Sameep Chattopadhyay   20D070067
Electrical Engineering   **Dual Degree (B.Tech. + M.Tech.)**
Indian Institute of Technology Bombay   **Gender: Male**
                                                            DOB: 10/2/2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2025	
Intermediate	CBSE	Kendriya Vidyalaya IIT Powai	2020	97.00%
Matriculation	CBSE	Kendriya Vidyalaya IIT Powai	2018	95.80%

Pursuing minor in **Artificial Intelligence and Data Science**

Scholastic Achievements

- Ranked **6th** out of **100** students enrolled in the Dual Degree program of Electrical Department — *2021*
- Secured All India Rank of **355** in **JEE Advanced** out of **0.15 million** candidates — *2020*
- Achieved **99.85%** percentile in **JEE Main** amongst **1.1 million** candidates — *2020*
- Among the top **802** students in India selected for **Indian National Chemistry Olympiad** — *2020*
- Recipient of Kishore Vaigyanik Protsahan Yojana (**KVPY**) fellowship with All India Rank **663** — *2019*
- Awarded Kendriya Vidyalaya Sangathan **Top 1.5% Merit Award** both in class 10 & class 12 — *2018 & 2020*

Professional Experience

Data Science Intern | Siemens Ltd.   *May'22 - Jul'22*
Anomaly Detection in Energy Meter Data
- Studied the working of Siemens Energy Management Systems and Global Monitoring Systems for **KPI tracking** and **process benchmarking** for sustainable and energy efficient manufacturing in the times of **Industry 4.0**
- Ideated on algorithms for **anomaly detection** in data and solutions for **data quality validation** & improvement
- Performed **Time Series Analysis** and implemented numerous **SARIMA** models on real world industrial data
- Developed and **optimized** a python program for **JSON** scraping, anomaly detection & **data cleansing** and explored the application of ticketing systems and unsupervised clustering methods like **DBSCAN** for automation

Technical Projects

Facial Feature Detection with fastai   *Apr'22 - May'22*
Course Project | Guide: Prof Biplab Banerjee, Centre for Machine Intelligence & Data Science, IIT Bombay
- Demonstrated the usage of **fastai** library as a faster and more efficient computational tool for feature extraction
- Performed **image augmentation** and applied facial detection methods in order to identify the faces in an image
- Extracted facial features using the **cnn_learner** transfer learning method in fastai and initialized it with **resnet18** to utilize the features to calculate inter-feature distance and perform facial recognition on the **LFW dataset**

Cardiovascular Disease Prediction   *Oct'21 - Nov'21*
Course Project | Guide: Prof Amit Sethi, Centre for Machine Intelligence & Data Science, IIT Bombay
- Applied **data pre-processing** techniques in order to identify outliers and cleanse the data for further usage
- Performed Exploratory Data Analysis (**EDA**) to identify the major factors responsible for causing cardiac diseases
- Implemented Machine Learning & Deep Learning Models based on **KNN, SVM, RF, Decision trees, Naive Bayes & Neural Networks** in order to predict whether an individual is suffering from a cardiovascular disease

Distributed Beamforming Using Drone Swarm Network   *Jun'22 - Present*
Research Project | Guide: Prof Dwaipayan Mukherjee & Prof Sashi Ranjan Kumar, IIT Bombay
- Analyzed potential solutions and submitted a proposal to the **ISRO** Telemetry Tracking and Command Network
- Performed literature survey to gain knowledge on **wireless networks** and **beamforming analysis** techniques
- Working on implementation of **particle swarm** optimization algorithms for co-operative control in UAV swarms

Student Satellite Program | IIT Bombay   *May'21 - Jun'22*
A 70-member student team with the vision of making IIT Bombay a centre of excellence in space technology
  Great Lunar Expedition for Everyone (GLEE) | Instrumentation
  An initiative by the University of Colorado (CU Boulder) to send 500+ ChipSats to the surface of Moon by 2023
- Involved as a member of the team to design a **5cm × 5cm** ChipSat, which would be sent to the lunar surface
- Contributed to the development of **readout circuitry** for the PIN Diode based spectroscopy sensor of Chipsat
- Surveyed literature on radiation detection and analyzed the data obtained from the **Chandrayaan-2 XSM**
- Presented the project *"Lunar Exploration through ChipSats"* at International Conference for Small Satellites-2022

