



| Qualifications | University | Institute | Year |
|---------------------------|---|------------|---------|
| M.Tech Specialization: | IIT Bombay Optimization and Data Science | IIT Bombay | 2023-25 |

PROFESSIONAL EXPERIENCE

Cognitio Analytics LLC | Data Science Intern (May'24-Jul'24)

- Reviewed over **10 research papers** on Generative AI and documented their use case into the medical domain
- Preprocessed medical database containing **58,000** hospital admissions, **38,000+** adult patients and their diagnosis
- Developed **LSTM** and **Transformers** based models to predict patient next visit embedding from medical history
- Classified diseases into **5 classes**, achieved **19%** higher **AUROC** with **LightGBM** over end-to-end NN models

ACADEMIC WORK AND PROJECTS

A.I. for Advance Data Analysis and Simulation | Master's Thesis Project (May'24-Present)
 Guide: Prof. Jayendran Venkateswaran

Objective: To develop a system that analyzes simulation data & generate meaningful insights using **Generative A.I.**

- Implemented **Data Farming techniques**, integrating the **explainable AI (XAI)** to analyze large simulation data
- Performed **1M+ simulations** & clustered the output data using **K-Means, DBSCAN & Hierarchical** algorithms
- Extracted insights & improved model transparency with explainability in **Neural Networks** and **Random Forest**
- Future work:** Integration of the **LLM** technologies such as **Microsoft's InsightPilot** and **JarviX** into the system

Differentially Private Recommendation System | Course Project | Machine Learning (Jan'24-April'24)
 Guide: Prof. Balamurugan Palaniappan

- Applied **3 privacy-enhancing** algorithms by injecting **Laplace noise** at the input, processing & output stages
- Developed **Matrix Factorization** algorithms from scratch, including **Alternating Least Squares(ALS)** & **SGD**
- Achieved **95%** accurate prediction while balancing the trade-off between **privacy parameter** & model **RMSE**

LLM for Automated Commonsense Knowledge Graph Construction | Seminar (Jan'24-April'24)
 Guide: Prof. N. Hemachandra

- Implemented **COMET** by **fine-tuning GPT-1** to generate and enhance the commonsense knowledge inferences
- Leveraged the **ConceptNet** and **ATOMIC** knowledge graphs with over **40M** and **877K** commonsense concepts
- Achieved **perplexity** of **11.14** & **BLEU-2** score of **15.10**, reflecting quality & novelty in commonsense generation

Airline Ticket Sales Prediction using Time Series Forecasting | Self Project (Jan'24-April'24)

- Analyzed the given data to check for **stationarity** & decomposed it to get **level, trend, seasonality, and residue**
- Performed **ADF test** for stationarity & used **ARIMA, SARIMA, Prophet** and **XGBoost** to predict future sales
- Achieved **14.27% MAPE** using Facebook's Prophet model, surpassing SARIMA's **19.23%** in forecasting accuracy

Retrieval Augmented Generation(RAG) Based Chatbot | Course Project | Deep Learning for NLP (Jan'24-May'24)
 Guide: Prof. Pushpak Bhattacharya

- Developed an **AI-powered chatbot** using **Retrieval-Augmented Generation (RAG)** to minimize hallucinations
- Integrated the **OpenAI's GPT-3.5** for language modeling via LangChain for better conversational capabilities
- Managed a **30-book** vector space for domain-specific knowledge integration and built a UI using Streamlit

Risk Analysis, Modelling and Product Design for Insurance Optimization | Course Project (Aug'24-Nov'24)
 Topics in IEOR | Guide: Prof. Narayan Rangaraj

- Analyzed the claim amount data for different types of insurance using box plots, scatter plots, and histograms
- Identified the underlying distribution of claim amounts using the Kolmogorov-Smirnov and Chi-squared tests
- Analyzed the **VaR** and **TVaR** for both datasets and found that personal claims are more risky than other claims
- Proposed products like **No-Claim Bonus Incentives** and **Tiered Premium Pricing** for different user segments

KEY COURSES & TECHNICAL SKILLS

- Machine Learning:** Principles and Techniques
- Mathematical Optimization** Techniques
- Languages:** Python, C++, Java, SQL, Kotlin,
- Softwares & Tools:** Hugging Face, Power BI, Matlab, OR Tools, OpenCV, Android Studio, Azure ML, Gurobi
- Deep Learning** for NLP
- Engineering Statistics**
- Libraries:** Scikit-Learn, Pytorch, NLTK, Pandas, Matplotlib
- Modelling and Computation Lab**
- Simulation Modelling and Analysis**

SCHOLASTIC ACHIEVEMENTS & EXTRACURRICULARS

- Represented **IIT Bombay** on a **global level** in the **IISE Rockwell Student Simulation Competition** (2024)
- Achieved **AIR 23** in GATE 2023 and **AIR 196** in GATE 2022 Textile Engineering and Fiber Science. (2023)
- Developed an **IoT device** for hostel power conservation and secured **3rd place** in Jarvis Technical GC (2023)
- Awarded a **Bronze Medal** in the Tug of War General Championship for outstanding performance (2023-2024)
- Awarded a **Bronze Medal** in the Volleyball PG General Championship
- Achieved rank **25** in the IE 506 (Machine Learning) Kaggle competition out of **400+** submissions (2024)