

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

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| 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

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| Graduate Student – Space Structures Laboratory | 2022 – Expected May 2026 |
| <i>California Institute of Technology</i> | 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

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| Scientist – Spacecraft Mechanisms Group | 2016 – 2021 |
| <i>Indian Space Research Organization (ISRO)</i> | 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)
Pasadena, CA

Summer 2015

- 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, flexible structures, actuator–structure coupling, DOE

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.

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.