

Deven H. Mhadgut

Blacksburg, VA, USA

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Education

Virginia Tech (GPA: 4.0)

Blacksburg, USA

PH.D. IN AEROSPACE ENGINEERING

August 2021 - Present

- Advisor: Dr. Samantha Parry Kenyon
- Relevant Coursework: Vehicle Structures, Mechanical and Structural Dynamics, Model Reduction: System-theoretical methods

University of Colorado, Boulder (GPA: 3.81)

Boulder, USA

M.S. IN AEROSPACE ENGINEERING SCIENCES, FOCUS: STRUCTURES

August 2018 - May 2020

- Relevant Coursework: Non-Linear Finite Element Method, Large Space Structures Design, Mechanics of Aerospace Structures, Spacecraft Design

Sardar Patel College Of Engineering, University Of Mumbai (GPA : 3.59)

Mumbai, India

B.TECH IN MECHANICAL ENGINEERING

August 2014 - May 2018

- Relevant Coursework: Machine Design, Strength of Materials, Material Science, Heat and Mass Transfer, Fluid Mechanics, Mechatronics

Skills

Programming C++, \LaTeX , Arduino, Python

Softwares ABAQUS Standard/Explicit, ANSYS, SolidWorks, AutoCAD, CATIA, Matlab, Mathematica, Thermal Desktop, STK, Microsoft Office

Mfg. and Testing Shaker Table Testing, Laser Vibrometry, TVAC Testing, CNC Machining, Additive Manufacturing, Composites Manufacturing, GD&T (ASME Y14.5)

Experience

PhD Research, Center for Space Science and Engineering Research (Space@VT)

Blacksburg, USA

GRADUATE RESEARCH ASSISTANT

Oct 2021 - Present

- Worked on deployment and structural dynamics of a bistable composite boom onboard a 3U cubesat
- Performed modal analysis and deployment testing of the boom using laser vibrometry (impulse hammer and shaker tests)
- Implemented a reverse engineering approach using high-fidelity 3D scanning to improve modal analysis FEA models and their correlation with experimental data for thin deployable tapespring booms
- Thermal Vacuum and Shaker table testing of the satellite chassis to verify conformance to NASA environmental test standards
- Developed an experimental data-driven model to identify system dynamics and material parameters for characterizing system variability under different loading conditions

Virginia Tech

Blacksburg, USA

GRADUATE RESEARCH ASSISTANT

May 2025 - Present

- Assisted in establishing a vibration testing lab from the ground up, selected and purchased vibration equipment and sensors
- Designed experimental setups and test rigs for parametric modal analysis of beams and plates, set up data acquisition and analysis software
- Developed Standard Operating Procedures (SOPs) and documentation for lab operation
- Designed a lab-based course to train students on vibration testing and analysis

Benchmark Space Systems

Burlington, USA

MECHANICAL ANALYSIS ENGINEERING INTERN

May 2024 - Aug 2024

- Comparison of in-house random vibration shaker table tests with results from external testing services. Confirmed sufficiency of in-house test setup based on control accelerometer data
- Prediction of slosh frequency modes (via acoustics analysis) for various shapes of fuel tanks and transient structural analysis of the hyperelastic diaphragm deflection using Ansys Explicit Dynamics. Documented the analysis as a standard operating procedure for slosh analysis
- Structural Analysis (using Steinberg's method) and Thermal Analysis of thruster PCBA to assess risk in the design prior to environmental testing
- Structural analysis to validate burst tests for the permeability of a propellant tank liquid filter. Documented the analysis in the form of a report and a standard operating procedure for general membrane analysis

Hume Center for National Security and Technology

Blacksburg, USA

GRADUATE RESEARCH ASSISTANT

Aug 2023 - Dec 2024

- Developed a hardware-in-the-loop testbed for emulation of satellite mega-constellations and performed preliminary resiliency studies based on network performance metrics
- Studied the common aspects of space weather, their effects on satellite communication and ways to mitigate the associated risks

Virginia Tech

Blacksburg, USA

GRADUATE TEACHING ASSISTANT

Aug 2021 - Dec 2021

- Worked with Prof. Scott England as a Teaching Assistant for the course AOE 3154: Astromechanics.
- Duties included creating assignments, grading them and holding office hours for a class of 240 students

