Anoushka Dey | **210010010**
Electrical Engineering | **Dual Degree (B.Tech. + M.Tech.)**
Indian Institute of Technology Bombay | **Gender: Female**
Specialization: Microelectronics and VLSI | **DOB: 24/03/2003**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	
Intermediate	HSC	Ratanbai Walbai Junior College of Science	2021	96.33%
Matriculation	ICSE	Hiranandani Foundation School, Thane	2019	97.20%

Pursuing a **Minor** degree in **Computer Science and Engineering**

Scholastic Achievements

- Awarded a **Change of Branch** to the Electrical Engineering Dual Degree Programme out of **1000+** students (2022)
- Secured **99.6** percentile in **JEE Main** and was within the **top 0.02** percentile in **JEE Advanced** (2021)
- Secured **All India Rank 466** (**SA stream**) in the **KVPY** examination conducted by **IISc Bangalore** (2020)
- Recipient of the prestigious **INSPIRE Scholarship 2021**, awarded by the Government of India (2021)
- Awarded the **Hindustan Times Scholarship Award 2015-2016** for exceptional creative writing skills (2016)
- Recipient of the **Gold Medal** in the **Homi Bhabha Young Scientist Competition 2014-2015** (2015)

Research Internship

3D Mapping for Quadruped Robot Motion Control in Simulation
(May '23 - Jul '23)

TU Munich | Guide: Hongpeng Cao, Daniele Bernardini and Prof. Marco Caccamo

- Reviewed literature for **quadruped robot motion planning, 3D environment sensing** and **perception**
- Set up a **locomotion scenario** for a quadruped robot in **PyBullet** and implemented a **perception pipeline** to get **RGB-D frames** for **3D environment understanding**
- Generated **3D point clouds** using **Open3D** and used the **Iterative Closest Point (ICP) algorithm** for the **point cloud registration procedure** and **3D environment reconstruction**

Key Projects Undertaken

CPU Design and Implementation
(Nov '22 - May '23)

Digital Systems and Microprocessors | Course Project | Guide: Prof. Virendra Singh

- Designed an **8 register, 16-bit computer system with point-point communicating infrastructure** using the instruction set architecture provided
- Initial architecture was built using **FSM** and the final using **RISC** architecture as part of two course projects
- Implemented the **datapath** using components like the **Instruction Decoder, Register File, Instruction and Data memory, ALUs and sign-extenders** and devised the **control flow**
- Designed a **6 stage pipeline architecture using 5 pipeline registers** and implemented **data forwarding, stalling** and successfully completed the **hardware implementation** on the **Xen-10 board**

Keyboard, Stop Watch and SPI Implementation
(Jan '23 - Apr '23)

Microprocessors Lab | Course Project | Guide: Prof. Saravanan Vijayakumaran

- Implemented a keyboard using the **PT-51 microcontroller** using **embedded C** code written on **Keil μVision5**, performed **pin-mapping** and configured the **LCD display**
- Designed a stop watch using **timers and interrupts** and used **ATMEL FLIP** to configure the microcontroller
- Implemented an **SPI interface using USB-UART and Realterm software**

Arithmetic Logical Unit and Sequence Generator Modelling
(Jul '22 - Oct '22)

Digital Circuits Lab | Course Project |Guide: Prof. Maryam Shojaei Baghini

- Designed the ALU and the sequence generator along with multiplexers and programmed the design using **behavioural modelling** and **structural dataflow**
- Used **VHDL** on **Quartus Prime** to encode the designs and perform **RTL simulation** on **ModelSim Altera** and the **UrJTAG** terminal to perform scan chain on the **Xenon-10 Board**

Analog Circuit Design *(Jan '23 - Apr '23)*

Analog Lab | Course Project | Guide: Prof. Anil Kottantharayil

- Designed various types of **integrators, differentiators and filters** using the **TL084 IC** and **INA128 IC**
- **Plotted and analyzed the readings** and used **Ngspice for basic circuit simulations**

Exploratory Data Analysis *(Apr '22 - Jul '22)*

Data Analysis and Interpretation | Course Project | Guide: Prof. Amuthan Ramabathiran

- Used python libraries such as **matplotlib, pandas, seaborn, scipy and numpy** to **analyse the data** from the Billboard charts and **predict trends using scatter and regression plots**

Natural Language Processing *(May '23 - present)*

Summer of Science | Maths and Physics Club, IIT Bombay

- Underwent a 7 week course on **Natural Language Processing** and submitted a detailed **mid-term report** on the various **text pre-processing** techniques and the **Word2Vec** implementation using the **nltk** library
- Completed a project on **spam identification** and also perfomed **exploratory data analysis** on the dataset

Sudoku Solver *(Dec '22-Jan '23)*

Winter in Data Science | Analytics Club, IIT Bombay

- Performed puzzle extraction using **OpenCV** and used **contour detection** and **thresholding** for detecting the sudoku grid and for splitting up the puzzle
- Used **Tensorflow** to train a **neural network** on the **MNIST** database for implementing a **digit detection system** also worked on the **backtracking algorithm** for solving the puzzle

Positions Of Responsibility

Undergraduate Teaching Assistant | *Department of Computer Science and Engineering* *(Mar '23 - Jun '23)*

- Worked as a TA for **40+ UG first year students** for the course **CS101 - Computer Programming and Utilization** under **Prof. Mythili Vutukuru**
- **Conducted labs** and resolved **technical and conceptual doubts** of the students and also helped in the **smooth conduction of examinations** and **corrections**

Head Girl of Hiranandani Foundation School, Thane *(Jan '18 - Jan '19)*

- Selected by a distinguished panel of senior teachers and the school principal to **lead the Student Council Body** for the academic year 2018-2019 **based on academic merit and extracurricular achievements**

Technical Skills

Software	LaTeX, SolidWorks, ANSYS Spaceclaim, Quartus Prime, Keil μVision5, ATMEL FLIP, Realterm, Ngspice, Gazebo Ignition, Git
Programming	C++, Python, Java
Embedded	VHDL, Embedded C, 8051 Assembly
Operating Systems	Linux, Windows
Libraries	NumPy, Matplotlib, SciPy, Pandas, Seaborn, Tensorflow, OpenCV, PyBullet, Open3D

Courses Undertaken

Electrical Engineering	EM Waves*, Controls Lab*, Devices Lab*, Communication Systems*, Communications Lab*, Control Systems, Microprocessors,Analog Circuits, Electronic Devices, Digital Systems, Markov Chains and Queueing Systems, Signal Processing I, Power Engineering I and II, Probability and Random Processes, Microprocessors Lab, Analog Lab
Computer Science	Data Structures and Algorithms, Logic for Computer Science, Computer Programming and Utilization
Miscellaneous	Data Analysis and Interpretation, Linear Algebra, Complex Analysis, Quantum Physics
MOOCs	Neural Networks and Deep Learning, Supervised Machine Learning

** to be completed by Autumn '23*

Extracurricular Activities

- Worked on the **design and implementation** of the **Recovery Subsystem** of the **IIT Bombay Rocket Team**
- Completed the **LaTeX** and **Financial Markets bootcamp** under **Learners' Space** organized by **UGAC**
- Completed a year long programme in **Chess** under the **National Sports Organization, IIT Bombay**
- **Committee member** of the **Interact Club**, elected by a panel of teachers based on academic merit