supervising engineer.
- Developed procedure and supervised assembly of epoxy-bonded aluminum honeycomb shock dampers, personally handling and successfully delivering the hardware which was flown on the Mars 2020 Perseverance rover.

NASA JET PROPULSION LABORATORY

Jan 2017 – Aug 2017

Mechanical Engineering Co-op

- 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 SOFTWARE	SOLIDWORKS NX 11 SLIC3R BOBCAM ESPRIT
MANUFACTURING EXPERIENCE	CNC LATHING / MILLING / ROUTING 3D PRINTING (FDM) PRINTED CIRCUIT BOARDS
PROGRAMMING LANGUAGES	PYTHON C++ / ARDUINO MATLAB JAVASCRIPT HTML CSS
DEVELOPMENT TOOLS	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