

## MAMTA UDAI

+91-9782991795  
[mamtaudai98@gmail.com](mailto:mamtaudai98@gmail.com)

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## EDUCATION

- *IIT Kanpur, Bachelor of Science (BS) in Mathematics and Scientific Computing, 2023*

## EXPERIENCE

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*Freelance AI Engineer, Outlier.ai*

*Oct 2024 – Present*

### ▪ RAG Chatbot

- Developed a **RAG** based chatbot using **GPT-4o-mini LLM** over rich PDF documents to scale existing chatbot
- Devised an automated end-to-end **text chunking** and **indexing** pipeline with **pdfminer** to extract text and **GPT-4o** to analyze content from images converted from PDF pages
- Used hybrid search (**BM25 and KNN**) in Elasticsearch to retrieve relevant context for the answer generation
- Evaluated the experiments using Factual Correctness metrics (**G-Eval Correctness, Precision, Recall**) and **Answer Relevancy**, achieved an overall avg correctness of 79% (**abs 3%** better than existing chatbot)

### ▪ Math LLM Evaluation Automation

- Developed **automation** pipelines for testing of over 500 high-quality prompts for AI models, focusing on math-related queries (geometry, algebra, and statistics), achieving **95% alignment** with quality benchmarks
- Evaluated **LLM** over custom **Accuracy, Consistency and Quality** metrics in handling math-related queries
- The structured evaluation pipeline helped in improving assessment **efficiency and reliability by 20%**

## PROJECTS

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### ▪ Credit Card Fraud Detection

- Executed comprehensive data pre-processing including **Exploratory Data Analysis (EDA)**, **Feature Engineering** and **Anomaly Detection** to prepare data for training using **Pandas**
- Explored models like **Logistic Regression, Decision Tree, Random Forest** in **Scikit-learn** for training
- Used **F1-score** to measure performance of the model achieved with **best score of 82%** on test data

### ▪ NFT Sales Analytics SQL Reporting

- Extracted valuable insights by **analyzing Non-Fungible Token (NFT) sales data** using **SQL** queries to uncover trends & patterns for investors, collectors interested in NFTs
- Created **aggregated view** of the NFT Market by **grouping** NFT name and calculated avg price for each group
- Identified highest-value transactions & price trends over time; visualized price distribution using **histogram**
- Created Temporary tables to hold daily average price for each transaction and to filter out certain transactions

### ▪ Superstore Sale Performance Tableau Dashboard

- Developed comprehensive dashboards in **Tableau** showing sales performance metrics for a retail superstore
- Utilized **Calculated Fields, Parameters, and Filters** for in-depth sales analysis and reporting
- Created **Pie charts, Bubble charts, Bar charts, and Histograms** to visualize & analyze data distribution
- Conducted **correlation analysis** and visualized results using **Heatmap** to identify key patterns and insights

## LANGUAGES AND SKILLS

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- **Programming Languages:** Python, C, R, SQL, Matlab
- **Tools and frameworks:** Pandas, Keras, Tensorflow, Scikit-learn, Prompt Engineering, LLM, GenAI, Huggingface, MS-Excel, Power BI, Tableau, OpenAI, Elasticsearch

## CERTIFICATIONS

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- Machine Learning Specialization from Coursera
- Data Science Bootcamp from UpGrad
- Intro to Large Language Models (LLMs) from Udemy
- LLM Engineering: Master AI, Large Language Models and Agents from Udemy