Muskan Ara

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About Me

"I'm an aspiring Data Scientist with a strong focus on Generative AI technologies, including experience with advanced models such as Llama3.3, Groq API, and NLP techniques. I have hands-on expertise in building and deploying AI-driven solutions for real-time document processing, semantic search, and content generation. During my recent internship, I gained hands-on experience in data cleaning, analysis, and visualization. I am now eager to apply my skills in a role that focuses on using data-driven insights to solve complex problems. I'm passionate about leveraging Generative AI to solve complex problems, enhance productivity, and create impactful solutions."

Experience

Data Science Intern   *Sep–Oct 2024*
Cognifyz, Remote

– Conducted data cleaning and preprocessing to ensure the quality and reliability of datasets for analysis.

– Utilized Python for data analysis and visualization, leveraging libraries such as **pandas**, **NumPy**, and **Matplotlib**.

– Designed and developed machine learning models for predictive analysis, evaluating their performance to generate actionable insights.

– Gained expertise in handling, analyzing, and building machine learning models for real-world applications, improving decision-making processes.

Data Science Intern   *Dec 2024–Jan 2025*
Oasis Info Byte, Remote

– Leveraged advanced NLP techniques, such as lemmatization, stemming, and **word2vec**, to identify duplicate questions and improve user experience on the Quora platform.

– Implemented the **Random Forest** algorithm for classification tasks and integrated **Streamlit** to create an intuitive user interface for real-time interaction.

– Developed a machine learning-based system to identify defective semiconductor wafers, optimizing production efficiency and maintaining high-quality standards in integrated circuits.

– Applied advanced machine learning techniques to enhance defect detection accuracy in semiconductor manufacturing, improving operational efficiency.

Skills

- **Programming Languages:** Python, SQL, MongoDB

- **Data Analysis:** NumPy, pandas, Matplotlib, seaborn

- **Machine Learning:** Supervised Learning, Unsupervised Learning, Recommendation Systems, NLP techniques (lemmatization, TF-IDF, word2vec)

- **Deep Learning:** ANN, CNN, RNN, LSTM, GRU, Transformers

- **Libraries:** scikit-learn, TensorFlow, Keras, NLTK, Gensim, spacy

- **Web API Development:** Flask, Streamlit, FastApi

- **Tools & Technologies:** VS Code, Jupyter Notebook, Git, GitHub, Docker, MongoDB ,MySQL Workbench

- **Other Skills:** Model deployment, working with APIs, End-to-End project handling

Projects

- **RAG Applications with NVIDIA NeMo and Streamlit** *GitHub Link*
  - Implemented a sophisticated Retrieval Augmented Generation (RAG) system leveraging NVIDIA's AI endpoints and Streamlit for document analysis and question-answering.
  - Developed a multi-PDF document processing pipeline with advanced text chunking and FAISS vector store integration.
  - Integrated real-time performance metrics and similarity search visualization for enhanced user experience.
  - Configured the system to support NVIDIA Llama-3.1-Nemotron-70b for context-aware responses and efficient query processing.
  - Optimized document chunking, vector search, and response generation to improve processing time and accuracy.

- **Reducing Operational Costs with Cost-Sensitive XGBoost-Based Failure Prediction** *GitHub Link*
  - This project focuses on handling imbalanced sensor data for classification tasks, with techniques such as data preprocessing, model evaluation, and cost analysis.
  - The dataset contains sensor data with missing values, class imbalance, and various features requiring imputation and scaling.
  - Several machine learning models, including Random Forest, XGBoost, and CatBoost, are evaluated using metrics such as accuracy, F1-score, precision, recall, and ROC-AUC score.
  - Advanced techniques such as KNN imputation, SMOTE-TOMEK for resampling, and robust scaling are used to improve model performance and handle data irregularities.
  - The project analyzes multiple experiments, comparing models' performance and costs, with the goal of identifying the most effective solution for imbalanced datasets.

- **AI-Driven Pneumonia Diagnosis: Harnessing Custom CNNs for Chest X-Ray Analysis** *GitHub Link*
  - Developed a custom convolutional neural network (CNN) to detect pneumonia from chest X-ray images.
  - Achieved high diagnostic accuracy through rigorous training and validation processes.
  - Deployed the model in a user-friendly web application for healthcare professionals.

- **AI-Powered Voice Assistance Using Google's Gemini 1.5 Pro Model** *GitHub Link*
  - Built a voice assistant powered by Google's Gemini 1.5 Pro AI model, designed for engaging and efficient conversations.
  - Developed the application using Flask, enabling a web interface for handling voice inputs and providing real-time responses.
  - Configured the AI model via Google's Generative AI API, leveraging a customized prompt to ensure clear, concise, and contextually relevant answers.
  - Maintained conversation history using a global variable, allowing for context-aware responses and enhancing user experience.
  - Processed user queries through an API endpoint, generating dynamic responses and returning them alongside the conversation history.
  - Demonstrated effective integration of generative AI into a Flask web application, showcasing its potential for creating intelligent, user-focused conversational agents.

- **End-to-End Medical Chatbot Using Llama3.3** *GitHub Link*
  - Developed a robust medical chatbot powered by the Llama3.3 model to provide accurate and reliable healthcare information.
  - Designed to handle end-to-end interactions, including user query processing, response generation, and context management.
  - Implemented real-time query handling, context-aware conversation management, and precise medical responses leveraging Llama3.3's advanced language understanding capabilities.
  - Fine-tuned prompts to ensure professional, concise, and medically accurate answers tailored to user inquiries.
  - Incorporated a user-friendly interface, enabling seamless interaction for patients and healthcare professionals seeking quick and reliable medical information.
  - Demonstrated the potential of generative AI in healthcare, enhancing accessibility to medical knowledge while maintaining ethical and contextual considerations.

Certifications

- **Google Data Analytics** — Coursera
  October 2024
  Focused on data analysis techniques, data visualization, and cleaning.

- **Machine Learning and Deep Learning** — Udemy
  July 2024
  Covered algorithms, neural networks, and deep learning frameworks.

- **Complete GenAI Course with LangChain and HuggingFace** — Udemy
  September 2024
  Specialization in Generative AI, LangChain integration, and HuggingFace models.

Education

Master of Science in Data Science   2023 - 2025
Chandigarh University, Chandigarh, India
Key Courses: Machine Learning, Data Visualization, Big Data Analytics, Statistical Modeling
Highlights: Academic projects focused on predictive analytics and real-world data solutions.