Aayush Shah | **190100003**
Mechanical Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 14-01-2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2023	
Intermediate	CBSE	Green Valley High School	2019	96.40%
Matriculation	CBSE	Navrachana Higher Secondary School	2017	10

- Pursuing minor in Computer Science with a minor **CPI of 10**

Scholastic Achievements

- Secured All India Rank **222** in JEE Main amongst 9.3 lakh candidates ['19]
- Secured All India Rank **779** in JEE Advanced amongst 1.73 lakh candidates ['19]
- Achieved **100%** accuracy in the Australian National Chemistry Quiz (ANCQ) ['16]

Publications

- Katla V., **Shah A.** et al. "An Approach to Star Tracker Design for Nano-Satellite Applications" extended abstract presented in National Conference on Small Satellite Technology and Applications, Trivandrum, India, 2020

Technical Projects

IIT Bombay Student Satellite Program [Jan '20 - Present]

A 70-membered student team dedicated to making IIT Bombay a centre of excellence in space technology

Mechanical Subsystem | Star Tracker Attitude Determination System

A CubeSat-compatible Star Tracker-based Attitude Determination System (STADS) to be tested onboard the PS4-OP

- Conceptualised and designed multiple mechanical configurations for STADS using **SolidWorks** and analysed one after comparing various perspectives being modelling, simulations, manufacturing and integration practices
- Performed static and harmonic analysis of the STADS module on **ANSYS** Workbench for PSLV's launch loads
- Simulated the harsh space environment by performing transient & steady-state **thermal** simulations on ANSYS

Developing machine learning algorithms for detecting flow structures [June '21]

Guide: Prof. Atul Shrivastava, Dept. of Mechanical Engineering, IIT Bombay

- Analysed research papers on **Physics Informed Neural Networks (PINN)** to extrapolate flow parameters
- Examined neural network architectures to detect bubble formation in pool boiling experiment data
- Implemented the **Canny edge detection algorithm** on Schlieren images using **OpenCV** in Python

Gripper system for laser additive manufacturing | Course Project [June '21]

Guide: Prof. Ramesh Singh | Manufacturing Processes

- Benchmarked patents of **10+** existing gripper systems and identified major issues assosciated with them
- Modelled a suitable design using **SolidWorks** for automating the use of a laser head in additive manufacturing
- Simulated the design in **ANSYS** with different materials and analysed the results for best performance

Facial Recognition System | Course Project [May '21]

Guide: Prof. Abir De | Introduction to Machine Learning

- Built a facial recognition algorithm based on FaceNet using **TensorFlow** and Python libraries **Pandas and Numpy**
- Implemented a **Convolutional Neural Network** to create embeddings of images from YouTube Faces Database
- Optimised the neural network using the novel **triplet loss** to achieve an accuracy of **90%** on the test set

Quantum Computing Workshop [July '20]

Maths And Physics Club, IIT Bombay

- Implemented quantum circuits in **IBM Qiskit** to solve problems of cryptography and quantum teleportation
- Studied the principles behind the **Grover's algorithm** for sorting and executed a quantum circuit for the same

XLR8 Bot | Bluetooth Controlled Electric Car [Aug '19]

Electronics and Robotics Club, IIT Bombay

- Built a remote control bot in a team of **4** to overcome several obstacles and maneuver over rough terrains
- Designed a lightweight, compact wooden chassis that used **differential mechanism** and the L293D motor driver

Entrepreneurial Project

Co-Founder | Nyus [July '20 - Feb '21]

An app which provides trending news in the form of memes

- Managed the content division consisting of **10+** interns and spearheaded their recruitment and training
- Ideated design and features of the app and secured **15k+** downloads on the Play Store in 8 months
- One of five teams to get selected for preincubation out of **50+** applications by the IDEAS Program hosted by Desai Sethi School of Entrepreneurship, resulting in a grant of **Rs 2 Lakh** and networking with investors and mentors

Software Skills

Programming	C++, Python
Simulation and CAD	ANSYS, AutoCAD, SolidWorks, Octave, MATLAB, Abaqus
Web Development	HTML, CSS, Django

Positions of Responsibility

Editor | Mechanical Media [April '21 - Present]

Editorial board of the Mechanical Engineering department and an independent segment of council with 30+ members

- Selected into a team of **5** out of **20+** applications through an evaluation process involving ethics and peer reviews
- Ideated content of blogs and magazines circulated among **1000+** readers aiming to popularize mechanical engineering

Subsystem Head | Mechanical Subsystem [July '21 - Present]

IIT Bombay Student Satellite Program

- Executed a **3-step recruitment process** to evaluate and select 10 students out of **100+** applicants
- Supervised an interdisciplinary team of **15 students** to develop structural and thermal design of space systems
- Ensured implementation of the **Quality Assurance** practices for the subsystem to maintain reliability

Mentor | FinSearch [July '21]

A project based financial research program

- Mentored **4** teams for a project and case study involving trading of currencies and commodities in the market
- Executed a **two month** long learning structure aimed at providing the fundamentals of stock market and trading

Key Courses Undertaken

Computer Science	Introduction to Machine Learning, Computer Programming and Utilisation
Mechanical	Fluid Mechanics, Manufacturing Processes I and II, Thermodynamics, Solid Mechanics
Math	Linear Algebra, Introduction to Numerical Analysis, Calculus, Differential Equations

Extracurricular

Writing

- Published an article on **'The Student Satellite Project'** in the department newsletter for **300+** readers
- Contributed to an article on **'Adjustment Period between first and second year'** for **Insight** [April '20]

Piano

- Performed in school concert orchestra with a footfall of **500+ audience**
- Secured **first** position in AVV Interschool Band Competition among **17** participating schools ['16]
- Performed in **Surbahaar**, IIT Bombay's flagship musical event, in front of an audience of **1500+** [Oct '19]

Sports

- Successfully completed a yearlong training in **swimming** under (NSO)-Sports ['19]
- Awarded the **blue belt** in Karate - Kan Zen Ryu after qualifying a three stage evaluation process