

## SCHOLASTIC ACHIEVEMENTS

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- Achieved an **All India Rank** of **1619** in the **JEE Advanced** among **0.16 million** candidates (2022)
- Secured **99.90** percentile among **1.03 million** candidates in **JEE Main** conducted by the NTA (2022)
- Secured **99.94** percentile among **0.46 million** aspirants in the State-Level **MHT-CET Exam** (2022)
- Awarded **cash prize** for achieving **National Rank 5** in Millennium National Scholarship Exam (2019)
- Bagged the **19th rank** at the **state level** in **International Talent Hunt Olympiad (ITHO)** (2019)

## KEY PROJECTS

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### Cache Replacement Policy: A Comparative Analysis | Prof. Virendra Singh (May'24-Present)

- Studied and analysed the performance of various cache replacement policies like **LRU**, **MRU**, **NMRU**, **PLRU**, **RRIP**, **SHiP**, **Hawkeye**, **Harmony**, **IbRDP**, and **Mockingjay** for Chip Multiprocessors
- Used **ChampSim simulator** to model, evaluate and comparatively study the cache replacement policies
- Evaluated replacement policies using **SPEC CPU 2006**, **SPEC CPU 2017** and **GAP** benchmark suites

### 6-Stage Pipelined Processor | Course Project | Prof. Virendra Singh (Apr'24-May'24)

*Designed a **16-bit** processor system with 8 registers, implementing a **14-instruction RISC-based ISA***

- Developed and optimized pipeline stages for **arithmetic**, **logical**, **load/store**, and **branching** instructions
- Integrated **VHDL** components with **hazard mitigation** methods to ensure efficient cycles per instruction
- Simulated and tested the functioning of the RISC machine using **ModelSim** with the help of a test bench

### IITB-CPU: A 16-bit Computing System | Course Project | Prof. Virendra Singh (Nov'23-Dec'23)

- Implemented a **16-bit multi-cycle processor**, IITB-CPU using the provided instruction set on **VHDL**
- Executed diverse operations: **Arithmetic and Logical**, **Store**, **Load**, **Jump**, and **Branch on Equality**
- Developed comprehensive test benches to simulate and test the functioning of the CPU using **ModelSim**

### Analog Circuits Design | Course Project | Prof. Anil Kottantharayil (Jan'24-Apr'24)

- Designed and implemented various op-amp-based circuits on hardware and simulated using **LTSpice**
- Simulated MOSFET circuits in LTSpice, and conducted **hardware testing** to validate the simulation
- Implemented an **Electrocardiogram (ECG) amplifier** circuit by including an **instrumentation amplifier**, **right leg drive**, and **filter section** and conducted extensive testing, calibration, and optimization

### Head Motion Steered Wheelchair | Institute Technical Summer Projects (Apr'23-Sep'23)

*Designed a hands-free wheelchair system which can enhance mobility of 2.5 to 5 million people (WHO)*

- Programmed an **Arduino-based** circuit, integrated with an **IMU Sensor** and **high-torque motors**
- Designed a mechanical system with a **60 kg load capacity** for efficient operation on a **24V** power supply
- Awarded the **5th position** among **100+** teams and showcased our project at the '**Tech RnD Expo**'

### Microcontroller Interfacing | Course Project | Prof. Nikhil Karamchandani (Jan'24-Apr'24)

- Learnt **Assembly** language and **Embedded C** coding on the **ARM Keil** and **RealTerm** softwares
- Interfaced **keypad** with **PT-51** to show typed characters on LED screen, created code for musical notes
- Implemented a **low-pass filter** on PT-51 after designing in **Python**, setup **UART**, and executed in C

- Developed a bot using **IR sensors** for precise line detection, an **L298N** motor driver, and **Arduino Uno**
- Introduced an efficient **obstacle-picking mechanism** with a **servo motor-driven grabber-arm**
- Selected by the Electrical and Mechanical Engineering Departments in the **top 24 bots** for showcasing

