# MAYANK AGRAWAL | 19EE38011

## ELECT.ENGG. SIGNAL PROCESSING AND MACHINE LEARNING(M.Tech Dual 5Y)

## EDUCATION

| Year | Degree/Exam | Institute | CGPA/Marks |
|---|---|---|---|
| 2024 | M.TECH Dual Degree 5Y | IIT Kharagpur | 8.20 / 10 |
| 2019 | Higher Secondary School Certificate, MPBSE | A.M.I. Shishu Mandir, Gwalior, Madhya Pradesh | 90.60% |
| 2017 | High School Certificate, MPBSE | A.M.I. Shishu Mandir, Gwalior, Madhya Pradesh | 94.33% |

## INTERNSHIPS

### Engineering Intern | Svastir Technologies Pvt. Ltd. [May 2023 - July 2023]

Objective: *"To Explore AI Frameworks for Implementing Edge Computing on Mobile Devices"*
- Researched on mobile-based edge computing AI frameworks (**TensorFlow**, **PyTorch**, **HuggingFace**) for diverse cross-domain applications
- Contributed to existing framework and algorithm enhancements through code reviews, resulting in improved efficiency of models by **12%**
- Aided a cross-functional team to provide insights, hardware device data preparation & **10+** model evaluations in various product verticals

### Data Science Intern | ITILITE Technologies Pvt. Ltd. [Nov 2021 - Jan 2022]

Objective: *"To Conduct Research for Developing Client-Generated Customisable Reports Dashboard"*
- Consolidated travel & expense reports of client employees with vendor reports using **Python**, leading to a **92%** reduction in discrepancies
- Strategized the ETL process, data visualisation, and UI design of dashboard using Alteryx, **D3.js**, talend, while assessing PowerBI & **Tableau**
- Streamlined report generation with Tableau, reducing the processing time to **4-5 hrs** from earlier **2-3 days** of manual work on redash.io

### Machine Learning Intern | Indian School of Business [July 2021 - Oct 2021]

Objective: *"Applying Machine Learning Techniques to Predict Household Livelihoods in India"*
- Analysed dataset of **5000+** households across **7** rainfed villages in different states and generated the dependent & independent variables
- Performed data pre-processing (cleaning, normalisation) and feature selection via **chi-square** test, **pearson** coeff, and L1/L2 regularisation
- Conducted clustering with CART, **hierarchical clustering**, & K-means; evaluated models using silhouette score (achieved top **0.68**) and ARI

## PROJECTS

### Stock Price Prediction | Self Project [April 2022 - May 2022]

- Extracted the closing price of top IT companies listed on NSE using Yahoo Finance and checked their stationarity using **ADF & KPSS tests**
- Generated **Stationary Data** by removing trends, seasonality & irregularities and further analyse **ACF and PACF** plots
- Applied **ARIMA, ANN, LSTM models** and obtained best results with ARIMA model with RSME of **12.63** and MAPE of **2.37%**

### End-to-End Extractive and Abstractive Text Summary Generator | Self Project [Oct 2022 - Dec 2022]

- Trained encoder-decoder models with **LSTMs**, **Bi-LSTMs**, **Bi-GRUs** and **Attention** mechanisms to generate text summaries of input data
- Implemented **TextRank** & **LSA** (Latent Semantic Analysis) to generate extractive text summaries with customised information retrieval
- Deployed the developed models using **Gradio**, where the web interface accepts data input in multiple formats and returns a summary

## COMPETITION/CONFERENCE

### Alphaverse Premier League, IIT Kharagpur | Alphagrep Securities [July 2023]

- Achieved **7**[th] place out of **200+** IITKGP competitors by submitting over **50** unique alpha strategies, demonstrating strong quantitative skills
- Strategize alphas using statistical functions by formulating the diverse financial indicators, e.g., price, volume, profit, options, volatility, etc

### HackRx 4.0 | Bajaj Finserv | Finalist | Competed against 4.3k+ registered teams [July 2023]

- Part of 5-member finalist team, devised a personalised stock recommendation tool using collaborative filtering based on user-specific data
- Mapped out sentiment analysis on the picked stocks & ranked them using market sentiment news for precise and latest recommendations

## AWARDS AND ACHIEVEMENTS

- Secured **Gold medal** in Open IIT Product Design 2022, IIT Kharagpur for designing a product to prevent children from falling into borewells
- Achieved an All India Rank of **2214** in the Joint Entrance Examination **(JEE) Advanced 2019** among the 1.61 lakh candidates who took the exam

## COURSEWORK INFORMATION

**Computer Science:** Design & Analysis of Algorithms | Operating Systems | Database Management System | Object-Oriented System Design
**Machine Learning:** Artificial Intelligence | Machine Learning | Deep Learning | Data Analytics | Speech Processing | NLP | Image Processing
**Mathematics:** Linear Algebra | Probability & Stochastic Processes | Transform Calculus | Convex Optimization | Differential Equations

## SKILLS AND EXPERTISE

**Programming Languages:** C | C++ | Python | SQL          **Utilities/Softwares:** Tableau | MS Office (Excel, Word, PowerPoint) | MATLAB
**Frameworks and Libraries:** NumPy | pandas | Matplotlib | Scikit Learn | PyTorch | TensorFlow | OpenCV

## POSITIONS OF RESPONSIBILITY

### Associate Manager, Operations | Inter IIT Tech Meet 10.0 [Nov 2021 - April 2022]

- Led a team of **12** peers to organise **14** tech events, coordinating with **10** organisations and over **1000** participants from **22 IIT** contingents
- Mediated between companies and teams, to ensure seamless tech meet & conducted **2 events** completely from designing PS to execution

## EXTRA CURRICULAR ACTIVITIES

**Tech:** Participated in Data Analytics & Case Study competition in General Championship 2022 on behalf of Meghnad Saha Hall of Residence
**Sports:** Captain of Bridge team and member of Basketball team of Meghnad Saha Hall of Residence in the General Championship 2023
**Social Service:** Associated with GYWS, a student-led NGO dedicated to educating underprivileged children, actively from Aug'19 to Mar'22
**Welfare:** Mentored 10 Electrical Engineering fresher students under the purview of Dean of Students Affairs, IIT Kharagpur, for year 2022-23