

SARWESH P

IIT Kharagpur, West Bengal, India

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Education

Indian Institute of Technology Kharagpur

2020 – 2025

B.tech+M.tech(dual degree 5Y) in Elect.&Elec.Com.Engg CGPA: 8.14/10

Kharagpur, West Bengal, IN

Narayana Junior College

2020

Grade 12 (TSBIE), Percentage: 95.5%

Hyderabad, Telangana, IN

Kids Club School

2018

Grade 10 (CBSE), Percentage: 96%

Tirupur, Tamil Nadu, IN

Publications

Causality between Sentiment and Cryptocurrency Prices

Jun'22-Nov'22

Supervisor: Prof. Abhijeet Chandra

IIT Kharagpur, IN

- Obtained 10+ million English-only tweets from Twitter API and utilised a variety of NLP methods to clean the tweets and eliminate any irrelevant “noise” and used strategies such as TF-IDF to remove stopwords
- Topic modelling to get the various narratives was performed through Gibbs Sampling Dirichlet Mixture Model (GSDMM) clustering algorithm on the cleaned tweets, which is based on Latent Dirichlet Allocation (LDA)
- Applied Transformer neural network model BERTweet to get the sentiment scores of the tweets
- Constructed sentiment time series for various crypto narratives, analyzed causal links with Bitcoin price fluctuations

Internships

Data Scientist Intern | Snowflake

May'24-July'24

LLM Guard and Document Diversity

Pune, IN

- Developed an innovative LLM Guard utilizing gradient analysis of safety-critical parameters in language models, achieving a remarkable 98% accuracy in identifying and blocking Irrelevant queries sent to a RAG system
- Implemented locality-sensitive hashing techniques to efficiently identify and classify similar documents, resulting in a 20-fold increase in processing speed compared to traditional methods
- Led the development and implementation of two pivotal projects, LLM Guard and Document Diversity, utilizing advanced AI techniques to enhance model safety and accelerate document similarity analysis

Mitacs Globalink Research Intern | University of Quebec Montreal

May'23-July'23

Demand Estimation for Facility Location with Decision-dependent Demand

Supervisor: Prof. Sanjay Jena Dominik

- Employed GRU and LSTM deep neural networks to estimate demand for facility location by leveraging historical customer demand data, facilitating more accurate predictions
- Devised different Dynamic Programming and Greedy approaches to determine the order of locations to visit in order to maximise profit
- Increased Demand captured from location predictions by 15% from prior solution, improving profit margins and operational efficiency

Data Science Research Intern | Indian School of Business Hyderabad

Dec'22-Feb'23

Stock forecasting using ARIMA with ML

Supervisor: Prof. Anand Vijayasankaran

- Developed a hybrid model consisting of ARIMA and Machine Learning for stock price prediction of NSE NIFTY stocks
- Forecasted the Stock prices using time series model ARIMA and also obtained the residuals from the forecast
- Trained the residuals with Machine Learning (SVM, Random Forest) and Deep Learning (LSTM) Models and added both residual forecast and stock price forecast to get the final prediction

Projects

Multimodal KGP Chat Bot

Dec'24 - Present

Self Project

- Developing an AI-driven chatbot with both audio and text interfaces to enable seamless interaction and cater to diverse user preferences
- Implementing a Multi-Agent Framework with specialized agents to handle tasks like querying a question paper, retrieving academic calendar details, and managing context-specific requests efficiently
- Employing Graph Retrieval-Augmented Generation (RAG) to extract relevant information from internal college resources and web-based datasets for accurate and contextual responses

Context-Aware Profile Query System Using RAG

Jun'24

Self Project

- Designed and implemented a Agentic RAG system to organize and query professional profile data, integrating CV and project documents into modular vector stores for efficient retrieval
- Developed an intelligent query resolution agent that dynamically identifies relevant knowledge sources (e.g., CV, projects, academic records) and redirects queries to appropriate vector databases
- Improved response accuracy and contextual relevance over traditional RAG systems by leveraging dynamic query-routing, ensuring precise and efficient retrieval from relevant knowledge bases

Portfolio Optimization using Deep Learning | Term Project

Aug'22-Nov'22

Supervisor: Prof.Geetanjali Panda

IIT Kharagpur, IN

- Utilized Deep learning and Quadratic programming to optimise the stock portfolio to maximise anticipated return and reduce risk
- Used LSTM,GRU neural network models to forecast stock price in order to pick the top 10 stocks for the portfolio
- The weighting of the equities in the portfolio was determined using the Markowitz model based on quadratic programming

Technical Skills

Programming languages: Python, R, STATA, SQL, C++, MATLAB

Python packages: Pandas, Numpy, Langchain, Scikit-learn, Tensorflow, NLTK, Keras, PyTorch, Streamlit

Professional softwares: Excel, PowerPoint, Word ,Bloomberg Terminal

Relevant Coursework

Mathematics: Probability and Statistics,Linear Algebra and Optimisation Models, Linear Algebra, Calculus, Operation Research

Data Science/Programming: Machine Learning & Applications, Deep Learning, Natural Language Processing, Programming and Data Structures, Algorithms

Finance: CFA L1 2024 Cleared, Bloomberg market concepts,Optimization methods in Finace, Network Analysis in Finance and Economics

Electronics: Network Theory, Analog Electronic Circuit, Signal and Systems, Digital Electronic circuits, Digital Signal Processing, Communications, Control System Engineering

Position of Responsibility

Core Organizing Team Member

Aug'21 - Mar'22

Kshitij, Annual Techno Management fest

IIT Kharagpur, IN

- Responsible for handling Publicity, Corporate and Alumni relations with branding
- Managed a team of 30 Campus Ambassadors from different colleges across India under my mentorship
- Conducted fest time event India Innovates for the very first time in Kshitij
- Publicized and conducted Kascade (a pan-Indian prelude event) in Tamil Nadu with over 1300 attendees resulting in 75% on year growth

Secretary Technology

Jan'22 - Apr'22

Homi Jehangir Bhabha Hall of Residence

IIT Kharagpur, IN

- Elected to Hall Council Members to serve as Secretary Technology, HJB Hall of Residence for the academic session 2021-22
- Supervised the Hall team throughout Technological Competitions (data analytics, case study), and held regular meetings
- Cultivated interest in Tech among the hall boarders by conducting Technological Workshops in fields like SDE, Analytics, Case Studies

Awards and Achievements

- Won first place in Quantathon (algo-trading) competition of 36'Wall Street 2024 organised by IIT Madras
- Achieved top 10% performance among canditates in clearing CFA Level 1, 2024 examination
- Passed with distinction in PET(Preliminary English test) and KET(Key English Test) Exams conducted by University of Cambridge
- Secured district 3rd and school 1st in 10th board exams
- Ranked among the top 0.6% and 1.7% in JEE Main 2020 and JEE Advanced 2020 respectively
- Bagged gold medal in 9th SOF International Science Olympiad and International Math Olympiad in the year 2016

Extra Curricular Activities

- Represented HJB Hallin Inter-Hall Cricket and Tennis tournament; Won Bronze in Tennis General Championship 2023
- Member of the Data Analytics and Case Study team of HJB hall; Team Leader in Open IIT Data Analytics 2023
- Organised events for IIT Kharagpur Tamil Sangam's Pongal '23 which had a footfall of over 500+ campus residents