Navnit Kumar | **16D070053**
Electrical Engineering | **Dual Degree (B.Tech. + M.Tech.)**
Indian Institute of Technology, Bombay | **Gender: Male**
Specialization: Microelectronics and VLSI | **DOB: 18-12-1998**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	[redacted]

Scholastic Achievements

- Nationwide **top** in **JEE Main** among 1.5 million candidates with **AIR** [2016]
- Secured **AIR** in **IIT JEE Advanced** and top in open category (among 0.2 million) [2016]
- Qualified for **interview stage** of the Kishore Vaigyanik Protsahan Yojana (**KVPY**) (among 50 thousand) [2015]
- Recipient of prestigious **Scholar Badge** given to **high-performing** class 12 students of **DPS Bokaro** (among 600) [2015]
- Achieved **International Rank 634** in the 16th National Science Olympiad, 2013 conducted by **SOF** [2013]

Professional & Research Experience

Ubisoft | *Automation Intern, Quality Control Team* *(May-July'19)*

- Researched on **Deep Learning** algorithms: R-CNN, faster R-CNN and Mask R-CNN, to **detect clipping bugs** in images
- **Implemented** Mask R-CNN based model for **detection** and **segmentation**, achieved **77% accuracy** for the task
- Reduced false positives by using **data augmentation**, test time augmentation **(TTA)** and improved model performance

Hopfield Network for Optimization Problems *(Autumn'19)*

Supervised Research Project | ***Guide:*** *Prof. Udayan Ganguly*

- **Understanding** the capability of Hopfield networks to find **optimal** solution to the **traveling salesman** problem (TSP)
- **Investigated** the mapping of graph to **network** of sinusoidal oscillators and performed cicuit simulations
- Explored the **phasor arithmetic method** for phase evolution to ensure energy **function minimization**

Key Academic Projects

Movie Recommendation System *Self Project — Spring'20*

- Explored candidate generation methods: **content-based** and **collaborative filtering** to build a movie recommender system
- **Represented** items and queries as **embeddings**, built a regularised **Matrix Factorization** model and trained it using SGD
- Implemented a **softmax** model and inspected its learned embeddings by looking at **nearest neighbours** and **norms**

Employee Attrition Analysis and Prediction | *Introduction to Machine Learning* *Course Project — Spring'20*

- Built a **machine learning** pipeline to predict employee attrition on the basis of their performance and other demographics
- **Analysed data**, employed supervised classification algorithms viz. **Random Forest**, **SVM** and achieved **87%** test accuracy

Latency and Scheduling using Graph Algorithms | *Foundations of VLSI CAD* *Course Project — Autumn'18*

- Used **Topological Sort** algorithm to find optimal ordering of circuit elements in a combinational multi-level **Boolean network**
- Implemented **resource scheduling** with time constraints and estimated latency using the **longest path** algorithm in a DAG

Deep Learning and Convolutional Neural Networks *Self Project — Spring'18*

- Built a car detection system using **YOLO v2 object detection** algorithm to locate car and generate bounding boxes around it
- Used Score-thresholding and Non-max suppression methods to select the **best bounding box** and achieved **76%** accuracy

Intelligent Power Board | *Electronic Design Laboratory* *Course Project — Spring'19*

- Developed a **power board prototype** capable of logging voltage, current and power consumption of an appliance on a remote computer over bluetooth, to **monitor power surges** (achieved **1V** resolution over **150-250V**, **10mA** resolution above **30mA**)

Technical Skills

Computer Programming	C, C++, Python, VHDL
Software Tools	Git, NumPy, Pandas, Matplotlib, TensorFlow, LaTeX, MATLAB, ngSPICE
Relevant Courses	Machine Learning, Data Analysis, Probability, Signal Processing, Linear Algebra, Calculus

Positions of Responsibility

Teaching Assistant | *Introduction to Electrical and Electronic Circuits* (Ongoing)

- **Assisted** in setting assignments, organising tutorials and evaluating answer sheets for a batch of **28** students

Coordinator, Team Pronites | *Mood Indigo 2017* (May-Dec'17)

- Lead a **team** of **20+** to execute India's largest student organized concerts attended by a crowd of **20,000**
- **Ideated** and revamped the structure for **Livewire**, India's largest and oldest semi-professional band event.

Extra-Curriculars

- Volunteered for **Green Campus, IIT Bombay** under the National Service Scheme (**NSS**), IIT Bombay *[2016]*
- Conducted **Bio-Diversity Mapping** along Main Gate Road in association with **NSS**, IIT Bombay *[2016]*
- Participated in **RC Plane** and **Line Follower Bot** Competition organised by the **STAB**, IIT Bombay *[2017]*
- Attended and successfully completed **Communication Workshop** by **Indian Training Co.** *[2020]*
- Contributed to **Open source** projects and successfully completed the **Hacktoberfest challenge** *[2019]*

Scholastic achievements and extracurricular activities are not verified by the Placement Cell