Pursuing **Honors** in **Electrical Engineering** and **Minor** in **Computer Science and Engineering**

## Scholastic Achievements

- Secured **All India Rank 434** among **1.1 million** candidates in JEE Mains *[2020]*
- Achieved **All India Rank 580** among **0.16 million** candidates in JEE Advanced *[2020]*
- Awarded certificate of merit for being placed in **top 1.5%** among **49000+** candidates in NSEC *[2019]*
- Recipient of **KVPY** and awarded fellowship by IISc, Bangalore with **AIR 609** in SA Stream *[2018]*

## Technical Projects

**Design Engineer | Smart Laundry** *[May '22 - Present]*
*InstiX | Institute Technical Council, IIT Bombay*

- Working on the **hardware design** of **IoT devices** for centralizing the laundry system of hostels
- Programmed **ESP-32 NODEMCU** to connect to mobile app using **Bluetooth Serial** Communication
- Upgrading the circuit by integrating it with **ACS712 Current Sensor** to get better performance

**Electrical Engineer | SPART IIT Bombay** *[Jun '22 - Present]*
*SPART is a technical team consisting of 40 members representing India in World Solar Airship Race, 2023*

- Working towards building **solar-powered airship** to fly across South Atlantic covering **6000+km** in autonomous flight using **Hydrogen** as lifting gas to promote **sustainable air transport** in the world
- Implementing **power electronic converters** for optimization of power and battery capacity
- Formulating the design of the **propulsion system** along with its integration with **Solar modules**

**IITB-RISC-22 | Multi-cycle Processor** *[Apr '22]*
*Course Project | Prof. Virendra Singh*

- Designed an efficient **16-bit processor** which has **64 KB RAM** and **8 general purpose registers**
- Implemented a **Finite State Machine** comprising of **20 states** to perform **17** different operations
- Synthesized and assembled Memory unit, Datapath and controller in **Quartus Prime** using **VHDL**

**ATM Simulator** *[Mar '22]*
*Course Project | Prof. Saravanan Vijaykumaran*

- Simulated the working of an ATM machine on the **Atmel AT89C51** microcontroller using **Keil**
- Programmed the board using **embedded C** combined with **assembly language** and **Flip Software**
- Used **UART Module** and **RealTerm** software for **interfacing** between keyboard and micro-controller

**Logarithmic Amplifier** *[March '22]*
*Course Project | Prof. Anil Kottantharayil*

- Studied and implemented a log amplifier which can be used for direct conversion of **analog values to decibels** and performed **theoretical calculations** to find approximate values of the parameters
- Simulated the circuit using **NGspice** to fine tune the design and obtain **precise values** of parameters
- Assembled the circuit using a **TL084 opamp**, diodes and resistor values as obtained from simulation

**Fingerprint Security Lock** *[Nov '21]*
*Tinkerer's Lab | IIT Bombay*

- Brainstormed on a security system to be guarded by fingerprints using an **AS608** fingerprint sensor
- Implemented this model using an **Arduino UNO** Breakout board along with a **Relay Module**

**Spanning Tree Protocol** *[Oct '21]*
*Course Project | Prof. Varsha Apte*

- Simulated the spanning tree protocol for **networking** to work on a given LAN and bridge topology
- Programmed the network using python which takes bridges as input and returns the **connections**

**Sequence Generator** *[Sep '21]*
*Course Project | Prof. Maryam Shojaei Baghini*

- Proposed a circuit to generate a particular sequence of binary numbers using given **clock signal**
- Applied the design using both **Structural Modelling** and **Behavioral Modelling** in VHDL
- Evaluated hardware working of the model on **Krypton board** using **URJTAG** and **Scan Chain**

**Computer Vision** *[May '21 - Jul '21]*
*Summer of Science | Math and Physics Club, IIT Bombay*

- Employed **OpenCV**, **Pytorch**, **NumPy** and **Seaborn** libraries for building computer vision systems
- Performed edge detection, contour detection, shape detection pertaining to **object detection** tasks
- Scrutinized **Gradient descent**, **Adam optimizer** as building blocks of deep learning algorithms
- Explored **Neural Networks** and application of Convolutional NN in Multi-class image classification

**Lasso Game** *[Feb '21]*
*Course Project | Prof. Bhaskaran Raman*

- Upgraded a basic game of lasso of looping things to a more interactive one using **C++ graphics**
- Introduced **3+ levels** in the game with each level being more interactive and challenging
- Limited number of **continuous failed trials** and introduced an algorithm to fetch **negative points**

## Positions of Responsibility

**Interview Coordinator | Institute Placement Team** *[Nov '21 - Dec '21]*

- Assisted in conducting tests for **10+ firms** during placement season and handling student queries
- Coordinated with the placement team for conducting interviews of **1800+ students** for the year 2022

## Technical Skills

- **Languages** : C, C++, Python, LaTeX, VHDL, HTML, Assembly, Octave
- **Python Libraries** : NumPy, Pandas, OpenCV, Pytorch, Scipy
- **Software** : MATLAB, Quartus, ModelSim, AutoCAD, Solidworks, Keil, Realterm, EAGLE

## Key Courses

- **Electrical Engineering** Analog Circuits, Digital Systems, Signal Processing, Probability and Random Processes, Microprocessors, Electronic Devices, Control Systems, Power Engineering, Electromagnetic Waves*, Communication Systems*
- **Computer Science** Computer Networks, DSA, Design and Analysis of Algorithms*

** to be completed by Nov 2022*

## Extracurricular Activities

- Successfully completed one year of rigourous training under **National Cadets Corps** at IIT Bombay
- Developed a **line follower bot** to follow white path in black background using **HW201** IR sensors and **L293D** Motor Driver in the event conducted by **Electronics and Robotics Club, IIT Bombay**
- Volunteered in the **plantation drive** organised by Green Campus, NSS IIT Bombay