Nakul Randad
Aerospace Engineering
Indian Institute of Technology Bombay

180010047
UG Third Year (B.Tech.)
Male
DOB: 02/07/2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	0.00

Pursuing a minor degree offered by **Systems and Control Engineering**

Academic and Scholastic Achievements

- **Ranked 3**rd amongst 65 students in the Department of Aerospace Engineering
- Awarded **Institute Technical Special Mention**, IIT Bombay for exemplary technical performance *(2019 - 2020)*
- Secured an All India Rank **1389** in **IIT JEE Advanced** | All India Rank **2514** in **JEE Mains** *(2018)*
- One of the top 100 candidates to be selected for **DST-INSPIRE Internship Camp** held at IISER, Pune *(2016)*

Industrial Exposure

Underwater Remotely Operated Vehicle (ROV) for surveillance *(Spring 2020 - Present)*

Larsen & Toubro Defence| DST IMPRINT IIC *Project Guide: Prof. Leena Vachhani*

The project is a joint effort by IIT Bombay and Larsen & Toubro Pvt. Ltd. under IMPRINT IIC scheme of MHRD

- Key member of **mechanical subdivision** of the team working in the design & development of a **Class-1 ROV**
- Created a model for extensive **drag calculations on ROV** to get force estimation for stabilization of vehicle

Positions of Responsibility

Team Member | AUV-IITB, IIT Bombay *(Autumn 2018 - Present)*

An all-student team working on development of AUVs(underwater robots) that localize & perform realistic tasks

Accolades: National Winners, NIOT−SAVe 2019, Chennai | **Semifinalists**, RoboSub 2019, San Diego

Mechanical Head *(Present)*	◇ Co-leading a **3-tier team of 10 members** by maintaining proper work flow and knowledge transfer ◇ Co-authored the **Technical Design Paper** (TDP) of Matsya 6 for **RoboSub 2020** ◇ Designed an **algorithm** to ensure **optimal positioning of thrusters** on a body to ensure all 6 DoF
Mechanical Designer *(2018 - 2020)*	◇ Revamped the design of **chassis** of Matsya 6 | Achieved a **10% reduction in length** of the AUV ◇ Integrated an **underwater robotic gripper arm** (weight capacity 1.5kg) with **two DoF** ◇ Designed a **multi-seal underwater connector** with a current rating: **80 A**; depth rating: **10 m**
Outreach	◇ Presented Underwater Robotics at the **1**st **National Level Technical Symposium** at **IIT Madras** ◇ Elucidated working & utilisation of AUV at the **Tech & RnD Expo, Exhibitions in Techfest**

Department Academic Mentor | Aerospace Department, IIT Bombay *(Jun 2020 - Present)*

- Part of a **19** member team, selected based on extensive interview and peer reviews, which mentors **70+ students**
- Responsible for monitoring the performance of **5 second-year** students providing academic guidance and counsel

Technical Convener | Tinkerers' Laboratory, IIT Bombay *(Autumn 2019 - Spring 2020)*

*A 24*7 'Makerspace' for innovators; open to all the students to promote hands on learning experience*

- Orchestrated **Tinkering Weekend** & **TL Talks** wherein industrialists deliver talks on innovations in technology
- Organized Tinkerers' Lab inventory worth **6 Million INR** critical to 6000+ students at IIT Bombay
- Initiated monthly **Do-It-Yourself (DIY) projects** and brainstormed with the participants to develop prototypes

Key Projects

Solar Radiation Prediction | Course Project | Prof. Biplab Banerjee, CSRE, IIT Bombay *(Spring 2020)*

- Predicted hourly Solar Radiation using **SVM** ML model with MAPE of **20**% and compared with **NN** based model
- The MLP architecture in NN has **3 layers with ReLU activation** and **RBF kernel** is used in SVM classification

Big Data Analytics | Course Project | Prof. Prabhu Ramchandran, Aerospace Department, IITB *(Spring 2019)*

- Employed analytical tools on most popular movies(IMDb) to predict movie ratings & aid business decision-making
- Used various Python libraries(like **NumPy, SciPy, Pandas, Seaborn**) for data cleaning, modeling and processing

Topological Data Analysis | Prof. Debasish Chatterjee, SysCon, IIT Bombay *(Summer 2020)*

- Studied **Group Theory** and **Topology** (Simplicial Complexes) to analyse biological and ecological parameters
- Worked on novel Topological Methods for data-driven estimation and analysis using **GUDHI package** on Python

Skills & Extra Curricular Activities

Technical	• Programming: **Python, C++, MATLAB** | Software: **Solidworks, ROS, ANSYS, Simulink**
Declamation	• Propagated use of underwater vehicles at the 4th World Congress on **Disaster Management** • Demonstrated utility of TL machines to army school students & officers from SriLanka&Nepal
Miscellaneous	• Pursued **German Communication Course**(19-20) by International Relations Office, IIT Bombay • Industrial visit to **HAL** (Nasik facility): overview of assembly line and overhaul of aircrafts
Sports	• Completed the Guitar course (NSO 2018-19) and Prarambh Swimming Camp by IITB Sports