Rohan Bansal
Electrical Engineering
Indian Institute of Technology, Bombay

170070058
B.Tech.
Gender: Male
DOB: 03-09-1998

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	null
Intermediate	CBSE	DAV Public School	2016	93.00%
Matriculation	CBSE	DAV Public School	2014	10

Pursuing **minor** in **Computer Science and Engineering**

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 122** in JEE (Advanced) among 1,70,000 candidates [2017]
- Secured **All India Rank 155** in JEE (Main) among 1.4 million candidates [2017]
- Qualified for the **International Collegiate Programming Contest (ICPC)** Regionals [2018]
- Among **Top 1%** at state level in National Examination in Physics (**NSEP)** [2016]
- Selected for the Kishore Vaigyanik Protsahan Yojana **(KVPY)** interview [2016]

PROFESSIONAL EXPERIENCE

HONEYWELL FORGE | DATA SCIENCE INTERN [June'20-July'20]

- Undertook the conversion of Product Classification to an international standard aimed at increasing efficiencies across functions such as **procurement**
  - Leveraged text processing and similarity techniques like **tokenization** and **Jaccard Similarity** to classify products into **UNSPSC** Global Taxonomy consisting of over **65,000** categories
  - Successfully classified Products up to UNSPSC **Class level** hierarchy achieving accuracy of **86%** and assigned **Confidence Scores** to top-3 mappings down to UNSPSC **Commodity level**
- Worked on the issue of **Field Mapping** aimed at reducing the cost and time of **Data Migration**
  - Used **Fuzzywuzzy** string similarity to appropriately map source to target objects
  - Experimented with **Decision Tree** model and **Cosine Similarity** algorithm to improve the performance

KEY TECHNICAL PROJECTS

DEEP ANCHORED CONVOLUTIONAL NEURAL NETWORKS [May'19 - July'19]

Guide**:** *Prof. Biplab Banerjee, CSRE, IIT Bombay*

- Implemented an **18-layer** Convolutional Neural Network using **Keras** and **Tensorflow**
- Used tools like **weight sharing, residual learning, batch normalization** and **regulators** to improve the efficiency of the network, achieving an accuracy of **91.66%** on the **LFW dataset**
- Trained a Feed Forward Neural Network using the concepts of **Eigenfaces** and **Principal Component Analysis** to compare it with the deep anchored architecture

BRAIN COMPUTER INTERFACE [January'20 - March'20]

Guide**:** *Prof. Debraj Chakraborty, Electrical Engg., IIT Bombay* | *Electronic Design Lab* | *Course Project*

- Implemented an Analog Front End consisting of **low pass, high pass**, and **notch filters** and **instrumentation amplifier** to extract EEG signals of few micro volts in frequency range of **3-50Hz**
- Designed a **communication interface** between **Arduino** and laptop to collect and store EEG data using **pyserial** library and worked on Neural Network for a **binary classifier** to learn from EEG data

IMAGE COMPRESSION [January'19 - April'19]

Guide**:** *Prof. Biplab Banerjee, CSRE, IIT Bombay* | *Machine Learning in Remote Sensing* | *Course Project*

- Implemented **k-means Clustering** algorithm in **Python** on the **Dogs vs Cats** Dataset
- Achieved **image compression** with **70%** decrease in size while still retrieving most of the attributes
- Trained a **Convolutional Neural Network** using **Keras** to implement **Image Classification** and compare the classifying accuracy of the compressed and original image

EIGEN FACES vs FISHER FACES [August'19 - November'19]

Guide**:** *Prof. Suyash Awate, CSE, IIT Bombay* | *Fundamentals of Digital Image Processing* | *Course Project*

- Implemented and compared two popular face recognition algorithms, **Fisher faces** and **Eigen faces** on the **Yale Face Dataset** which has sufficient variations in lighting and facial expressions
- Provided a **mathematical basis** to explain the difference in the performance of algorithms

IITB-PROC, A MULTI-CYCLE RISC PROCESSOR DESIGN [August'19 - November'19]

Guide**:** *Prof. Virendra Singh, Electrical Engg., IIT Bombay* | *Microprocessors* | *Course Project*

- Designed a **16**-**Bit, 6-Stage Pipelined RISC** processor with **8 registers** based on Turing-Complete **ISA**
- Optimized performance of the processor through **data & control hazard mitigation, result forwarding**
- Implemented the code in **VHDL** using **Altera Quartus IDE** and successfully tested on **Cyclone IV FPGA Board**

HEART RATE MONITOR [September'18]

Guide**:** *Prof. Siddharth Tallur, Electrical Engg., IIT Bombay* | *Electronic Devices Lab* | *Course Project*

- Implemented a **Heart Rate Monitor** circuit functionally similar to the one used in Apple Watch
- Studied and applied the concept of **PPG (Photoplethysmogram)** used in medical devices
- Designed a circuit consisting of an **Infrared LED** and a **phototransistor pair** to detect the PPG signal
- Examined the waveform on Digital Storage Oscilloscope using **bandpass filter** and **inverting amplifier**

DC MOTOR SPEED CONTROL [January'18 - April'18]

Guide : *Prof. Mahesh B. Patil, Electrical Engg., IIT Bombay* | *Introduction to Electronics* | *Course Project*

- Implemented an **8-speed** DC motor speed control circuit from logic gates, op-amps and transistors
- Applied concepts like **pulse width modulation** and **astable multivibrator** to control the speed

VELOMOBILE [December'18 – July'19]

Guide : *Prof. Arindrajit Chowdhury, Mechanical Engg., IIT Bombay*

- Part of a team that aims to construct a hybrid vehicle powered by human and electric power
- Responsible for handling the **systems and controls** of the vehicle and **synchronizing** the motions offered by both human and electric power
- Used **MATLAB** to work on feedback control system of DC motor to control the **gear ratio**

TECHNICAL SKILLS

- **Softwares :** MATLAB, LaTeX, Quartus Altera, GNU Plot, AutoCAD, NGSpice, Arduino
- **Languages :** C/C++, Python, Java, VHDL, HTML
- **Machine Learning :** Tensorflow, Keras, PyTorch, NumPy, Pandas, Scikit-learn

KEY COURSES

ELECTRICAL ENGINEERING	COMPUTER SCIENCE	MATH & STATISTICS
Digital Signal Processing, Network Theory, Digital Communications, Power Systems, Microprocessors, Analog Circuits, Digital Systems	Data Structures & Algorithms, Digital Image Processing, Advanced Topics in Machine Learning*, Speech and Natural Language Processing and the Web*	Markov Chains and Queuing Systems, Advanced Probability and Random Processes for Engineers*, Data Analysis and Interpretation

**to be completed by November'20*

EXTRA-CURRICULARS

ORGANIZER | TECHFEST | IIT BOMBAY [2017]

- Organized Techfest World MUN with a team of **20** members, witnessing the participation of over **500** delegates from **15** different countries
- Ensured smooth working by assisting the delegates and judges during the event

SPORTS

- Completed one year of **Lawn Tennis** Training under **National Sports Organization** [2017]
- Represented hostel in Lawn Tennis and Crossy **General Championships** [2018]

OTHERS

- Received an **Appreciation award** by **Punjab National Bank** on clearing JEE(Advanced) [2017]
- School winner in **Spot the Einstein Challenge** conducted by Vidyamandir Classes [2011]
- Stood **2nd** in the **Science quiz** conducted by DAV Centenary Public School, Phillaur [2014]