

SOURAV GHOSH

Aerospace Engineer

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Education

The University of Tokyo

Master of Engineering, Aeronautics and Astronautics

Tokyo, Japan

Oct 2024 – Sep 2026

- Thesis: “An End-to-End Framework for Cislunar SSA and Object Tracking using Photometry”
- Funded by the MEXT Scholarship, Government of Japan.

Jain (Deemed to be University)

Bachelor of Technology, Aerospace Engineering

Bengaluru, India

Sep 2020 – May 2024

- Grade: 8.66/10.
- Final Year Project: “A Comparative Study of Performance of Modern Lambert’s Problem Solvers.”

Research and Professional Experience

Intelligent Space Systems Laboratory, The University of Tokyo

Graduate Researcher

Tokyo, Japan

Apr 2025 – Present

- Conduct research in space situational awareness, cislunar and interplanetary mission design, and trajectory optimization.

Human Space Flight Centre, Indian Space Research Organisation

Project Intern

Bengaluru, India

Jan 2024 – Apr 2024

- Completed Final Year Project under the guidance of senior scientists.

Team Avadhi, Jain (Deemed to be University)

Co-founder; Lead, Avionics, Telemetry and GNC

Bengaluru, India

May 2022 – Jan 2024

- Co-founded a collegiate high-powered rocketry club and led avionics, telemetry, and guidance, navigation and control for sounding rockets.
- Contributed to propulsion and CONOPs definition.
- Designed the flight computer and control system for recovery systems.

Team Ardra, Jain (Deemed to be University)

Team Leader

Bengaluru, India

Aug 2022 – Apr 2024

- Led the collegiate CANSAT team participating in the IN-SPACe CANSAT Student India Competition 2022–24.
- Led flight software, telemetry, attitude control, and full-system integration; supported recovery-system design.
- Designed the ground-station antenna.

Selected Projects

SAEIndia Aerothon 2023 – Vision-Based Autonomous Quadcopter

2023

- Implemented autonomous operational modes using PyMAVLink.
- Implemented object recognition using YOLOv8 and designed flight control using Pixhawk 2.4.8.

Airborne and Space-borne Synthetic Aperture Radar Calibration

2023

- Calibrated SAR systems using corner reflectors for an aircraft-based SAR operating at 10,000 ft and for RISAT-1A.

Agnibaan-1 High-Powered Rocket, Team Avadhi

2023

- Supported a flight that achieved an apogee of 2,007 ft.
- Designed an STM32F4-based flight computer and a calibrated static-thrust test stand for solid-motor testing.

IN-SPACe CANSAT Student India Competition 2022–24

2024

- Led flight software, telemetry and attitude control; contributed to parachute design and recovery.
- Managed full-system integration, designed the ground-station antenna, and integrated the system with the organiser’s UAV launch platform.

Team Aeros – Interplanetary Aerial Systems Challenge

2021

- Contributed to the avionics design of a Martian UAV developed from organiser-provided design requirements.

Publications and Conference Contributions

- Chandar, A. E., Phalphale, A., **Ghosh, S.**, and Desai, S. (2021). "Structural Investigation of Agricultural UAV." *International Journal of Scientific Research & Engineering Trends*, 7(2).
- Ghosh, S.**, Badgujar, S., Gyeltshen, T., and Allamaprabhu, C. Y. (2024). "Lunar Mission Design using the Three-Body Problem." *International Conference on Advances in Aerospace and Energy Systems 2024*, Thiruvananthapuram, India.
- Ghosh, S.**, Sharma, P. S., Badgujar, S., Pundit, S., and Nagesh, A. (2024). "Characterization of Orbits in Cislunar Space for Space Traffic Management." *International Astronautical Congress 2024*, Milan, Italy.
- Varma, K., **Ghosh, S.**, Badgujar, S., Furtado, G., and Puthiyadath, V. (2024). "Constraints and Challenges in Guidance, Navigation and Control Architectures for Beyond Earth Orbit CubeSat Missions." *International Astronautical Congress 2024*, Milan, Italy.
- Maurya, R., Wischert, D., **Ghosh, S.**, et al. (2024). "Sailing Through Space: Advancing Space Exploration with Maneuverable Solar-Sailed Small Satellites." *International Astronautical Congress 2024*, Milan, Italy.
- Maurya, R., Wischert, D., **Ghosh, S.**, et al. (2024). "Conceptual Design and Feasibility Analysis of Maneuverable Solar-Sailed Small Satellites for Deep-Space Exploration and Communication." *International Astronautical Congress 2024*, Milan, Italy.
- Ghosh, S.**, Sharma, P. S., Badgujar, S., and Pundit, S. (2025). "Cislunar Space Traffic Management based on Operational Zones." *35th International Symposium on Space Technology and Science 2025*, Tokushima, Japan.
- Ghosh, S.**, Sharma, P. S., Pundit, S., Bitla, R., Prusty, S., and Badgujar, S. (2026). "Long Term Evolution of Space Debris Clouds in the Cislunar Region." *International Conference on Spacecraft Mission Operations 2026*, Bengaluru, India.
- Prusty, S.* and **Ghosh, S.*** (2026) "A Phase-Indexed Dynamical Network Formulation for Cislunar Logistics Optimization." *3rd Aerospace Symposium for Technological Research Advancements*, Trivandrum, India.
- Ghosh, S.**, Kawabata, Y., and Funase, R. (2026). "An End-to-end Framework for Cislunar Space Situational Awareness and Multitarget Tracking using Photometry." *36th AAS/AIAA Astrodynamics Specialist Conference 2026*, Whistler, British Columbia, Canada.
- Ghosh, S.**, Kawabata, Y., and Funase, R. (2026). "Photometry-aware Sensor Placement for Cislunar Space Situational Awareness." *36th AAS/AIAA Astrodynamics Specialist Conference 2026*, Whistler, British Columbia, Canada.

