Dhruv Rambhia | **200050115**
Computer Science & Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 3/25/2003

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	
Intermediate	Maharashtra State Board	PACE Junior Science College Andheri	2020	97.23%
Matriculation	Maharashtra State Board	Dr. S. R. Vidyalaya, Malad	2018	95.20%

Pursuing **Minors** in **Machine Intelligence and Data Science** and **Honors** in **Computer Science and Engineering**

Scholastic Achievements

- Secured **All India Rank 43**rd out of **250k candidates** appearing for *JEE Advanced 2020* examination *(2020)*
- Obtained **99.99** percentile and secured **All India Rank 158** in *JEE Mains 2020* among **900k candidates** *(2020)*
- Among India's **top 46** students selected for *Orientation Cum Selection Camp (Chemistry)* after clearing the *Indian National Chemistry Olympiad* conducted by the *Homi Bhabha Centre for Science Education* *(2020)*
- **Science stream rank 1** among **1.5M** students appearing for *HSC Board Examinations* in Maharashtra *(2020)*
- **Third Runner Up** among **560**+ teams of 4 from across India in *Mimamsa Quiz 2021* by IISER Pune *(2021)*
- Selected among **top 35** from Mumbai region on clearing *Regional Maths Olympiad*, conducted by *HBCSE* *(2018)*
- Ranked **9**th in Mathematics Olympiad 2k17 conducted by *Mathematics Association of IIT Bombay* *(2017)*

Work Experience

Research Intern | *Internship* *(May '22 - July '22)*
Technische Universität Braunschweig

- Studied the **Simulator for Mobile Networks (SiMoNe)**, a Systems level Simulation tool designed at TU Braunschweig to emulate the mobile networks in urban regions as realistically as possible for a variety of applications
- Studied the local area network traffic produced by *ECG vests* and modelled it using statistical methods to fit the data models available in SiMoNe to expand the scope of the simulations by incorporating new verticals
- Working on writing a **conference paper** describing the methods and results obtained by the **data analysis**
- Received a letter of recommendation from **Dr. Thomas Kürner** for the work done during the internship

Research Intern | *Internship* *(May '22 - July '22)*
Indian School of Business, Mohali

- Studied the dynamics and evolution of the **sharing economy** while briefly exploring portions of **Contract Theory**
- Studied in details papers on **Liminal Movement** by *Uber Technologies* and how it overcame regulatory challenges in different cities as well as the fate of the service in the diverse markets of the US, Sweden and Germany
- Worked on some personal projects of **Dr. Francis B. Kim** and received a letter of recommendation from him

Key Projects

Machine Learning | *Summer of Science* *(May '21 - July '21)*
Maths and Physics Club, IIT Bombay

- Finished a **61 hour** online course on Machine Learning from **Stanford University** by **Dr. Andrew Ng**
- Studied the **machine learning pipeline, steps in evaluating the model** besides learning core machine learning algorithms such as **K-Means, Neural Networks, SVMs, Recommender Systems, Anamoly detection etc.**
- Developed several machine learning models in *GNU Octave* and trained them as part of the course including a **3 layer feedforward neural network** trained to recognize numerical digits from the *MNIST* database
- Compiled a **93-page detailed report** on the content covered and work done as a part of the course coupled with a **rigorous presentation** on the extra technical details of the topic *principal component analysis*

Stochastic Processes | *Summer of Science* *(ongoing)*
Maths and Physics Club, IIT Bombay

- Revised the fundamentals of **statistics and probability** and studied the fundamentals of **stochastic processes** such as concept of *process means*, *covariance* and *correlation*, *stationary processes*, *calculus of processes*, etc.
- Studied the different kinds of stochastic processes such as the **Gaussian random process, Poisson process** and **Wiener Processes** with a special focus on discrete as well as continuous time **Markov Processes**

Illustrating NMR concepts using simple interactive Python apps | *Summer Undergraduate Research Program* *(May 2021 - July 2021)*
Guide: Prof. Ishita Sengupta, Department of Chemistry

