Saksham Gupta

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Education

International Institute of Information Technology, Hyderabad (IIITH) **Jan 2023 – Dec 2024**
Master of Science by Research, Electronics and Communication Engineering *Hyderabad, India*
Major in Robotics, CGPA: 9.17/10 **Supervisor:** Dr. Spandan Roy

Narsee Monjee Institute of Management Studies (NMIMS) **Jul 2016 - Aug 2020**
Bachelor Of Technology, Mechatronics Engineering, CGPA: 2.76/4 *Mumbai, India*

Publications (** : equal contribution*)

Peer Reviewed |

- R. D. Yadav*, B. Jones*, **S. Gupta***, A. Sharma, J. Sun, S. Roy, and J. Zhao, "An integrated approach to aerial grasping: Combining a bistable gripper with adaptive control," *IEEE/ASME Transactions on Mechatronics*, 2025. [Paper] [Video]
- **S. Gupta***, S. Mishra*, A. Ayub, K. Farooque, S. Roy, and B. Gupta, "Bab_Sak Robotic Intubation System (BRIS): A Novel Endotracheal Intubation System with an Integrated Monocular Carinal Measurement Module," *1st International Workshop on the Evolving Landscape of Surgical Robotics (ELSR), IEEE ICRA*, Atlanta, USA, 2025. [Poster]
- A. Sharma, **S. Gupta**, S. P. Singh, R. D. Yadav, H. Song, W. Pan, S. Roy, and S. Baldi, "Impedance and stability targeted adaptation for aerial manipulator with unknown coupling dynamics," *IEEE International Conference on Control, Automation and Systems (ICCAS)*, 2025. [Paper] [Video]
- **S. Gupta**, A. Sharma, A. Mulgundkar, R. D. Yadav, and S. Roy, "Adaptive Control of Quadrotor under Actuator Loss and Unknown State-dependent Dynamics," *IEEE 20th International Conference on Automation Science and Engineering (CASE)*, Bari, Italy, 2024, pp. 717-722. [Paper]

Under Review |

- **S. Gupta***, R. D. Yadav*, A. Sharma, S. Roy, S. Baldi, and W. Pan, "A switched adaptive control framework for aerial manipulators under dynamic transitions," *IEEE Transactions on Robotics*. [Paper] [Video]
- **S. Gupta***, S. Mishra*, A. Mittal, A. Ayub, K. Farooque, S. Roy, and B. Gupta, "Bab_Sak Robotic Intubation System (BRIS): A novel endotracheal intubation system with an integrated monocular carinal measurement module," *IEEE Transactions on Medical Robotics and Bionics*. [Paper] [Video]
- A. Sharma*, **S. Gupta***, R. D. Yadav, W. Pan, S. Roy, and S. Baldi, "Achieving adaptive impedance control for autonomous aerial manipulation under unknown dynamics," *IEEE/ASME Transactions on Mechatronics*. [Paper]
- S. Mishra, R. D. Yadav, A. Das, **S. Gupta**, W. Pan, and S. Roy, "AERMANI-VLM: Structured Prompting and Reasoning for Aerial Manipulation with Vision Language Models," *IEEE Robotics and Automation Letters*. [Paper]

Patents (Under Review)

- Robotic Intubation System with Integrated Carinal Depth Measurement Module, Indian Patent Application (Filed 2023). Provisional Patent Number: 02311072640
- Compliant & Modular Drone-based Pollination Mechanism, Indian Patent Application (Filed 2025)

Experience

Sr. Research Associate, *Technology Commercialization* **Jul 2020 - Present**
Tambourine Innovation Ventures Inc.(TIV), Vienna, VA, United States *Remote Work*

- TIV is an innovation advisory and venture acceleration firm. It works with prestigious international clients such as the World Bank, OECD, UNIDO, US Dept of Energy, etc.
- Led end-to-end innovation support at TIV, spanning research proposal and grant writing for agencies and institutions; market readiness analysis and prototyping; intellectual property and tech transfer strategy (start-up licensing and commercialization); market research on royalty comparables, license terms, and VC term sheets; and support for SBIR/STTR proposals including grant writing, budgeting, and commercialization planning.

Research Associate, *Non-Linear Control for Aerial Manipulation* **Jan 2022 – June 2025**
Supervisor: Dr. Spandan Roy *Robotics Research Center, IIIT Hyderabad.*

- Researched, formulated, and deployed advanced non-linear control strategies on aerial manipulators, continuum robots, and surgical robotic systems, achieving improvements in accuracy, stability, and fault tolerance under uncertain dynamics.

Teaching Assistant, *Robotics - Dynamics and Control; Advances in Robotics and Control* **Fall 2024; Spring 2024**
Supervisor: Dr. Nagamanikandan Govindan and Dr. Spandan Roy *IIIT Hyderabad.*

- Drafting and grading assignments, quizzes, projects and semester exam papers. Weekly doubt clearing sessions.