Leadership, Outreach and Volunteering

Brahmastra Aerospace Systems <i>Space Evangelist</i> Representative at Jain (Deemed to be University).	Aug 2020 – Jan 2021
Open Cosmos <i>Ambassador</i> Trained users on the Open Cosmos mission simulator, OpenApp, and supported preparation of slides for the OpenApp workshop at IAC 2021 in Dubai.	Feb 2021 – Feb 2022
SGAC SG[India] 2022 <i>Local Organising Committee</i> Supported event logistics, catering and social-media communications.	Oct 2021 – Apr 2022
Spaceonova, Bengaluru Section <i>Space Ambassador</i> Contributed articles to Spaceonova's newsletter.	Aug 2021 – Mar 2022
Deep Space Initiative <i>Andromeda Program 2023</i> Completed a research training program; findings were published at IAC 2024 in Milan.	Feb 2023 – Dec 2023
11th UNISEC Global Meeting <i>Volunteer</i> Served as volunteer staff for the meeting held at The University of Tokyo.	Sep 2025 – Nov 2025

*Equally Contributed.

Software Developed

cr3bp and astromat	Since 2024
• MATLAB libraries for Astrodynamics research (Multibody Dynamics and Keplerian).	
CisLunar Astronomical Photometry Simulator (CLAP)	Since 2025
• MATLAB-based high-fidelity spaceborne camera simulation tool, primarily for SSA and object tracking. • May be modified for simulating RPOD, Star Trackers, Visual Navigation, among other possible applications. • Part of Master's thesis research.	
Tradespace Analysis Tool for IoT Constellations (TAT-IoTC)	Since 2026
• Python-based IoT Constellation mission design tool.	

Selected Coursework

• Vibration of Elastic Systems • Control Systems Engineering • Flight Mechanics I and II • Introduction to Radar Systems • Operations Research • Aerodynamics • Aerospace Propulsion • Micromechatronics • Observation and Exploration of Planets and Earth	• Remote Sensing Image Analysis • Advanced Energy Conversion • International Systems Design Workshop • Water Surface Waves • Systems and Control • Analytical Methods in Mathematical Informatics • Special Lectures in Spacecraft Control • Multidisciplinary Design Optimization
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Selected Online Certifications and Short Courses

• Rocket Propulsion – NPTEL • Introduction to Launch Vehicle Analysis and Design – NPTEL • Space Flight Mechanics – NPTEL • Computational Science in Engineering – NPTEL • Automatic Control – NPTEL • Mechanics and Control of Robotic Manipulators – NPTEL • Aerospace Materials – Coursera • Kinematics: Describing Motion of Spacecraft – Coursera	• Kinetics: Studying Spacecraft Motion – Coursera • Arm Cortex-M Processors Overview – Coursera • AstroTech: The Science and Technology behind Astronomical Discovery – Coursera • Introduction to Programming with MATLAB – Coursera • Systems Engineering – Coursera • Introduction to Experiments in Flight – IIT Kanpur Flight Laboratory, Feb 2023 • Rocket Systems Technologies – Indian Institute of Science, Jun 2024
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Professional Memberships

Space Generation Advisory Council	Since 2020
• Volunteered during SG[India] 2022. • Member of the Small Satellite Project Group. • Participated in the Maneuverable Solar Sail Satellites project; findings were published at IAC 2024.	
Society of Automotive Engineers India (SAEIndia)	Since 2023
• Participated in SAEIndia Aerothon 2023.	
Aeronautical Society of India	Since 2024
UNISEC Global	Since 2025
• Volunteered as staff during 11th UNISEC Global Meeting, The University of Tokyo (November 1-4, 2025).	

NPTEL: National Platform for Technology Enhanced Learning, India.