Praveen

Electrical Engineering

Indian Institute of Technology Bombay

22B3931

Dual Degree (B.Tech. + M.Tech.)

Gender: Male

DOB: 17/08/2005

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2027	
Intermediate	RBSE	Saint Bright Moon public school	2021	96.80%
Matriculation	RBSE	Saint Bright Moon public school	2019	87.50%

Pursuing a **Minor Degree** in **Artificial Intelligence and Data Science** offered by CMInDS, IIT Bombay

SCHOLASTIC ACHIEVEMENTS

- Achieved a position in **Top 1.65%** students in JEE Advanced, competing against about **2.5 lakh** candidates [2022]
- Secured a percentile of **99.74** in JEE Mains examination **among 10+ Lakh candidates** across the country [2022]
- Achieved **AA (10/10) Grade in 12 Courses** including Artificial Intelligence and Data science courses [2022-2024]
- Achieved an SPI (Semester Performance Index) of **9.85/10** in 4th semester [2024]

RESEARCH EXPERIENCE

Optimizing Deepfake Detection with Shearlet-Driven Transformers [Dec'23 - Jul'24]
UIDAI | Prof. V.M Gadre| Enpower| IIT Bombay

- Implemented **Diffusion Model** and **Vision Transformer** to generate and classify Real and Deepfake fingerprints
- Conducted research on integrating **Shearlet** based **Directional feature** with **Self attention** mechanism, significantly **Reducing training epochs**, Achieved **96% Accuracy** and Submitted **2 Research papers** in **ICASSP 2025** summit

KEY PROJECTS TAKEN

Quantitative Asset Optimization & Volatility Forecasting [Oct'24 - Nov'24]
Prof. Avinash Bhardwaj| IE501| Course Project

- Formulated a **linear programming** to maximize returns constrained on **Conditional Drawdown at Risk (CDaR)**
- Implemented optimization model using **IBM CPLEX** solver for **10 S&P 500 tickers**, validating results on historical data
- Predicted future prices using **LSTMs**, tested portfolio performance, and analyzed metrics including the **Sharpe ratio**

Predictive Analytics and Big Data Handling [Aug'23 - Nov'23]
Prof. Vinay Kulkarni| DS203| Course Project

- Completed Projects like **Predicting the Stock prices** & **Production levels**, **Rainwater possibility** and **IPL prediction**
- Mastered concepts like Vectorization, EDA, PCA, Regression, Classification, **Time Series analysis** and Neural Networks
- Acquired familiarity with **(GCP) Google Cloud Plateform**, Apache Spark, Hadoop and **SQL** for Big data handling

NLP-Driven Depression Assessment in Tweets [Dec'23 - Jan'24]
Winter in Data Science| Analytics club| IIT Bombay

- Developed Sentiment Analysis model for Tweets, enriched with Text Processing such as **Stemming & Lemmetization**
- Trained on tweets data using both **LSTM** and **BERT** models to understand their workings and performance
- Assessed performance using **Precision, Recall, and F1-score**, correctly identifying **93% cases of Potential risks**

Conversational AI for Document Interaction | Self project [Nov'23-Dec'23]

- Developed a PDF chatbot using **LangChain** and **RAG Pipeline**, facilitating seamless interaction with PDF documents
- Leveraged Hugging Face Embedding, FAISS and Conversational Buffer Memory for data retrieval from PDF
- Implemented **LLama 2** as **Large Language Model**, allowing users to upload documents and perform queries

Pairs Trading using Kalman filter | Self project [Dec'24 - Jan'25]

- Developed a pairs trading strategy using **Kalman Filtering** and generate buy/sell signals for **ADBE and MSFT**
- Conducted **Cointegration test** to identify correlated pairs, using moving averages, ROC, & volatility for model training
- Backtested the strategy on historical data, simulated trades, and evaluated **Cumulative PnL** to measure performance

Predictioneer | Data Science Hackathon [Dec'23 - Jan'24]
Azeotropy | Chemical engineering symposium| IIT Bombay

- Secured the **2nd position** nationwide, solving the Problem statement of **Predicting the future Waterlevels**

Hospital Management Portal for IITB Hospital | Self project   [Aug'23 - Nov'23]

