

Dhruv Jain

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Objective: Looking for an opportunity to leverage my Aerospace Engineering experience with dynamics modeling, numerical methods, trajectory optimization, 3D visualization, space systems and software development to solve hard and exciting engineering problems.

Education:

Purdue University, West Lafayette, IN, USA

- **Master of Science** in Aeronautical & Astronautical Engineering, Astrodynamics and Controls May 2023
Advisor: Kathleen Howell, Multi-Body Dynamics Research Group
Thesis: Leverage Quasi Periodic Orbits (QPOs) in the Circular Restricted Three Body Problem to design transfer trajectories between periodic orbits in the cislunar space **GPA: 4.00/4.00**
- **Bachelor of Science** in Aeronautical & Astronautical Engineering, Minor in Astronomy Dec 2020
Focus: Dynamics & Controls, and Design **GPA: 3.97/4.00**

Technical Skills: Python (numpy, plotly, matplotlib), Linux, Git, Command Line Interface, MATLAB, SIMULINK, C++, C, Freeflyer, STK, GMAT, CATIA V5, MS Office Suite, Asana, Trello, Slack, Teams

Engineering Projects:

Multibody-Dynamics Research Group, Prof. Kathleen Howell, Purdue University Jan 2021 - Present

Graduate Researcher

- Leveraged numerical methods and Python to compute 100+ periodic orbit and quasi-periodic orbit families using the Circular Restricted Three Body Problem in the cislunar space
- Exploited manifolds, Poincare maps and k-d tree to compute fuel-optimal transfer trajectories between periodic orbits and analyzed their performance
- Developed software using Python, Command Line Interface and Git to make part of the code public ([1](#), [2](#))
- Honed my communication skills to clearly report complex independently developed results

Senior Spacecraft Design Project, Prof. James Garrison, Purdue University Aug 2020 – Dec 2020

Systems Engineer

- Collaborated with 8 peers to develop a satellite constellation mission with Signals of Opportunity technology payload to collect sub-soil moisture data
- Formulated top-level requirements, carried out and analyzed coverage and revisit calculations of satellite constellation with various P, I and L band receiver satellites using MATLAB and Python
- Identified margins, risks, development approach and flight software requirements
- Ideated with all the team members to realize various aspects of space mission design ranging from mission operations and communication to structure and propulsion
- Ensured timely communication of the evolving designs and data to the different sub systems teams

Dhruva Space, Hyderabad, India Jun 2020 – Aug 2020

Spacecraft Dynamics and Control Systems Intern

- Designed and built an attitude dynamics simulator software for CubeSat in Python by using OOP principles for software-in-the-loop testing
- Simulated passive magnetic attitude control to analyze simulated results to size the necessary hardware
- Interfaced with another intern to oversee the implementation of sensor models and Unscented KF algorithm

Aerodynamic Deorbit Experiment, Prof. David Spencer, Purdue University Jan 2019 – May 2019

Undergraduate Research Assistant

- Orbit Modeled and ran Monte-Carlo Analysis for 10,000+ cases in FreeFlyer by interfacing with MATLAB to compute and analyze CubeSat lifetime and ground station contact time for variable right ascension of ascending node, epoch, coefficient of drag and solar radiation pressure area.
- Developed a function in C to interface flight software with IMU in Linux environment using Raspberry Pi
- Gained insights into mission design challenges and improved technical communication