

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 532** in **JEE Advanced** among **150,000** candidates (2015)
- Secured **99.93 percentile** in **JEE Mains (B.E)** among **1.5 million** candidates (2015)
- Received scholarship for **NTSE** conducted by **NCERT** awarded to **Top 1000 among 5 million** candidates (2013)
- Received scholarship for **MTSE** with **State Rank 20 among** around **100,000** participants (2013)
- Secured **Rank 104** in the **Merit List** of the **All India Open Mathematics Scholarship Examination** (2012)
- Pursuing a **Minor Degree** in **Computer Science and Engineering**

INTERNSHIPS AND MAJOR PROJECTS

- **Spiking Neural Networks for adaptive navigation and control** (May'19-Present)
Guide: Prof. Udayan Ganguly Dual Degree Project
 - Building an end-to-end **Spiking Neural Network (SNN)** to model the brain of an autonomous agent equipped with *C. elegans* inspired chemotactic sensors for navigation in a chemical concentration space
 - Using **Reinforcement Learning** and **Temporal Predictive Coding** to learn the synaptic weights via a novel biologically plausible alternative to back-propagation
 - Working on instantiating a closed action-perception loop, conforming to the framework of **Active Inference**
 - Analysed **experimental chemotaxis** data to propose improvements to the navigation strategy including navigation in 3D, risk averse turning and optimal gradient based foraging
- **Lung Sound Classification** (May'18-July'18)
Samsung Research Institute, Noida Internship
 - Received a **Pre-placement Offer** on the basis of work during the Internship period
 - Worked on developing a cheap and easily deployable solution for **Machine Learning driven** automation of the **diagnosis of lung disorders**, alleviating the tedium and cost of a routine consultation with the doctor
 - Preprocessed the ICBHI 2017 dataset using the **Wavelet Transform** to obtain a sparse representation
 - Trained and tested **Decision Trees** on the dataset, and also evaluated the efficacy of **LSTMs** for the task
- **Prototypical Networks for Few-shot Learning** (Jan'18-May'18)
Guide: Prof. Amit Sethi Supervised Research Expedition
 - Studied and then implemented a feed-forward **Convolutional Neural Network** on **Pytorch**
 - Learnt about data efficient **Few Shot Learning** and then implemented **Prototypical Networks** for the same
 - Trained the model with **Adam optimised SGD** on **miniImageNet** dataset
- **Smart-shoes for Physiotherapy Diagnostics** (Jan'18-May'18)
Guide: Prof. Sidhharth Tallur Electronic Devices Lab Project
 - Conceptualized & developed a **Low power, Wireless Plantar pressure map plotting shoe sole** useful in diagnosis of physio-therapeutic disorders like flatfoot, costing Rs 5,000 with existing pressure mats costing Rs 120,000
 - Characterized, calibrated and interfaced the sensor grid, designed signal conditioning circuit and **designed PCB**
 - Implemented **Real-Time pressure mapping** on remote host device using Bluetooth communication
- **GUI and Android App Development to generate desired noise** (May'17-Aug'17)
Guide : Prof. Kumar Appaiah Project
 - Developed a **GUI** on **Qt Software** along with an **Android App** that enabled user to shape the **Noise Spectrum** by controlling the amplitudes of the different frequency ranges
 - The GUI had the features of preset buttons for special noises like **Pink & White noise** which help in concentration, sharpen memory and mind relaxation and used **FFT** to calculate the **DFT**
- **Reliance Infrastructure Limited** (Dec'16-Jan'17)
Dahanu Thermal Power Plant Internship
 - Learnt the process of Power Generation in a thermal power plant and analyzed the working of a **PLC (Programmable Logic Controller)** which controls remotely located processes from the local Control room
 - Studied the **SCADA system** which overlooks the operation of various PLCs from centralized control room
 - Also studied the **automation** of power plant process through **Distributed Control System(DCS)**

