

Lawanya Awasthi

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Education

University of Michigan, (College of Engineering)

Master of Engineering: Space Engineering

GPA: 4.0/4.0

Membership: Tau Beta Pi Honor Society

UPES, (School of Engineering)

Bachelor of Technology: Aerospace Engineering

GPA: 3.78/4.0

Awards: Capstone Best Computational Project Award

Ann Arbor, MI, USA

Jan. 2023 – Apr. 2024

Dehradun, India

July 2018 – July 2022

Research Work

LEO Satellite Swarm for Sustainable Utility of Existing Ground-based Solar Infrastructures: Energy, Economics and Mission Design Validation

Skills: Data Collection, Python (Programming), Literature Review, Teamwork, Research

- Spearheaded the design and validation of a multi-altitude, multi-inclination LEO Sun-synchronous Polar orbits and flower constellation. Responsible for meticulous data collection on solar infrastructures across various countries, determining optimal satellite numbers for each set.
- Executed successful data generation and analysis, producing insightful projections for energy production, cost estimates, financial outlook, and a robust business model.

Space Exploration mission to study Titan's Environment & Conducting Experiments

Skills: CATIA V5, SolidWorks, Literature Review, ANSYS, MATLAB

- Designed an Orbiter and Submarine for a mission to explore Titan's geological processes and natural phenomena. Conducted research on Titan's liquid bodies, focusing on rivers and lakes, studying their methane composition.
- Led the design of the submarine and its instruments for in-depth surface analysis. The paper was published in The American Institute of Aeronautics & Astronautics SciTech Forum.

Colonizing Mars: In-Situ Resource Utilization of Martian Moon

Skills: Literature Review, Teamwork, Research Analysis, Presentation Skills, Space Exploration

- Conducted case study on advanced colonization techniques, emphasizing In-Situ Resource Utilization (ISRU) on Martian moons Deimos and Phobos. Explored surface mining, proposed central command station on Mars for moon rover and orbiter management.
- Led investigation into Deimos' atmospheric and surface characteristics, offering valuable insights. Analyzed data for detailed findings and future mission projections.

Exploratory mission to Mercury: Possibilities for future sample return missions

Skills: Data Collection, Literature Review, Research, Teamwork

- Facilitated a comprehensive case study focused on an interplanetary mission to Mercury, with a specific emphasis on researching Mercury's atmosphere.
- Tasked with gathering, analyzing, and presenting crucial details and characteristics, I played a pivotal role in providing a thorough understanding of the planet's atmospheric conditions and characteristics.

Relevant Experience

LSA Physics, University of Michigan

Ann Arbor, MI

Graduate Student Instructor (Teaching)

Aug 2023 – Present

Skills: Experimental Physics, Computational Physics, Python (Programming Language)

- Guided and supervised undergrad students through diverse physics lab experiments conducted on Jupyter Notebook.
- Provided hands-on assistance, particularly in programming aspects, ensuring a comprehensive understanding of both theoretical concepts and practical skills.

Space Physics Research Lab, University of Michigan

Ann Arbor, MI

Research Assistant (Internship)

May 2023 – Aug 2023

Skills: Attention to Detail, Data Collecting, Communication, Project Planning, Research

- Explored auroral phenomena and localized ground magnetic disturbances, delving into variations in Earth's magnetic field over specific geographic areas, including both natural and human-made sources.
- Contributed to scientific advancements by designing and implementing a comprehensive Science traceability matrix, a crucial tool for precise documentation and traceability of scientific objectives, methodologies, and data analysis techniques.

Moldwin Magnetics Lab, University of Michigan

Ann Arbor, MI

Research Assistant (Fellowship)

May 2023 – Aug 2023

Skills: Data Analysis, Data Collection, Microsoft Excel, Python, Communication

- Seamlessly combined magnetic latitude and longitude data from MACCS stations with Satellite SWARM & AMPERE information to discern correlations between Transient Large Amplitude (TLA) intervals and satellite over-flights.
- Collaborated with Dr. Brett McCuen to utilize a comprehensive TLA Events list, extracting specific details like dates, times, and station names.
- Developed a Python code to obtain precise latitude and longitude data for Satellites AMPERE at specific moments, contributing to the research objectives.

Projects

Michigan BLiSS Volatile Organic Compound (VOC) Deposition Project

Skills: Microsoft Office, MATLAB, Teamwork, Communication, Systems Engineering

- Contributed to the development of the NASA XHAB VOC Capture System for ISS as a key team member involved in the University of Michigan's successful \$50,000 contract-winning proposal.
- Executed a pivotal role as a system engineer, actively participating in the mechanical team to formulate the trade study and project requirements.

Michigan BLiSS Sensorimotor Assessment Tool (SMAT) Project

Skills: Space Systems, Collaborative Problem Solving, Python (Programming Language), Teamwork

- As a Space Systems Engineer, I played a pivotal role in the Michigan BLiSS Sensorimotor Assessment Tool (SMAT) Project team, contributing my expertise to the coding and data management team. Specializing in the development of code for generating plots to visualize sensor data.
- This experience has enriched my understanding of space systems engineering, providing me with valuable insights into the complexities of managing and visualizing sensor data.