Rhythm Shah | **190110074**
Metallurgical Engineering and Materials Science | **B.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
DOB: 23-10-2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2023	
Intermediate	CBSE	Sanskar Public School	2019	91.40%
Matriculation	CBSE	St. Paul's School	2017	100.00%

*Pursuing a **Minor** in the **Centre for Machine Intelligence and Data Science (C-MInDS)***

Internship

Data Science Intern | Think North Consultancy *[Jun 2021 - Present]*

- Implemented **automated web scraping** of 1k startups using Selenium, incorporating multithreading via maps, performed **Exploratory Data Analysis (EDA)** to find trends in fundraising and their variation with temporal and categorial factors
- Built a **forecasting model** to predict trends in an upcoming domain's fundraising based on patterns in more mature domains

Journal Publication

Metabolome and exposome profiling of the biospecimens from COVID-19 patients in India; approved by the reviewers for publication in the **Journal of Microbiology, Epidemiology, and Immunobiology** Impact Factor - 4.399

Research Experience

Plasma metabolome big data analysis in COVID-19 patients | iSURP *[Oct 2020 - Feb 2021]*

Prof. Sanjeeva Srivastava | *Department of Biosciences and Bioengineering*

Host metabolite profiling defined blood markers that provided mechanistic insights into COVID-19 pathogenesis and effectively specified different complications of COVID-19

- Conducted literature study and shortlisted various packages in **R** for analysis and annotation of outlier metabolites
- Analysed exposome data for severe to non-severe patients to obtain the outlier metabolites which were similar among these patients using **R and Excel** for QC checks and Fold Change analysis, resulting in **plots for visualisation**
- Used Metaboanalyst Software for the normalization of features with more than 70% of data available and performed T-test and Fold Change Analysis with p value<0.05 and fold change>1.5, generating volcano plots for visualisation
- Authored workflow of above-mentioned **Statistical Analysis** under Materials and Methods section of the Manuscript

Technical Projects

IIT Bombay Racing *[Mar 2020 - Jul 2021]*

A 3-tier cross-functional team of 70+ passionate students which designs and assembles a formula-style electric race car for Formula Student UK, an international race car designing competition organized by IMechE

Junior Design Engineer | Battery Management System (BMS)

- Analysed battery modelling packages in **MATLAB** to estimate cell parameters using voltage v/s current dataset
- **Redesigned** Charger PCB, with introduction of connectors to incorporate CAN communication protocol in the board
- Part of a **15 member** contingent representing the team in **FSEV** Challenge 2021, an Electric Vehicle Concept Competition; assisted in drawing up **Electrical Design Presentation** and **Failure Mode Effects Analysis(FMEA)** Report
- **Mentored** 5+ trainees to help them understand team culture and basics of functioning of the electrical package

Electrical Subsystem Trainee | Battery Management System (BMS)

- Gained insights on electrical subsystems in **Data Acquisition-CAN**, **HV** and **BMS** and their functioning in the car
- Studied State of Charge and State of Health estimations of cells along with CAN Bus topology, time interrupts, shutdown circuits and OP-AMP circuits. **Designed** basic electrical circuits on **EAGLE**
- Encoded instructions on **Arduino** to implement a mini-BMS for monitoring voltage and temperature values of 2 cells to ensure safe and proper functioning of cell within safe operating conditions and produce an error otherwise
- Comprehended the design and manufacturing of Battery and its in-house built Management System

Handwritten Digit Recognition | Course Project *[Mar 2021 - Apr 2021]*

Prof. Biplab Banerjee | DS 303 - Introduction to Machine Learning

- Developed the model using the **Support Vector Machine(SVM)** algorithm provided in the sklearn module of python.
- **Trained** the SVM on 10k data points from Modified National Institute of Standards and Technology(MNIST) dataset
- **Examined** trained model on 2k data points using different kernels and increasing accuracy from 93% to **97%**

Automatic Clothes Folding Machine | Course Project *[Mar 2021 - Apr 2021]*

Prof. Shantanu Tripathi | ME 220 - Theory of Machines and Machine Design

- Identified problems with lack of automation in commercial and of cost and mobility with industrial cloth folding machines for Indian households and redesigned the machine incorporating **automation** and **smaller footprint** as a **solution**
- Modelled **working prototype** and **FEA** using **SolidWorks**; Conducted **FMEA** and motion & stress analysis in **MSC Adams**

Smart Mirror Technology | Institute Technical Summer Projects *[Apr 2020 - Jul 2020]*

- Executed **face recognition** to boot up UI and an interactive system controlled using an array of **hand gestures** to slide between personalised notifications built using HTML and CSS as tools of Web Development
- Enhanced the system to **automatically detect** the presence of masks from a **live video feed** using OpenCV which works on a trained Deep Learning model, using TensorFlow and Keras for Face Recognition with an accuracy of **99.22%**
- Built these features as modules for MagicMirror, an **open source** smart mirror platform, that can run independently on Raspberry-PIs Raspbian OS for installation in two-way mirrors with an LCD panel and a camera module

Food Recommendation through Machine Learning | Seasons of Code *[Apr 2020 - Jun 2020]*

- Android app that provides interface to choose food recipes and create cooking schedules aiding the users to overcome decision making tasks; worked in a **team** of selected 16 students
- Developed **back-end** for creating schedules, using personalized recommendations through machine learning by using **REST APIs**, SQlite database management and **Django** web framework

Key Courses Taken

Core Courses
Data Analysis and Interpretation, Computer Programming and Utilization, Theory of Machines and Machine Design, Introduction to Numerical Analysis, Sociology

Other Courses
Introduction to Machine Learning, Programming for Data Science, Data Structures and Algorithms(SoS), Computer Networks, MicroEconomics(edX)

Technical Skills

Programming Languages:
C++, Python, MATLAB, Arduino

Libraries & Utilities:
OpenCV, Selenium, Haar Cascades, NumPy, Git, Django, HTML, CSS, Bootstrap, ESP32

Softwares & Platforms:
AutoCAD, SolidWorks, EAGLE, Adobe Illustrator, Windows, Ubuntu (Linux)

Extracurricular Activities

- Member of **Toastmasters International** Club; awarded **best speaker** *[Jul 2020 - Oct 2020]*
- Completed the **Virtual Stock Market** (VSM) - Workshop and Simulation Competition organised by E-Cell *[Sep 2020]*
- Completed a year-long course under the National Sports Organization (NSO) in **Football** *[2019 - 2020]*
- Represented Hostel 9 in 4.2 km long **Crossy General Championship** *[2020]*
- Participated in **PlutoX Hackathon** organised by Aeromodelling club, IIT Bombay in collaboration with Drona Aviation, **programming** a drone to successfully complete the given problem statement *[Jan 2020]*
- Successfully completed **Design Bootcamp** by Learners Space to become proficient in **Adobe Illustrator** by gaining basic Illustrator skills, knowledge of Vector Drawings and Isometric Illustrations *[Jul 2020]*
- Successfully completed **Tinkering Bootcamp** by Learners Space to become proficient in working with Arduino, ESP32 and Python libraries including **haar cascades** and basics of **web scraping** *[Jul 2020]*

Scholastic Achievements

- Secured **Department rank 5** in a class of 104 in the B.Tech programme *[2019 - 2020]*
- Selected to compete in **Regional Mathematical Olympiad (RMO)** conducted by **HBCSE**, GoI *[2018]*