**Hostellicious** | Course Project | Prof. P Sunthar

(Jan'24 - Apr'24)

- Developed an efficient **Feedback Mechanism** to address **Mess-Food complaints** among IITB students
- Applied efficiently the **five stages** of design thinking: **Empathize, Define, Ideate, Prototype, Test**
- Created a **Figma** prototype showcasing the key features and user interface of the Hostellicious application

**TECHNICAL SKILLS**

<b>Languages</b>	Python, C, Embedded C, C++, VHDL, HTML
<b>Softwares</b>	Quartus, Keil, AutoCAD, Adobe Photoshop, Canva, Figma, ChampSim

**KEY COURSES UNDERTAKEN**

<b>Electrical</b>	Microprocessors, Digital Systems, Analog Circuits, Signal Processing - I, Probability and Random Processes, Electronic Devices and Circuits, Analog Laboratory, Control Systems, Nanoelectronics, Communication Systems*
<b>Laboratories</b>	Digital Lab, Analog Lab, Microprocessor Lab, Power Engineering Lab, Control Systems Lab*, Electronic Devices Lab*, Communication Systems Lab*
<b>Others</b>	Introduction to Quantum Physics, Introduction to Classical Physics, Organic and Inorganic Chemistry, Physical Chemistry, Linear Algebra, Calculus, Computer Programming and Utilization, Economics, Introduction to Innovation and Entrepreneurship

\* To be completed by Nov'24

**POSITIONS OF RESPONSIBILITY****Department Academic Mentor | SMP | Electrical Engineering Department**

(Jun'24-Present)

*Part of a 54 mentor team selected out of 170+ applicants after rigorous SoP, Peer Review and Interview*

- Mentoring **6 Sophomores** individually and inspiring them for academic and co-curricular endeavours
- Responsible for the **outreach and publicity** of the events and programmes conducted by the D-AMP
- Contributing to the creation of a **DAMP blog** consisting of course reviews and internship experiences

**Design Secretary | Electrical Engineering Students' Association | IIT Bombay**

(May'23-Mar'24)

*Part of a 10-member council, selected through a process of SOPs, interviews, assignments, and peer reviews*

- Collaborated to create **20+ event posts** and the **first freshie newsletter** for the EE Department
- Organised '**CommuniCrazy**' a GNU-Radio workshop in '**Impulse**', the Electrical Department Fest
- Served as an organizing committee member for the **DTE workshop** during **G20 Youth Summit**

**EXTRACURRICULARS****National Cadet Corps | 2 MER**

(2022-Present)

- Currently pursuing '**C**' certificate in NCC under the **Ministry of Defence**, Government of India
- Undergone rigorous training in an intense **10-day Combined Annual Training Camp** (CATC411)
- Promoted to the rank of "**Lance Corporal**" for dedication to the NCC, out of a group of 200+ cadets

**Sports**

(2022-Present)

- Bagged the '**Most Valuable Player**' Trophy in Girls' Kabaddi Championship in '**Aavhan**', IIT Bombay
- Earned a **Silver Medal** representing IIT Bombay's Girls' Kabaddi Team at "**Udghosh**", IIT Kanpur
- Achieved **1st place** in the **Senior Women's Category**, at the **District Powerlifting Competition**

**Miscellaneous**

(2018-Present)

- Mentoring a group of 4 students for **ITSP 2024** conducted by the Institute Technical Council, IIT Bombay
- Secured **B grade** in **Intermediate** and **Elementary** Drawing Exams by the Govt. of Maharashtra
- Showcased numerous artworks in **Kaladarshan** ('24 and '23) organised by the Institute Cultural Council
- Participated in the Inter-Hostel **Improv General Championship** (2023), representing Hostel 15
- Presenter in a 5-day long workshop for **Women in Science and Engineering** mentoring **80+** students