Research Associate, *Robotic Intubation System* **Feb 2021 – Feb 2023**

All India Institute of Medical Science (AIIMS) and Indian Council of Medical Research (ICMR) *New Delhi, India*

- Designed and prototyped an airway management continuum robot for intubation with monocular depth estimation, while developing its hardware and software control systems; additionally conducted patent analysis, market research, and assisted the PI in preparing techno-commercial reports.

Projects — Webpage for all the projects and experimental video

Agricultural Drones | **Jan 2022 - Jul 2024**

- Designed, manufactured, and commercialized a drone-based pollination system for paddy crops in collaboration with Bayer Crop Science; developed adaptive control strategies for precise Gibberellic acid spraying and engineered an active roller-based pollinator module attachable to drones to enhance pollination efficiency.

Magnetic Shape Memory Alloy based satellite payload | **Jan 2022 - Jul 2023**

- Started and led a 5-member student team on an ISRO(Indian equivalent to NASA) SpaceShare–selected pilot project (among 8–9 finalists from thousands of proposals) to study the behavior of Magnetic Shape Memory Alloy in space; designed and built a highly constrained Terfenol-D testbed payload, and oversaw regression and stress testing (thermovac, vibration, signal encryption/attenuation) in Class-1 clean rooms.

Technical Skills

Languages: Python, C, C++, MATLAB
Tools: Ubuntu, ROS, Gazebo, Solidworks, PX4-SITL, Qground Control, Git, IssacSim, Mujoco, Pytorch, RTOS, Latex
Hardware: 3-D Printer, Boards(Pi, Intel NUC, Jetson), Pixhawk, Realsense Camera, Optitrack Motion Capture System

Key Highlights

Awards and Recoginization |

- IIIT Hyderabad Research Student Fellowship (2023–2024) - awarded to cover full tuition during Master's program.
- Dean's List Honoree and Student Ambassador Award for leadership in representing NMIMS University at external academic and technical forums (2016–2020).
- Best MATLAB and ROS Usage Award at ABU Robocon National Robotics Competition (2017).
- Global Rank 4 at Singapore Autonomous Underwater Vehicle Challenge (2018) — served as Team Lead.
- Social Media Award at Singapore Autonomous Underwater Vehicle Challenge (2019) — served as Team Lead.

Leadership, Outreach and Extra-Curricular Activities |

- Started and led teams for national and international robotics competitions including *Robocon 2017*, *Singapore Autonomous Underwater Vehicle Challenge (SAUVC)*, and the *Intelligent Ground Vehicle Competition USA (IGVC)*, gaining early exposure to large-scale system design, cross-disciplinary collaboration, and team management.
- Served as Co-curricular Technical Secretary during undergraduate studies, coordinating student teams and fostering a campus-wide interdisciplinary innovation ecosystem.
- Volunteered with an NGO (Human Welfare for Gurgaon) to teach mathematics and science to underprivileged students (Grades 1–5), strengthening my communication and mentoring skills.
- Achieved Regional Gold Medal in Lawn Tennis (2012),demonstrating discipline and competitive spirit beyond academics.
- Organized cultural and heritage tours as a summer guide at Hampi (UNESCO World Heritage site), honing public engagement and storytelling abilities.
- Reviewer for leading journals and conferences: IEEE/ASME TMECH, IEEE L-CSS, IEEE RAL, ICRA, IROS, IEEE TASE, and IEEE CASE.

Presentations |

- Poster Presentation, *IEEE International Conference on Robotics and Automation (ICRA)*, Atlanta, USA (Apr 2025).
- Guest Lecturer, IIIT Hyderabad — Master Trainer Program on Allied UAS Technologies, organized under the Ministry of Electronics and IT (Apr 2024).
- Invited Talk, All India Institute of Medical Sciences (AIIMS), New Delhi — on airway management robotics (Jan 2025).
- Poster Presentations at IIIT Hyderabad R&D Showcase on autonomous aerial navigation (2022, 2023, 2024, 2025).

Research Collaborations |

- **Dr. Jianguo Zhao**: Head Adaptive Robotics Lab, Colorado State University, USA.
- **Prof. Simone Baldi**: School of Mathematics, Southeast University, Nanjing, China.
- **Dr. Wei Pan**: Associate Professor, Department of Computer Science, University of Manchester.

References

Dr. Spandan Roy, Assistant Professor, IIIT Hyderabad. (spandan.roy@iiit.ac.in)
Prof. Babita Gupta, Anaesthetist, Professor, All India Institute of Medical Science (dr.babitagupta@aiims.gov.in)
Prof. Atul B. Wad, CEO, Tambourine Innovation Ventures. (atul@tivinc.com)
Dr. Lisa Collins, General Manager, Tambourine Innovation Ventures Inc (lisa@tivinc.com)