Scholastic Achievements

- **Ranked 3rd** amongst 64 sophomore students in the Department of Aerospace Engineering.
- **Secured 99.44 percentile** in JEE Advanced 2018 given by over 2,00,000 students across the country.
- Pursuing a minor degree offered by **Systems and Controls Engineering**.

Technical Projects

Autonomous Underwater Vehicle (AUV) | Matsya 5B & Matsya 4C *(Oct' 18 - Present)*

An all-student team that works on the design and development of state-of-the-art AUVs that localizes itself & performs realistic tasks to compete at AUVSI RoboSub,San Diego, CA and NIOT-SAVe, Chennai.
Guide: Prof. L. Vachhani and Prof. Hemendra Arya

- Ideated and integrated an **underwater robotic gripper arm**(weight capacity 1.5kg) with two Degrees of Freedom and analysed its structural and coupled-field stability using Finite Element Analysis on ANSYS.
- Optimised gripping area of gripper by performing various design iterations using SolidWorks and also designed and manufactured a pneumatic based actuating mechanism for marker dropper.
- Designed an **underwater connector** with two-check waterproofing which has current rating upto **80 A**.
- Performed modeling and simulation based **analysis of hyperelastic materials** especially O-Rings using ANSYS software which furnishes the optimal force and pressure required to press the O-Ring(or a hyperelastic material) under given stress and displacement constraints.
- Executed the manufacturing of vehicle components using Industrial processes such as Waterjet Cutting, **Vacuum Impregnation**, **3D Printing**, Welding, CNC Milling and Lathe.
- Developing an **In-air Waterproofing feedback mechanism** to ensure *dynamic* waterproofing of enclosures and chambers up to 50kPa gauge pressure with an estimation on scope of leakage.

Big Data Analytics *(Mar' 19 - Apr' 19)*

Guide: Prof Prabhu Ramchandran, Aerospace Department, IIT Bombay *Course project*

- Inspected and evaluated data using analytical and statistical tools on most popular movies (source IMDB) to discover useful information and aid in business decision making.
- Used various Python libraries(like **NumPy, SciPy, Pandas, Seaborn**) for Data Cleaning, Modeling and Processing to find out correlations, causations and predictions of the variables.
- Applied **linear regression** on consonant parameters in the refined data-set using the statsmodule library.

Line Follower Robot | Electronics & Robotics Club *(Feb' 19)*

- Implemented the **PID algorithm** on for the Line Follower competition with feedback aided by IR sensors.
- Effectively stabilised the controller to achieve optimum **lead-lag compensation** by amplifying its error responsiveness and iterative P I D constants tuning.

RC Plane | Aeromodeling Club *(Oct' 18)*

- Designed and built the fuselage, stabilizers and wings of a miniature aircraft to reduce drag and **enhanced its payload capacity** by improvising the lift.
- Studied different mechanisms and structures of various types of aeroplanes and its control surfaces & learnt the basics of flight control, stability and power of an RC-plane.
- Investigated for designs parameters for **optimum performance and stability** during flight.

XLR8, Bluetooth Controlled Bot | Electronics & Robotics Club *(Aug' 18)*

- Participated in XLR8 and built a Bluetooth controlled car in a team of four. Successfully completed the entire track and achieved the **second position** amongst 120+ teams competing.
- Implemented the electrical and mechanical sub-systems of an RC car using differential steering mechanism and utilized AT Tiny 2313 (IC) for the functioning of the bot.

Technical Skills

- *Programming & Web Development Languages:* **C++| Python | MATLAB | GCode | HTML + CSS**
- *Software Packages:* **ANSYS (Static Structural) | SolidWorks | AutoCAD | LaTeX**
- *Electronic Devices:* **Raspberry Pi | Arduino | NodeMCU**

Positions of Responsibility

Convener | Tinkerers' Laboratory, IIT Bombay *(Apr' 19 - Present)*

Assisted the management of Tinkerers' Lab to promote hands-on engineering at IIT Bombay.

- Orchestrated **Tinkering Weekend**, a series of events to encourage students to explore state-of-the-art technologies, and **TL talks** wherein prominent industrialists deliver talks on innovations in technology.
- Organized Tinkerers' Lab inventory worth **60,00,000 INR** critical to 6000+ students at IIT.
- Promoted advantages of Tinkerers' Lab in the Grand Finale of **Smart India Hackathon** 2019 Hardware Edition at IIT Bombay Nodal Centre televised on **DD National**.
- Managed and conducted training sessions in Tinkerers' Lab every week for training students on machines like 3D Printers, laser cutter, CNC machines and power tools.
- Conducted the visit of **20+ college students from various Asian countries** demonstrating the way in which a lab is managed and explaining about the various startups from the lab.

Mechanical Designer | AUV-IITB, IIT Bombay *(May' 19 - Present)*

Achievements: ***First position*** *in Student AUV competition 2019 organised by National Institute of Ocean Technology under Ministry of Earth Sciences (NIOT-SAVe).*

- Represented the team in the Institute Tech Orientation (Freshman) and RnD Tech Expo demonstrating the feats achieved by the team (total audience 400+).
- Currently **leading** the 'Hulls Sub-System' of team and managing a group of junior fabrication engineers.

Technical Mentor | XLR8, Electronics & Robotics Club, IIT Bombay *(Aug' 19)*

- Guided a team of four members by helping them in modelling and designing the robot of a remote controlled car for XLR8, an obstacle racing freshmen competition.
- Assisted 20+ freshmen teams in debugging the electronic circuits and resolving connectivity issues.

Extra-Curricular Activities

- Involved in spreading awareness about underwater vehicles amongst various technocrats and participants of the **4th World Congress on Disaster Management** organised in Mumbai. *(Jan' 19)*
- Elucidated the working and the scope of utilisation of Autonomous Underwater Vehicles to public, professors and entrepreneurs at the **TechConnect**(TechFest 2018) and **ResTech** technical Exhibitions
- Pursuing **German Communication Course** (2019-20) by International Relations Office, IIT Bombay.
- Industrial visit to **Hindustan Aeronautics Limited** - (Nasik facility) *(Apr' 19)*
  - Exposure to facilities capable of making Sukhoi Su-30 MKI and MiG-21M Aircraft from scratch.
  - Overview of assembly line, manufacturing line and overhaul of Sukhoi Su-30 MKI aircrafts.
  - Live test flight from Air Traffic Control Room, engine and missiles tests.
  - Handled robust aerospace materials including titanium alloys and overviewed its CNC milling machines.
- Administered TL Talk on Innovation and Entrepreneurship by **Prof. John Kojiro Moriwaka**, CEO of Silicon Valley Ventures (SVV), inspiring students with start-ups and business ideas. *(Sep' 19)*
- Completed a year-long intensive guitar course under NSO (Culturals).
- Completed the Prarambh Swimming Camp (2019) by IIT Bombay Sports.