



Ayush Milind Patil
Electrical Engineering
Indian Institute of Technology Bombay

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B.Tech.
Gender: Male
DOB: 6/6/2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	
Intermediate	HSC	Pace Junior Science College	2020	93.85%
Matriculation	SSC	Dr. N.P. Shah School	2018	95.40%

Pursuing a **Minor Degree** in **AI and Data Science** at the Centre for Machine Intelligence and Data Science

SCHOLASTIC ACHIEVEMENTS

- Secured an All India Rank of **548** in **JEE Advanced** out of over **0.2 million** candidates across India (2020)
- Achieved a percentile of **99.87** in **JEE Main** out of over **1.2 million** candidates across India (2020)
- Recipient of the Kishore Vaigyanik Protsahan Yojana (**KVPY**) Fellowship, having secured **AIR 369** (2020)
- Among the **top 35** students in Mumbai selected for Indian National Mathematics Olympiad (**INMO**) (2019)
- Received **High Distinction** award in Mathematics in the **IAIS** exam conducted by **UNSW**(Australia) (2018)

PROFESSIONAL EXPERIENCE

TATA 1MG Technologies Pvt. Ltd. | Summer Intern

(Jun '22 - Present)

Data Analysis & Marketing for Sales Optimization

- Analyzed **inside sales** data of **0.5M** orders to project a **100% YoY** growth by preparing annual operating plan
- Mapped sources of lead generation to identify underutilized channels to yield a **125%** increase in their orders
- Conceptualized a process by onboarding **1000+** pharmacies to generate **INR 13 lakhs** of monthly revenue
- Received an **LoR** from the **Associate Vice President** for providing detailed data-driven insights in diagnostics

KEY PROJECTS

Learning in Navigation Neural Networks

(Jul '22 - Present)

Guide: Prof. Udayan Ganguly | Summer Undergraduate Research Project 2022

- Implementing a **spiking** neuromorphic hardware-compatible navigation algorithm in **NengoLoihi** emulator
- Achieving optimal foraging time by using **klinokinesis**, **klinotaxis**, and **orthotaxis** to the feedforward network
- Utilizing neural networks to achieve the desired deviation by implementing **contour tracking** principles

Mini Motorways Solver

(May '22 - Present)

Seasons of Code 2022 | Web and Coding Club, IIT Bombay

- Built an **AI-based solver** with the help of **graph theory** to optimize results in a traffic simulation software
- Applied data structures in order to implement path-finding algorithms such as **BFS**, **DFS**, and **Dijkstra's**
- Implemented Graph Neural Networks (**GNN**) using **TensorFlow Keras** to achieve road-network optimization

Machine Learning

(May '22 - Jul '22)

Summer of Science 2022 | Maths and Physics Club, IIT Bombay

- Completed a detailed **61-hour** ML course on Coursera taken by **Dr. Andrew Ng** of **Stanford University**
- Studied the pipelines and steps in evaluating the models utilizing core ML algorithms such as **K-Means**, **Neural Networks**, **Support vector machines**, **Recommender systems**, and **Anomaly detection systems**
- Trained a neural network to recognize digits from **MNIST** database with a training set accuracy of **97.52%**

Face Detection & Image Clustering Model

(Apr '22 - May '22)

Guide: Prof. Biplab Banerjee | Course Project | DS 303

- Deployed **Multi-task CNNs** to detect faces and create an encoding vector from images for their features
- Performed feature measurement & extraction to compare faces by using the **Google Facenet** system
- Utilized **Deep Learning** for face encoding and serialized them into clusters using the **DBSCAN** algorithm

RISC Microprocessor Design

(Apr '22 - May '22)

Guide: Prof. Virendra Singh | Course Project | EE 309

- Designed an **8-register**, **16-bit** microprocessor to execute **17 instructions** using the **RISC** architecture
- Developed the **flowcharts** and **datapath** structures for single-cycle and multi-cycle models from scratch
- Simulated the designed microprocessor model by implementing a **finite state machine** on Quartus software