Colorado Center for Astrodynamics Research(CCAR)/Laboratory for Atmospheric and Space Physics (LASP)

Boulder, USA

MECHANICAL DESIGN ENGINEER

Jan 2020 - May 2021

- Worked on the structural and thermal subsystem of the Atmosphere Effects of Precipitation through Energetic X-rays (AEPEX) Mission
- Designed the instrument shielding to conform to the mission requirements
- Technical documentation including creating a flight assembly plan, technical drawings for the instrument as well as managing the mass budget and the master equipment list for the project
- Manufactured a prototype for the instrument for radiation and thermal vacuum tests

University of Colorado, Boulder

Boulder, USA

GRADUATE TEACHING FELLOW

Aug 2019 - Dec 2019

- Teaching Fellow for the course ASEN 3112: Structures. Duties included creating assignments/recitations and grading them and also facilitating labs for a class of 120 students
- Assisted Prof. Kurt Maute and Prof. Francisco Lopez Jimenez by holding office hours and helping the undergraduate students with understanding the course better

Colorado Center for Astrodynamics Research (CCAR)

Boulder, USA

STUDENT ASSISTANT III

May 2019 - Dec 2019

- Designed and analyzed the spacecraft bus for the CANVAS(Climatology of Anthropogenic and Natural VLF wave Activity in Space) CubeSat
- Designed a special PEEK holder to accommodate the payload(three-axis magnetic search coils) and satisfy the science requirements.

Air India Ltd.

Mumbai, India

INTERN, BASE MAINTENANCE DIVISION (BMD)

Dec 2016 - Jan 2017

- Worked on cargo compartment maintenance, change of landing gears and measurement of tire pressure.
- Studied the working and maintenance of the Rolls Royce Trent-1000 engine and its Environment Control Systems(ECS).
- Assisted in the maintenance of the fuselage of a varied Boeing fleet of Air India including 787, 747-400, 777-200LR, 777-300ER, and Airbus A380.

Academic Projects

Estimating wrinkling response of thin, pre-stressed membranes

Boulder, USA

LARGE SPACE STRUCTURES DESIGN COURSE

Jan 2020-April 2020

- Extend existing models to study the wrinkling response of three different configurations of solar sails: Square, Heliogyro and Spinning disk sails, subjected to pre-tension.
- Perform the non-linear geometric analysis to obtain the half-wavelength, the amplitude, deformed shape of the membrane, and stress distribution

Verification of post-buckling patterns in biaxially pre-stretched bilayer shells

Boulder, USA

RESEARCH ASSISTANT WITH PROF. FRANCISCO LÓPEZ JIMÉNEZ

Sep 2019-Dec 2019

- Analysis of non-linear buckling of spherical shells and the validation of experimental results via FEA in Abaqus Explicit
- Prediction of geometric patterns on the surface of the shells in the post-buckling regime

INSPIRESat-3

Boulder, USA

THERMAL LEAD

June 2019-Aug 2019

- Designed a simplified 3D model in AutoCAD and compiled the thermal constraints and heat loads for all bus components
- Worked on thermal design of the spacecraft and analyzed worst hot and cold cases in Thermal Desktop to optimize life and operation of the payloads
- Project supported by Laboratory for Atmospheric and Space Physics(LASP) and the INSPIRE program

Asteroid Rendezvous Mission

Boulder, USA

FAULT PROTECTION LEAD

Jan 2019-May 2019

- Designed the safe modes and developed a Failure Modes and Effects Analysis (FMEA) for a hypothetical mission to study the surface morphology of three main belt asteroids.
- Project supported by Laboratory for Atmospheric and Space Physics(LASP)

Structural design, simulation and analysis of a low altitude sounding rocket

Mumbai, India

TEAM LEAD

Aug 2017-May 2018

- The drag coefficient of a self-designed model rocket was calculated using ANSYS-Fluent and Wind tunnel analysis on a 3D-printed prototype and the results were compared.
- The drag force obtained was used to graphically simulate the trajectory of its flight, (powered by an F-class Estes rocket motor), in Matlab.

Honors & Awards

2025

Dean's Scholar, Pratt Fellowship: Awarded as part of a competitive university-wide fellowship funded by the largest private gift to Virginia Tech at the time, recognizing academic excellence and potential in engineering.

Blacksburg, VA