Ashutosh Rabia

Pre-Final Year Undergraduate
Department of Mathematics and Statistics, IIT Kanpur

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2022 - Present	B.S (Mathematics and Scientific Computing)	Indian Institute of Technology Kanpur	**7.2**/10
2022	CBSE(XII)	Vinayak International School, Sikar	93%
2020	CBSE(X)	Vinayak International School, Sikar	92%

Scholastic Achievements

- Achieved **All India Rank 3040** in **JEE Advanced 2022** among **160k shortlisted candidates** , conducted by IIT Bombay
- Achieved **All India Rank 2543** in **JEE Mains 2022** among more than **1 million candidates**, conducted by NTA
- Awarded **A*** grade for exceptional performance in Introduction to Electronics course in 2023-24 II semester

Internship Experience

ML driven P300 classification for Enhanced BCI Intent Recognition (*May'24- Jul'24*)

SURGE-IITK: Mentor: *Prof. Tushar Sandhan , Dept. of Electrical Engineering*

Objective	-To enhance the classification of **P300 speller**, an intent-based **Brain Computer Interface** (BCI) paradigm, using various advanced Machine Learning models to achieve higher classification accuracy.
Approach	-Utilized **MNE** and **torcheeg** libraries to visualize P300 data with topomaps and ERP plots, and detect artifacts. -Developed and implemented a baseline **Random Forest** model and **StackNet** incorporating various classifiers, such as **LDA**, **SVM**, and **XGBoost**, to significantly enhance predictive performance and accuracy. -Utilized **EEGNet**, **LMDA-Net**, and LMDA-Net with an extra layer of **Temporal Attention** for enhanced P300 signal classification, conducting a comprehensive comparative analysis of the models' performance. -Selected **LMDA-Net** as a baseline model and integrated temporal attention to reduce average **Inference Time**.
Results	-Attained **AUC** score of **0.73** with Random Forest, **0.76** with StackNet, and **0.79** with EEGNet for P300 speller data. -LMDA-Net surpasses other representative methods in classification accuracy, achieving the highest AUC score of **0.81**.

Key Projects

Fraudbuster | *SnT* | *IIT Kanpur* (*May'23- Jul'23*)

- Objective was to analyze and predict fraudulent credit card transactions in kaggle **credit-card** dataset.
- Applied **EDA** to clean the data-set, replaced outliers with median and Scaled the data points using StandardScaler.
- Trained pre existing Models such as **decision tree, Random Forest, XGB** classifier and achieved **F-1 score(0.95)**.

Build your own CV Library | *Stamatics* | *IIT Kanpur* (*Apr'23- Jul'23*)

- Built an extensive library in C implementing popular image processing techniques such as **Gaussian blurring, Sobel edge detection, Canny edge detection** and **Harris corner detection** along with **multiple color-space conversions.**
- Implemented various image interpolation techniques, elementary transformations, **convolutional filters,** hybrid images.

Stock Prediction using Deep Learning | *Self Project* (*May'24- Jul'24*)

- Developed a deep learning model with **TensorFlow** and **LSTM** networks to properly predict future stock price fluctuations.
- Applied data preprocessing and scaled the data points to improve the performance and robustness of the model.
- In-depth analysis of stock prices for prominent tech firms including **Google**, **Amazon**, **Microsoft**, and **Apple**. Developed predictive models to accurately forecast stock prices of over 20 months, achieving a **root mean squared error** of less than **5.2**.

Future Sales Prediction | *Self Project* (*Jan'24- Mar'24*)

- Performed data preprocessing on daily sales data of **1C Company** and transformed the dataset into a time series problem.
- Developed predictive models including **Multilayer Perceptron** (MLP), **CNN, LSTM**(Long Short Term Memory) , and **CNN-LSTM** to forecast future sales, achieving a minimum root mean squared error of **18.5** with the **MLP** model.

Technical Skills

- **Programming Languages:** C, C++, SQL, HTML, CSS, LaTeX, Python, MATLAB
- **Softwares and Libraries:** Git, Github , Numpy, Pandas, Matplotlib, Scikit learn , Scipy, Jupyter, Tensorflow, MNE

Positions of Responsibility

Secretary | PR | Antaragni (*Sep'23- Oct'23*)

- Successfully invited renowned personalities, artists and worked with organizers for seamless cultural events.
- Provided constant on-ground support, enhancing overall artist experience and acted as the primary contact for artists.
- Led a team of freshmen for maintaining comprehensive artist databases ,managed travel and accommodation logistics for artists.

Relevant Courses

A* : Exceptional Performance

Fundamentals of Computing	Introduction to Probability	Linear algebra
Introduction to Electronics(A*)	Data Structure and Algorithm	Complex Analysis
Quantum Physics	Non Linear Regression	Set theory and Logic
Numerical Analysis and Scientific Computing	Embedded and Cyber-Physical Systems	Ordinary Differential Equation

Extra-Curricular Activities

- **Factapp ,India** - Mentored and counselled 200+ students, enabling informed decisions for their academic and career paths.
- Part of the Kabbadi Team(Runner up) in Inferno '23 and the Cricket Team in ICC '24(Runner up) ,inter-hall sports competitions.