Divyam Sood

EECS Undergraduate, IISER Bhopal

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EDUCATION

Indian Institute of Science Education and Research (IISER)   Bhopal, India
Bachelor of Science in Electrical Engineering and Computer Science (EECS)   *Aug. 2023 – Present*
- **CPI:** 9.19/10.00
- **Relevant Coursework**: Linear Control Theory, Ordinary Differential Equations, Control Systems, Real Analysis, Theory of Computing, Probability & Statistics, Signals & Systems, Algorithms, Mechanics, Analog Circuits.

PUBLICATIONS

- A. Banerjee, **D. Sood**, A. Sen, and S. PB, "**SHIELD: Safe Hybrid Integration of PPO and MPC for Reliable Trajectory Tracking of Autonomous Ground Vehicles**," Oral Presentation, 13th Intl. Conf. on Robot Intelligence Technology and Applications (RITA 2025), London, UK. To appear in Springer LNNS.
  Contribution: Co-developed hybrid PPO–MPC control architecture and validated sim-to-real performance on physical UGV platforms.

- A. Banerjee, **D. Sood**, A. Sah, A. Sen, and S. PB, "**TRaCe: Trajectory Tracking with Budgeted Localization using Meta-Reinforced Learning and Belief-Aware MPC**," Oral Presentation, 13th Intl. Conf. on Robot Intelligence Technology and Applications (RITA 2025), London, UK. To appear in Springer LNNS.
  Contribution: Designed belief-aware MPC framework integrating meta-RL for trajectory tracking under constrained localization budgets and validated performance on physical UGVs.

RESEARCH EXPERIENCE

MuSiC Lab   IISER Bhopal
Undergraduate Researcher (Advisor: Dr. Arijit Sen)   *Jan. 2025 – Present*
- **Sim-to-Real Transfer:** Developed a ROS2–Gazebo simulation pipeline for UGV and UAV systems, enabling systematic evaluation of control and RL policies under sensor noise, latency, and model uncertainty before real-world deployment. Additionally, implemented and validated these theories on TurtleBot3 and Crazyflie in real-world experiments.
- **System Analysis and Robustness:** Analyzed stability and performance trade-offs in hybrid RL–MPC systems under bounded localization error and partial observability.
- **Soft Robotics Modeling:** Performed finite element analysis (FEA) in COMSOL Multiphysics to model stress distribution and deformation in PDMS-based soft robotic actuators, informing design choices for bio-inspired manipulation.
- **Resource-Constrained Control:** Currently designing event-triggered and resource-aware control frameworks which work under partial observability, explicitly modeling sensing and computation constraints.

HONORS & AWARDS

- **IAS-INSA-NASI Summer Research Fellowship (2025):** Selected for the prestigious national science academy fellowship, awarded to top undergraduate students in India.

TECHNICAL PROJECTS

PDF-M8 | *Python, LangChain, Web Development*   2025
- Designed a RAG-based system for large-scale PDF querying using vector embeddings and semantic search; implemented full-stack pipeline for document ingestion, retrieval, and interactive Q&A. The code is at https://github.com/soododivyam/VistaarHackathon .

TECHNICAL SKILLS

Robotics: Sim-to-Real Transfer, ROS2 (Robot Operating System), Gazebo, MPC, RL
Programming: Python, C++, AVR Assembly
Hardware: Sensor Integration, Digital Logic (74xx Series), Analog Circuit Analysis (Op-Amps, RLC) using Oscilloscope & Function Generator
Tools: LaTeX, Linux, LTSpice, CAD tools (AutoCAD, Fusion 360), Windows