Number Theory

(May '21 - Jul '21)

Summer of Science 2021 | Maths and Physics Club, IIT Bombay

- Utilized concepts of **modular arithmetic**, **GCD-LCM**, and **diophantine equations** to solve complex problems
- Compiled a detailed **video presentation** to explain key principles and real-life applications of divisibility

LABORATORY EXPERIENCE

Microprocessor Simulation on Keil

(Jan '22 - Apr '22)

Guide: Prof. Saravanan Vijayakumaran | EE 337

- Constructed a **temperature monitoring** device with an LCD module using **Atmel AT89C51** micro-controller
- Coded the micro-controller in the **Embedded C** programming language using **Keil μ Vision** and **Flip** software
- Used **UART** module and **RealTerm** software for interfacing between a keyboard and the micro-controller

Analog Circuits Simulation on Ngspice

(Jan '22 - Apr '22)

Guide: Prof. Anil Kottantharayil | EE 230

- Conducted tests on **Load cells** and other bridge-type sensors such as **diaphragm-type pressure sensor** circuits
- Used **Ngspice** to simulate circuits and used instruments such as oscilloscopes & multimeters to test them

Power Engineering

(Jan '22 - Apr '22)

Guide: Prof. Baylon Fernandes | EE 240

- Gained insights on the working of **Synchronous**, **Asynchronous**, and **Induction** machines through labs
- Observed the functioning of **DC Motor** and **Transformer** in power systems and performed their experiments

Digital Logic Design in VHDL

(Jul '21 - Nov '21)

Guide: Prof. Maryam Baghini | EE 214

- Performed **RTL** and **Gate-Level Simulation** in VHDL and implemented on **Krypton** board using **ScanChain**
- Adopted **behavioral modeling** to design string recognizer, sequence generator, ALU, and universal shifter

TECHNICAL SKILLS

Programming Languages

Python, MATLAB, C++, VHDL, Assembly, L^AT_EX, HTML, Octave

Libraries & Frameworks

NumPy, Pandas, Matplotlib, TensorFlow, Keras, PyTorch, SciPy

Software Tools

Quartus, Keil, Atmel Flip, Ngspice, Jupyter, Git, Premiere Pro, MS Office

KEY COURSES UNDERTAKEN

Electrical Engineering

Analog Circuits, Digital Systems, Signal Processing, Probability & Random Processes, Power Engineering, Microprocessors, Electronic Devices & Lab*, Control Systems & Lab*, Communication Systems & Lab*, EM Waves*

Data Science

Introduction to Machine Learning

Computer Science

Computer Programming and Utilization

System & Control

Mathematical Structures for Control

Mathematics

Calculus, Linear Algebra, Complex Analysis, Differential Equations

Physics

Quantum Physics and Applications, Electricity and Magnetism

*To be completed by Nov '22

EXTRA-CURRICULAR ACTIVITIES

Content Creation	<ul style="list-style-type: none">Created satirical content on Instagram that received 30,000+ views for 16 videosProduced improv podcasts on Spotify that garnered viewership from 8 countriesCompleted Stand-Up & Video Editing Courses under Summer School of Culturals
Chess	<ul style="list-style-type: none">Among the top 5 out of 250 players at the District Sports Office chess tournamentSecured 1st place in multiple inter-school chess tournaments like Vidya-Vihar open, MGM chess open, Agashi-Virar-Arnala Edu-Society open, and Vasai Kalakrida open
Miscellaneous	<ul style="list-style-type: none">Bagged the 1st position in the IITB Freshiesta IPL Auction among 1300 studentsReceived the Best Student award in school out of 500 students for all-round excellenceConducted free webinars for JEE Aspirants with a viewership of 1000+ studentsSuccessfully completed a year-long Dramatics course by National Sports Organization