- Developed a user-friendly **Student app**, a dynamic **Staff website**, and a robust **Administrative backend** for doctors
- Utilized **Django** for the administrative backend and **ReactJs** for the frontend, integrated with **SQLite database**
- Implemented **Django REST framework** and **WebSocket** for real-time and seamless data exchange across applications

Trade Execution and Management System for Deribit | Self project   [Nov'24]

- Made a **Crypto trading system** using **Deribit APIs** with features like order placement, cancellation, and modification
- Implemented features to retrieve order books and monitor positions across all supported symbols with **Low latency**
- Built a **WebSocket server** allowing clients to subscribe to specific symbols, enabling real-time updates for symbols

POSITION OF RESPONSIBILITIES

Subsystem Lead | Controls | EXOFLY   [Apr'24 - Present]
A team of 50 + tech enthusiasts with a shared vision to design Manned Aerial Vehicles

- **UAS COMPETITION:** Engineered a high-performance drone capable of efficiently **Delivering payloads** up to **2 Kgs**, integrating Pixhawk controller, GPS, Telemetry and Servos and Successfully completed flight testings
- Implemented **OpenCV** projects including **Object Detection using YOLO**, Distance and **Pose Estimation** of Object
- Implemented **Path planning** algorithms including **Dijkstra** and **A star** algorithm to make drone flight Autonomous

Web Coordinator | Techfest   [Aug'23 - Dec'23]
Asia's largest Science and Technology festival hosted by IIT Bombay with a footfall of over 1.75 lakh people

- Contributed in the website for Techfest, IIT Bombay, leveraging **React for frontend** and **Django for backend**
- Incorporated a **Live Betting Portal** within the Techfest website, allowing **Real-Time Interaction** and involvement

Student Mentor | Gen AI | Seasons of Code   [May'24 - Jul'24]
Web and Coding Club | Institute technical council | IIT Bombay

- Guided students in understanding and implementing the Architecture of **LDM (Latent Diffusion models)** and **DDPM**

CERTIFICATIONS

Data Structures and Algorithms   [May'24 - July'24]

- Implemented Sorting, Searching & paradigms like **Dynamic programming, Greedy algorithms** and **Backtracking**
- Proficient in **Trees** (binary trees, binary search trees) and graph algorithms including **BFS, DFS, Dijkstra's and A star**

Introduction to Cyber Security | Cyber security club   [June'24 - July'24]

- Developed proficiency in using the **pwntools** in Python and **Linux** to automate interactions with executable files
- Automated the **solution of 240 sudokus** in a CTF challenge, successfully obtaining the flag through efficient scripting

Embedded systems | Summer of Science   [June'24 - Jul'24]

- Studied RISC and CISC ISA, **Computer architecture**, assembly language programming and embedded C programming
- Studied **OS concepts** including scheduler algorithms, interprocess communication, semaphore, mutexes and Threads

TECHNICAL SKILLS

- **Programming Languages**   C++, Python, HTML, CSS, JavaScript, Verilog HDL, VHDL, SQL, Embedded C
- **Frameworks & Libraries**   React.js, Django | Pytorch, Tensorflow, Sci-kit learn, Pandas, NLTK, OpenCV
- **Softwares**   Quartus Prime, KiCAD, MATLAB, Simulink LTspice, Keil, AutoCAD, VS Code

KEY COURSES UNDERTAKEN

- **CS & AI and DS courses**   Data Structures and Algorithms*, Data Science, Machine Learning, C and C++
- **Maths courses**   Optimization, Probability and Random Processes, Calculus, Differential equations
- **Electrical Engineering**   Processor design*, Signal Processing, Electronic Devices, Communication Systems
- **Lab Courses**   Electronic devices lab, Microprocessors lab, Digital Circuits Lab, Communication lab

(* to be completed by Apr'25)

EXTRACURRICULAR ACTIVITIES

Social	• Participated in the **Versova Beach Cleanup**, promoting environmental activities • Volunteered for **International Yoga Day event**, supporting wellness activities
Sports	• Engaged in **NSO Yoga** during my first year, acquired the techniques of yoga • Achieved a **Bronze medal** in **District level Karate championship** at Jaipur
Technical	• Completed a **Microsoft Office course**, accredited by **Rajasthan RSCIT** program • Participated in **IOT (Internet of Things)** Tech General Championship in IIT Bombay