ACADEMIC PROJECTS

- **Image Colorization using CNN** (Jan'18-May'18)
Guide: Prof. Amit Sethi Course: Image Processing
 - Implemented a **Convolutional Neural Network** which would **colourize** input **black and white image** which can thus be used to replace the strenuous human intervention for the process of colourizing gray images
 - Made an **Image Editor** which could perform **Image Restoration** techniques and other traditional processes
- **Optical Flow and Dynamic Vision Sensors** (Jan'18-May'18)
Guide: Prof. Subhasis Chaudhari Course: Computer Vision
 - Implemented an energy based **Laplacian optical flow model** for motion capture applications
 - Critically analysed and evaluated the utility of **event based Dynamic Vision Sensors** for power efficient and real time sensing application for human recognition
- **Markov Chain Monte Carlo Simulation** (Jan'18-May'18)
Guide: Prof. Prasanna Chaporkar Course: Markov Chains and Queuing Systems
 - Characterised the asymptotic attractor set for **Markov Chains and Queuing systems**
 - Studied convergence criteria for Markov Chain Monte Carlo simulation schemes
 - Implemented thermodynamics inspired **Simulated Annealing** to solve the NP Hard problem TSP
- **Study of Combinatorial Auctions** (Jan'18-May'18)
Guide: Prof. Ashutosh Mahajan Integer Programming
 - Studied **Set Packing Problem**, its occurrences in real life scenarios and simulated a **Gibbs Sampler for the Boltzmann machine** as a stochastic approximation algorithm to get approximate solutions of NP Hard Problem
 - The NP Hard problems included **Combinatorial Auction** and **Traveling Salesman Problem**
- **DPLL Algorithm Implementation for solving CNF-SAT Problem** (Jan'18-May'18)
Guide: Prof. Virendra Singh Course: EDL
 - Studied and implemented DPLL algorithm which is a complete, backtracking-based search algorithm for deciding the satisfiability of propositional logic formulae in conjunctive normal form
- **Guitar Playing Bot** (May'16-Jun'16)
Robotics Club, IITB ITSP (Institute Technical Summer Project)
 - Made an **autonomous bot** which could **play songs on guitar** when fed by a computer through **Arduino**

TECHNICAL SKILLS

- **Programming languages** – C, C++, Java, Python, VHDL, MATLAB, Ladder Diagram, Function Block
- **Software packages** – ngSpice, Git, AutoCAD, SolidWorks, Quartus, ModelSim, Android Studio, \LaTeX

POSITIONS OF RESPONSIBILITIES

- **Institute Student Mentor Programme (ISMP)** | Mentor (Apr'19-Present)
 - Selected on the basis of SOP, peer reviews and interviews in the team of **108 mentors** selected from **300 applicants**
 - Mentoring **12 first year students** by helping them with their academics and extra curricular activities
- **Administration Nominee** | Hostel 2, IIT Bombay (May'19-Present)
 - 1
 - 2
- **Teaching Assistant** | Course: Image Processing (July'19-Present)
 - 1
 - 2
- **Sports Secretary** | Hostel 2, IIT Bombay (Jul'16-Apr'17)
 - Received **Special Mention** and **won** the overall **Hostel General Championship in Sports** after a gap of 12 years
 - Successfully completed initiative of conducting **H2CL(Hostel 2 Champions League)**
- **Coordinator** | Informals, Mood Indigo IIT Bombay | Asia's Largest College Cultural Festival (Sep'15-Dec'16)
 - **Conceptualized** competitions **Led** a team of around **25+ Organizers** for organizing the events and competitions
- **Coordinator** | Competitions, Techfest IIT Bombay | Asia's largest science and technology festival (Nov'15-Dec'16)
 - **Executed a competition** with more than **60 teams participating** with **each team** of 4

EXTRA CURRICULAR ACTIVITIES

Sports

- Selected among the 10 people for the **Inter IIT Badminton Camp** to represent IIT Bombay (2016)
- Secured **2nd place** in the **Hostel General Championship of Badminton** in 2016 and **3rd place** in 2017 (2016-17)
- Participated and represented my Hostel in Cricket, Football and Tug of War GCs (2017-18)
- **Mentored 30+ people** for a 4 week long Summer camp of **Badminton** at IIT Bombay (2016)
- Secured **2nd rank** in **District level Badminton Championship** (2011)
- Played and attended **Swimming, Football and Squash Camps**

Social | Technical | Cultural

- Secured **A grade** in **Intermediate Art Exam** conducted by **Government of Maharashtra** (2011)
- Designed a remote controlled **Quadcopter** and stood **5th in Remote Controlled Plane** making Competition (2016)
- Involved in '**Rethink Pink: Breast Cancer Awareness**' social campaign of Mood Indigo (2016)