Movie Recommendation System
Seasons of Code | Web and Coding Club, IIT Bombay   *May'21 - Jul'21*
- Employed python libraries like **Pandas, NumPy, SciPy, Scikit-learn**, and **PyTorch** to perform data analysis
- Analyzed the usage of **linear & logistic regression** in prediction tasks and **PCA & K-Means** in clustering
- Developed a movie recommendation system based on **KNN** algorithm for content based collaborative filtering

Computer Vision
Summer of Science | Maths and Physics Club, IIT Bombay   *May'21 - Jul'21*
- Implemented **image manipulation** algorithms like blurring, sharpening and thresholding using **OpenCV** library
- Scrutinized **gradient descent, adam optimizer & backpropagation** as the building blocks of deep learning
- Explored Neural Networks and application of **Convolutional NN** in the multi-class image classification problems

Multicycle Processor Design
Course Project | Guide: Prof Virendra Singh, Dept. of Electrical Engineering, IIT Bombay   *Apr'22 - May'22*
- Designed a multicycle datapath using **VHDL** for the instruction set of a **16-bit** computer named IITB-RISC
- Modeled an **FSM** controller using **behavioral modeling** and performed **RTL** simulations on datapath & FSM
- Enhanced the design in order to perform **17** different instructions including conditional, immediate and branch

Digital Logic Design in VHDL
Course Project | Guide: Prof Maryam Baghini, Department of Electrical Engineering, IIT Bombay   *Jul'21 - Nov'21*
- Utilized **behavioral** modeling to design an **FSM** that can detect a specified word in a string of letters
- Designed components like 4×1 MUX, 3 to 8 Decoder, Multiplier & Universal Shifter using **structural** VHDL
- Verified designs by performing simulations on all possible inputs using **scan chains** on Krypton board

Information Theory
Summer of Science | Maths and Physics Club, IIT Bombay   *May'22 - Present*
- Studied about **Measure Theory** and Shannon's Information Measures like **entropy** & **mutual information**
- Explored the concepts behind **data compression** and learned various **information encoding** techniques

Positions of Responsibility

Manager | EE Alumni & Corporate Engagement
Jun'22 - Present
- Leading a team of **4** student coordinators to enhance the engagement between alumni and the department
- Organized a day-long department lab tour and exhibition for **70+** IIT-B Alumni and their family members
- Hosted a gathering of **15 IAS Officers** and showcased the numerous initiatives going on in the department

Department Alumni Secretary | Student Alumni Relations Cell
Jun'21 - Jun'22
- Awarded the **Organizational Special Mention 2021-22** by the Department of Electrical Engineering for the notable organizational contribution to the department under my tenure as the alumni secretary
- Brought in **80+** internship projects floated by the IIT Bombay alumni through **Industrial Learning Program**
- Conducted **Placement Mentorship Program (PMP)** with **600+** final year students & **150+** alumni mentors

Teaching Assistant | Calculus II
Feb'22 - Mar'22
- Selected as a part of a team of undergraduate TAs to facilitate the execution of the course for **1400+** students
- Held weekly tutorial sessions for **40+** students to help them better understand the concepts taught in the lectures

Technical Skills

Programming Languages	Python, R, MATLAB, SQL, C++, VHDL, Embedded C, Assembly, HTML
Software Packages	Node-Red, MYSQL, LTspice, Ngspice, Quartus, GNU Radio, Github, MS Excel
Python Libraries	NumPy, Scipy, Pandas, Seaborn, OpenCV, Scikit-learn, TensorFlow, PyTorch

Key Courses Undertaken

Electrical Engineering	Introduction to Electrical Engineering, Signal Processing, Analog Circuits, Digital Systems, Probability and Random Processes, Control Systems, Electronic Devices, Microprocessors, Power Engineering I & II, Markov Chains & Queuing Processes
Computer Science & Data Science	Computer Programming & Utilization, Programming in Data Science, Introduction to ML

Extracurricular Activities

- Studying **Financial Markets** and **Big Data Handling** under Learners' Space, IIT Bombay   *2022*
- Completed a year long training in **Dramatics** under the **NSO** program of IIT Bombay   *2020-2021*
- Participated in **Kaladarshan**, the annual **Art & Photography Exhibition** of IIT Bombay   *2021*
- Hosted the **Battle of the Bands** competition during the **Mood Indigo**, IIT Bombay   *2020*
- Awarded **Best Speaker** at Regional Youth Parliament by the Ministry of Parliamentary Affairs   *2017*
- Attended the 23rd **National Children's Science Congress** (Intra-Regional Level)   *2015*