

Education

- **Bachelors of Technology - Indian Institute of Technology Guwahati** [7.52 CPI]
 - Major - Mechanical Engineering
 - Machine Design
 - Computer-Aided Design and Manufacturing
 - Additive Manufacturing
 - Robotics and Robot Applications
 - Control Systems
 - Minor - Electronics and Communication
 - Signal Processing
 - Communications
 - Analog and Digital Circuits
 - Electives and Extracurricular
 - Biomedical Devices and Systems
 - Neural Imaging and Signal Processing
 - **Higher Secondary (Class XII) - TSBIE** [96.4 %]
 - **High School (Class X) - CBSE** [10 CGPA]
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Publications

- **Rapid Manufacturing of Biomedical Devices - Process, Alternatives and Selection**
Chapter in: Advanced Micro- and Nano-manufacturing Technologies
[PUBLISHED, LISTING IN PROGRESS] [Springer]
- **Design and Modelling of Novel Mechanized Injection Platform**
Conference: Advances in Robotics 2019, The Robotics Society
[PUBLISHED] [ACM]
A mechanized medical injection platform designed to further develop a versatile device that can administer injections at various sites on the human body, via remote access.
- **BNN based design of Sit to Stand Exoskeleton for Paraplegic Children**
Conference: ICCAR 2020 Singapore
[PUBLISHED] [IEEE]
Design of a novel low cost powered wheelchair-exoskeleton device to provide assistance to paraplegic children in their sit-to-stand motion.

- **A Portable Mechanical Ventilator for Respiratory Emergencies**
Patent Application No. 202031045726
 [REGISTERED PROVISIONALLY] [CGPDTM]
 Design of a rapid manufacturable ventilator with dynamically variable linkage parameters for simple mechanical and online adjustment of breathing cycle variables
 - **A Comparative Performance Analysis of Backpropagation Training Optimizers to Estimate Clinical Gait Mechanics**
Chapter in Predictive Modelling in Biomedical Data Mining and Analysis (Elsevier)
 [ACCEPTED, IN PRODUCTION] [Elsevier]
 - **3DP During COVID 19**
Chapter in: Emerging Applications of 3D Printing During CoVID 19 Pandemic
 [PUBLISHED] [Springer]
 - **3D Printing in Podiatrics**
 [MANUSCRIPT IN DRAFT] [Springer]
 - **Venous Imaging and Force Feedback Needle Guidance Paradigm for Remote Injections**
 [MANUSCRIPT IN REVIEW]
 - **Ventilator Controlled Manipulation - Mapping of Characteristics and Sensitivity**
 [MANUSCRIPT IN DRAFT]
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Experience

- **Engineering Officer** *September 2020 - September 2021*
Maintenance Department, Visakh Refinery, Hindustan Petroleum Corp. Ltd.
 On-site execution of maintenance of static mechanical equipment - heat exchangers, reactors, vessels, columns, furnaces, piping, structures, etc. - on planned, unplanned, shutdown and emergency timelines.
- **Co-founder**
Mitochondrial
 IntuBox
 Crutch
- **Research Intern** *September 2019 - July 2020*
Mechatronics and Robotics Laboratory, Department of Mechanical Engineering, IIT Guwahati
 Development of Platform for Remote Medical Injection (under Prof. S.K. Dwivedy, HOD) Control design and prototyping of the previously published design as part of my Bachelors' Thesis Project at the Mechatronics and Robotics Lab. Developed a vision module for vein detection and needle guidance. Currently working on the control paradigm for semi-automatic operation.

Projects

- **NUCLEUS Biosatellite**

Member of the payload mechanical design team. Aim to study microbial life in low earth orbit.

- **Ventilator - Linkage Exploration and Optimization**

- **Mito Gait Module**

- **Modular Crutch**

- **Mutli - Arm Additive Manufacturing**

- **EEG Dataset Preprocessing**

- **AutoInject**

- **In-Situ Casting - Additive Manufacturing**

August 2019

Dr Sajan Kapil, Department of Mechanical Engineering, IIT Guwahati

Design of a modular technique for improving isotropic strength and build time for FDM printing.

- **Prosthetic arm with haptic response**

October 2016

Designed an artificial arm with calibrated vibrators strapped around the upper arm of the user, enabling a habitually redeveloped their sense of touch.

Tinkering

- **Stereo Imager**

- **Quadcopter**

- **AudioField**

- **E-Rickshaw Dataset**

Independent Project

Acquisition of data from electric rickshaws operating within the campus, analogous to KITTI.

- **Monoducted Drone**

Long term

Hobby Project

Design of a UAV with a single duct, an imitation of the Cleo drone with coupling capability.

- **Bed-Top Table**
- **Hospibutler**
- **CAPP in Micromanufacturing of Monolithic Designs**
- **SC Superalloys**

Technical Skillset

- **Mathematical:** Linear Algebra, Kalman Filter, FFT, DSP
- **CAE Packages:** Solidworks, ANSYS*
- **Programming Languages:** MATLAB, C*, Python*, Git*, HTML/CSS*
- **Microprocessors:** Raspberry Pi, Arduino,
*Experiential Understanding

Workshops & Hackathons

- **Inter IIT Tech Meet, 2018:** Won the **Gold** medal in the BETiC Biomedical Innovation Challenge at IIT Bombay by redesigning the orthopaedic crutch, ergonomically.
- **Department Change, 2017:** Awarded to the top 10% of freshmen
- **Quadcopter Hackathon, Kriti 2016:** Secured 2nd position in the inter-hostel contest.
- **Teach Finance, Kriti 2016:** Explained via presentation, the Brexit conundrum to secure 2nd position.
- **MIT COVID 19 Hackathons - BEAT THE PANDEMIC 1,II**
 - Local.ly
 - CoviCare

Positions of Responsibility

- **Head, IIT Guwahati Model United Nations** 2018-19
Spearheaded a team consisting of 25 individuals, managing finances, logistics, collaborations and dynamics of the team. Enabled the establishment of the IITGMUN Workshop.
 - **Executive (Deputy Secretary-General):**
2017-18
Prepared the agenda for deliberation in the United Nations General Assembly, on the impasse over the Northwest Passage.
- **Literary Secretary, Kapili Hostel** 2017-18
Organised and chaired group discussions, and reworked the hostel library.
- **Head Boy, Gitanjali Devashray** 2013-14
 - **Deputy Head Boy** 2012-13
 - **House Coral Prefect** 2011-12

Extracurriculars

- **Theatre:** Played the **leading role of a child artiste** in a documentary produced by the French NGO Aide et Action. **Directed** and **acted** in the 1st place winning street play at OakFest 2013. Acted in various short films and dramas within IIT Guwahati.
 - **Writing:** As a **Coordinator International Press**, contributed regularly to the IITGMUN conference blog and newsletter. At the **Dell Microsoft Study Buddy contest 2012**, secured a **national level** cash prize in the essay and presentation contest.
 - **Debate:** Participated in numerous MUN conferences and parliamentary debates through the school years.
 - **Sensitization:** Was among 16 students selected from the country to visit the **TERI** centre in Mukteshwar, Uttarakhand. Attended the **EFI** talk 2012, at **Google** Hyderabad.
 - **Sports:** Was among the Inter-IIT basketball probables. Secured 2nd position in the games organized in the freshman week.
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