DIVESH SONI

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LinkedIn — Google Scholar

SUMMARY

Ph.D. researcher and aerospace engineer with 7+ years of experience spanning ISRO, NASA JPL, and Caltech. Specialized in deployable and flexible space structures, multi-body dynamics, and actuator–structure interaction. Strong background in simulation-to-test correlation, prototyping with Arduino and synchronous tracking with DC motors. Seeking R&D roles in space systems, robotics, and mechanism design.

EDUCATION

California Institute of Technology (Caltech)   Pasadena, CA
M.S. in Space Engineering   2022
GPA: 4.1 /4.2

Indian Institute of Space Science and Technology (IIST)   Trivandrum, India
B.Tech in Aerospace Engineering   2016
GPA: 9.05 / 10.00 — Department Rank: 2

RESEARCH EXPERIENCE

Graduate Student – Space Structures Laboratory   2022 – Expected May 2026
California Institute of Technology   Pasadena, CA

- Designed Pyramid Control Moment Gyroscope cluster prototype

- Developed experimental procedure to perform slew maneuvers with gravity compensation

- Established 3-axis stabilization and trajectory tracking in attitude on Teensy 4.1

- Fabricated test structure for studying flexible body deformations

- Data driven model identification and control (ongoing)

PROFESSIONAL EXPERIENCE

Scientist – Spacecraft Mechanisms Group   2016 – 2021
Indian Space Research Organization (ISRO)   Bangalore, India

- Performed structural analysis of spacecraft mechanisms for GEO and LEO missions, including solar arrays and large reflector systems.

- Modeled pulley-based closed control loops (CCLs) enabling synchronized deployment of foldable appendages.

- Built failure models and performed Design of Experiments (DOE) studies for spacecraft docking to identify safe capture envelopes.

- Supported mission operations by analyzing on-orbit telemetry for mechanical appendages across multiple flight missions.

Summer Intern – Jet Propulsion Laboratory (NASA)   Summer 2015
Pasadena, CA

- Developed an active vibration control model for an externally excited mechanical system using Macro Fiber Composite (MFC) actuators.

- Identified system parameters and control laws using reduced-order (SDOF) modeling techniques.

- Performed experimental validation using piezoelectric sensors and laser vibrometry.

- Conducted thermal characterization of MFC actuators using mid-wave infrared imaging under varying voltage and frequency inputs.

TECHNICAL SKILLS

Programming: Python, MATLAB, C++
Simulation & Analysis: Abaqus, MSC Nastran, ADAMS
Dynamics & Controls: Multi-body dynamics with flexible structures, actuator–structure coupling, Design of Experiments
Tools: Platform IO, LaTeX, Microsoft Office

PUBLICATIONS

- Soni, D., Gdoutos, E., Pellegrino, S., "Experiments with a Momentum Exchange Actuator for Ultralight Flexible Spacecraft," SciTech, AIAA, 2026.

- Soni, D., Issac, K., et al., "Design and Analysis of Mesh-Based Deployable Reflectors," ARMS, 2016.

- Rai, V. S., Soni, D., "Dynamic Simulation Studies for On-Orbit Spacecraft Docking," ARMS, 2018.

TEACHING EXPERIENCE

Teaching assistant at Caltech for graduate level courses

- Ae103a Aerospace Control Systems, Fall 2023-2024

- Ae105b Space Engineering, Spring 2024-2025

LEADERSHIP & SERVICE

- Organized laboratory outreach tours for Southern California Science Olympiad students at Caltech.

- Mentoring first-year Caltech undergraduate for practicing research

- Core designer for IIST Aerospace Club magazine; organized hands-on aerospace workshops.