DIVESH SONI

Pasadena, California
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EDUCATION

California Institute of Technology Jun 2022 - Present
Ph.D. in *Space Engineering* *Pasadena, CA*
Pursuing research in the field of flexible body dynamics and control.

California Institute of Technology Sep 2021 - Jun 2022
M.S. in *Space Engineering* *Pasadena, CA*
CGPA: 4.1/4.2
Selected Coursework: Solids + Controls

Indian Institute of Space Science and Technology July 2012 - May 2016
B.Tech in *Aerospace Engineering* *Kerala, India*
CGPA: 9.05/10.00
Department Rank: 2
Selected Coursework: Kinematics and Dynamics of Mechanisms, Aerospace Structures-I & II, Multi Disciplinary Design Optimisation, Finite Element Methods, Elastic Wave Propagation in Solids.

PROFESSIONAL EXPERIENCE

U.R. Rao Satellite Center, Indian Space Research Organization (ISRO) July 2016 - Aug 2021
Scientist, Advanced Mechanisms Section, Spacecraft Mechanisms Group *Bangalore, Karnataka, India*

Development of spacecraft payload systems with a primary focus on design of deployable mechanisms. Analysis of mechanical appendages to demonstrate margin and correlation with on-ground tests to establish proof of design.

- **Solid state reflectors and solar arrays :** Rigid body dynamics and modelling of sensitive details like mechanical pulley based close control loops(CCL's) for synchronous deployment.
- **Large Unfurlable Refector (6m) :** Flexible multi-body dynamic analysis. Major focus on modelling of mesh, system of rope and pulleys with the help of explicit dynamics in ABAQUS. Correlation with qualification model in large thermo-vacuum chamber with various sun angles and temperatures.
- **Spacecraft docking :** Developed ADAMS model for contact dynamics. Performed Design of Experiments study to determine safe system parameters for successful on-orbit capture. Ongoing work with machine learning to classify successful capture from a failed docking attempt and hence estimating a safe capture envelop for initial state vector.
- **Ground station support :** System health monitoring and data extraction of mechanical appendages for three GEO and two LEO missions.

Jet Propulsion Laboratory, NASA Jun 2015 - July 2015
Summer Intern *Pasadena, CA*

- Worked on active control of an externally excited mechanical system coupled with a Macro Fibre Composite (MFC) as the controlling element.
- **Objective :** Predicting model parameters and control of the continuous mechanical system with a single degree of freedom approximation.
- **Hardware Experience :** Kinetic measurements were done with the help of a piezoelectric transducer as well as a laser vibrometer. Worked with Mid-wave IR based thermal imaging system used to characterize the temperature of MFC actuators with Voltage and Frequency of combined system.

TECHNICAL STRENGTHS

Computer Languages	Python, Matlab
Tools	Abaqus, Nastran, Adams, *LaTex*, Microsoft Office

PUBLICATIONS

- Divesh S., Sohan K.Y.,K. Kurien I., 2016, *Design and analysis of Mesh based Deployable Reflector for Space Applications* National Symposium and Exhibition on Aerospace and Related Mechanisms(ARMS) [Preview]
- Vijay S. Rai, Divesh S., 2018, *Dynamic Simulation Studies for On-orbit Spacecraft Docking Experiment* National Symposium and Exhibition on Aerospace and Related Mechanisms(ARMS)[Preview]

ACHIEVEMENTS

- Member of Indian National Society for Aerospace and Related Mechanisms.
- Fully funded Bachelor's Level Studies by the Government of India - Merit Based Scholarship
- Fully funded internship at Jet Propulsion Laboratory, NASA by Government of India. (Merit + Interview based) [Memoir Document]
- Awarded "Outstanding" grade in four consecutive years during Annual Performance Review at Indian Space Research Organization.

CERTIFICATES/TRAININGS

- Machine Learning through Coursera. [Credentials]
- Neural Networks and Deep Learning through Coursera. [Credentials]
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization through Coursera. [Credentials]
- Convolutional Neural Networks through Coursera [Credentials]
- Introduction to Data Science in Python through Coursera. [Credentials]
- Department funded training on Abaqus/Explicit: Advanced Topics by Dassault Systems Bangalore, 2019
- Responsible Conduct of Research(RCR) Training for Students and Postdocs through CITI Program. [Credentials]

CO-CURRICULAR

- Member of Aerospace Club team at Indian Insitute of Space Science and Technology. Organized workshops like Light Glider, Hovercraft, Night Sky Lantern etc. Gained ideas of design basics and its scalibility to conduct workshops for the interested applicants.
- Core creative designer of Annual Aeroclub Magazine Udaan-Mach 2.0
- Represented college level badminton team during undergrad studies.