- Studied theory on **Nuclear Magnetic Resonance** from a book by *Malcolm Levitt* and *James Keeler* along with analyzing a previously written research paper on the topic, published in the *Journal of Chemical Education*
- Implemented the contents of some of these sections demonstrating crucial concepts of NMR such as superposition and signal averaging visually as **Python** codes to be used for the education of future students of the subject

Course Projects

Socket Programming | *Computer Networks* *(Spring '22)*
Instructor: Prof. Kameswari Chebrolu

- Implemented a **P2P network** in **C** in which clients could **search and download files** present on the other nodes in the network by advertising their own files and establishing **TCP connections** with the relevant peers.

Online Pictionary Game | *Software Systems Lab* *(Autumn '21)*
Instructor: Prof. Amitabha Sanyal

- Developing a **browser based game** based on the popular game 'Pictionary' in a **team of 4** using tools such as **Django, socket.io, CSS, etc.** to make it reach in features such as **chatting, profiles and high scores**

Image Segmentation | *Medical Image Computing* *(Spring '22)*
Instructor: Prof. Suyash Awate

- Studied a recent research paper and performed a comparative study of modern **supervised and unsupervised learning based image segmentation techniques**, in particular **K-Means** and **Deep Neural Networks**
- Implemented a **Deep Neural Network** based on the **U-Net** architecture and presented the results on a dataset provided by the **International Symposium on Biomedical Imaging cell tracking challenge**.

Rush Hour | *Logic for CS* *(Spring '22)*
Instructor: Prof. Ashutosh Gupta

- Implemented a script in **Python** using **Z3Py** to read the configuration of the game board from a text file, model the game as a SAT problem and solve the *Rush Hour* puzzle with the given constraints with highest possible efficiency

Relevant Courses

Mathematics	Calculus I and Calculus II, Linear Algebra, Ordinary Differential Equations, **Mathematical Optimization Techniques**
Computer Science	Software Systems Lab, Data Structures and Algorithms, Data Analysis and Interpretation, Computer Networks, Computer Architecture
Electrical Engineering	Introduction to Electrical and Electronic Circuits, **Signal Processing**
Misc.	Economics, Modern Physics, Electromagnetism, Engineering Drawing
Self Learning	Machine Learning, **Financial Markets**

Positions of Responsibility

Department Academic Mentor | *Student Mentorship Program* *(ongoing)*

- Selected as an **academic mentor** under the Department Academic Mnetorship Program for juniors as one of **30** sophomores out of **64 applicants** after a rigorous procedure consisting of **SoP, peer reviews and interviews**
- Helping out a group of **6** junior students in navigating academic and personal difficulties as well as helping out the DAMP team in work such as **organising guidance sessions**, **giving talks** and **preparing resources**

Teaching Assistant | *Department of Physics* *(December '21 - March '22)*
Prof. Shankarnarayan

- Selected to be a teaching assistant to the professor for the introductory course on **Quantum Mechanics** after a rigorous shortlisting based on **academic performance, SoP and an interview**
- Tutored a batch of **41 juniors** weekly, corrected their examination papers and aided the instructors with logistics

Summer of Science Mentor | *Maths and Physics Club, IIT Bombay* *(May '22 - July '22)*

- Selected to mentor **6 students** in their *Summer of Science* projects on the topic **Data Structures and Algorithms**
- Provided the mentees with **resources and guidance** to learn the topic as well as prepare their presentations

Extra-curricular Activities

- Played for the **runner-up** team in an inter-department **football league** organized by the **CSE Association**
- Part of the team which got **second place** in the **Jhatka GC** organised by the **Electronics and Robotics Club**
- **Winner** of **Bazinga Physics Quiz 2021** organised by the **Maths and Physics Club** of IIT Bombay
- **First prize** in an institute-wide **essay writing competition** on India's Freedom Struggle as part of India's 75^{th} Independence Day celebrations as per directives of the Ministry of Education, Government of India