

Saksham Gupta

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🎓 Education

International Institute of Information Technology - Hyderabad (IIITH), Jan 2023 – present | Hyderabad, India
MS by Research (Robotics)
CGPA: 9.17/10

Narsee Monjee Institute of Management Studies (NMIMS), 2016 – 2020 | Mumbai, India
Bachelor Of Technology, Mechatronics Engineering

- **Dean's List Honoree - Student Ambassador Award**
- Specialization: Hydraulics and Pneumatics, Additive Manufacturing; Industrial Drives; Virtual Instrumentation; PLC Programming; Product Design & Development; Robotics.

💼 Work Experience

Research Assistant, RRC-IIITH Jan 2022 – present | Hyderabad, India
The Robotics Research Center (RRC) is a part of the International Institute of Information Technology (IIIT) in Hyderabad, India. The lab aims to work on research problems and innovative projects that extend the state of the art in robotics.

- I am working on Design and Adaptive Control for aerial manipulators, Continuum robots, and Surgical Robots.

Sr. Research Associate, Tambourine Innovation Ventures Inc. Aug 2020 – present | Vienna, VA, United States
Tambourine Innovation Ventures (TIV) is an innovation advisory and venture acceleration firm dedicated to poverty alleviation and sustainable growth through technology based economic development. It works with prestigious international clients such as the World Bank, OECD, UNIDO, US Dept of Energy, etc.

- Writing research proposals, and grant applications for multiple agencies, organizations & institutions.
- Analyzing market readiness, Developing prototypes; Analyzing Intellectual Property strategy.
- Developing tech transfer strategy for inventions (start-up, licensing, etc.).
- Conducting market research (royalty comparables, license terms, term sheets for VCs)
- Supporting SBIR proposals through grant writing, budgeting, and commercialization strategy for startups and research institutions.

Research Assistant, All India Institute of medical Science Feb 2021 – Feb 2023 | New Delhi, India
ICMR is the Indian equivalent of the US National Institute of health. ICMR has funded our research, and I am working on designing and prototyping an airway management robot under an anesthesiologist.

- Designing and prototyping an airway management continuum robot for intubation.
- Developing Hardware and Software control systems for the robot.
- Analyzing patent databases; Conducting market research.
- Assisting the PI in the preparation of various techno-commercial reports.

📄 Publications and Patents

Adaptive Control of Quadrotor under Actuator Loss and Unknown State-dependent Dynamics, 2024 IEEE 20th International Conference on Automation Science and Engineering (CASE), Bari, Italy, 2024, pp. 717-722, doi: 10.1109/CASE59546.2024.10711418.

An integrated approach to aerial grasping: Combining a bistable gripper with adaptive control. arXiv preprint arXiv:2311.00769, Under Review (TMECH)

Bab_Sak Robotic Intubation System (BRIS): A Novel Endotracheal Intubation System with an Integrated Monocular Carinal Measurement Module, Under Review (IEEE RAL)
Provisional Patent Application no. 202311072640

📁 Undergrad Projects

Intelligent (Environment Aware) Autonomous Vehicle, Aug 2019 – Jun 2020
for IGVC (Intelligent Ground Vehicle Competition), organized by RoboNation
Annual international competition held at Rochester Institute of Technology where multiple teams of multi-disciplinary nature compete to build an autonomous vehicle according to a fixed set of rules to compete on various grounds.

- Led a team of 20+ students; oversaw all major aspects of the product's (robot's) development from manufacturing to electronics to computer programming.
- Developed a fully compliant all-terrain vehicle for autonomous motion tracking; path planning & traversal.

An open, easily replicable & modular design for a regenerative aqua pump, Jul 2019 – Apr 2020
Final Year Undergraduate Project
An innovative project to design and build non-electric treadle like water pumps that instead of using electricity, generates battery power thus tackling the vexed water-energy-nexus challenge. Donated it to a rural municipal corporation in India.

- Designed an open-hardware system using commercial off the shelf components (COTS); which can be easily replicated at scale.
- Developed a modular water pump - can be connected to any bicycle & used for generating electricity & for pumping water at the same time from a well.
- Achieved a low cost - high ROI (with one-time CAPEX) by designing a product with eco-friendly; readily-available & economic components.

