

# Saksham Gupta

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## 🎓 Education

**International Institute of Information Technology - Hyderabad (IIITH),** Jan 2023 – present | Hyderabad, India  
*MS by Research (ECE)*  
CGPA: 9.2/10

**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.

## 👛 Professional 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 Control for aerial manipulators, Continuum robots, and Surgical Robots.

**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)

**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.

## 📁 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. The project deliverable is a payload; set to launch on an upcoming PSLV rocket (in Q3 2022).
- 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.

### Publications

#### **Bab\_Sak Robotic Intubation System (BRIS): A Novel Endotracheal Intubation System with an Integrated Monocular Carinal Measurement Module, Under Review (IROS 2024)**

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

**Adaptive Control of Quadrotor under Actuator Loss and Unknown State-dependent Dynamics, Under Review (CASE 2024)**

### 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

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