NMIMS Robotics Testbed - 1 (NRT-1), a satellite payload, Manufacturing Engineer Oct 2019 – Feb 2020
A pilot project to study the behaviour of Magnetic Shape Memory Alloy in space.

- Organized by ISRO (the Indian Space Research Organization); under its SpaceShare program - about 8-9 applications were finalized from a pool of thousands of research proposals (which included top Indian Institutes).
- Designed and manufactured a test-bed for a Terfenol-D (magnetostrictive material) in space.
- Lead design & manufacturing of a highly constrained payload (constrained by space, dimensions, weight & scale of components attached).
- Performed various regression & stress tests on the payload - thermovac, vibrations, signal encryption & attenuation in Class 1 clean rooms.

Singapore Autonomous Underwater Vehicle Challenge 2018 & 2019,

Jun 2017 – Jul 2019

Team Captain

- Annual Robotics Challenge organized by the IEEE OES (Oceanic Engineering Society).
- Led a team of 12 students; for designing, manufacturing & building an underwater autonomous vehicle.
- The team won numerous accolades - stood 4th amongst 45 international teams in 2018; stood 7th amongst 57 international teams in 2019; bagged the Social Media Prize in 2019.
- Designed a modular, component-based AUV system for performing a multitude of tasks - SLAM based navigation & planning; visual identification of key zones/areas in the robot vicinity; acoustics (hydrophones, DVL) based localization & performing various decommissioning tasks with the help of a 6-DOF robotic arm.

Student race car with a carbon fiber chassis, Formula Bharat (India) 2017

Aug 2016 – Jul 2017

- National student racing competition (F1-style) where hundreds of national-level teams participate to compete over various grounds.
- The first foray into building intelligent vehicles (products) - developed an understanding of all technical aspects such as racing car vehicle dynamics, aerodynamics, impact attenuation, fatigue testing, designing parts at micro-scale & integrating at the macro (systems engineering), design of exhausts, steering, suspensions, etc.

Soft Robotic Pneumatic Arm,

for Undergraduate Course - Electro Mechanical Workshop Project

- Designed & manufactured a soft robotics gripper that can grab protean shapes.
- Arm was based on a simple bio-mimetic principle - three tentacle based gripping.

Awards

Dean's List - Student Ambassador Award,

Aug 2020

Narsee Monjee Institute of Management Studies

- Honored by the university for winning multiple awards for the university & performing collaborative research with national/international institutes

GLOBAL RANK 7 & SOCIAL MEDIA AWARD,

Mar 2019

at Singapore Autonomous Underwater Vehicle Challenge 2019

- Global Rank 7 out of 57 international teams
- We were the only Indian team to make it into the top 15

GLOBAL RANK 4, at Singapore Autonomous Underwater Vehicle Challenge 2018

Mar 2018

- Rank 4 out of 45 international teams

Award for "Best Usage of MathWorks tools" at the ABU RoboCon National Robotics Competition in 2017

Mar 2017

- Asia Pacific Broadcasting Unit's Robocon robotics competition is organized annually at a national level in India, with 100s of teams participating each year.
- Teams are awarded for their excellence; in our case; for outstanding work carried out in simulations of the robot's control systems.

Skills

PLC | Computer Aided Design/Manufacturing | Hydraulics & Pneumatics | Solidworks | System Design & Signal Processing | Additive Manufacturing | Microprocessors & Microcontrollers | C++ | Embedded Programming & Troubleshooting | Finite Element Analysis | Underwater Acoustics | ROS (Robot Operating System) | Python

Languages

English, Hindi, Marathi, Sanskrit

References (More can be provided as needed)

Prof. Spandan Roy, Assistant Professor, IIIT Hyderabad
spandan.roy@iiit.ac.in

Dr. Babita Gupta, Anaesthetist, Professor, All India Institute of Medical Science
drbabitagupta@hotmail.com

Prof. Atul B. Wad, CEO, Tambourine Innovation Ventures
Atul@tivinc.com

Dr. Lisa Collins, General Manager, Tambourine Innovation Ventures Inc. (ex Dean of Saybrook College at Yale University)
lisa@tivinc.com