Pranjal Rane

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Education

Northeastern University — **Boston, MA**

Master of Science (MS.) Computer Science; **GPA: 3.80/4.00** — Sep 2022 – May 2024

Related Courses: Algorithms, Artificial Intelligence, Data Mining Techniques, Cloud Computing, Database Management Systems

Vishwakarma Institute of Technology — **Pune, India**

Bachelor of Technology (BTech.) Computer Engineering; **GPA: 9.11/10.00** — Aug 2018 – Jul 2022

Work Experience

Cummins Inc. — **Columbus, IN**

Data Science - Co-Op (Generative AI) — May 2023 – Jan 2024

- Developed two Retrieval Augmented Generation (RAG) applications using Llama and GPT (3.5 & 4), resulting in a 30% improvement in predictive accuracy for HR Chat bot and Global Warranty chat bot usecase.
- Designed and managed a data pipeline that processed and cleaned over 1TB of company data, leading to a 25% reduction in data processing time, by implementing data extraction and cleaning techniques like Text Normalization and Regex pattern matching.
- Achieved a 15% increase in RAG application efficiency, by prompt engineering and conducting a detailed comparative analysis of fine-tuned Llama and GPT-4 models and selecting the best-performing model for deployment
- Streamlined model deployment and increased accessibility, by using MLflow to host the optimal RAG model and developing a callable API with Databricks ML model deployment services.
- Addressed and resolved specific use-case limitations, enhancing retriever coverage by 40%, by designing and implementing a custom document retriever that outperformed the existing solution from Hugging Face in handling complex corner cases.

Solocl Technologies — **Pune, India**

Mobile Application Developer — Jan 2021 – Jan 2022

- Enhanced user login efficiency by 15% by implementing improved cloud based authentication and user session management techniques.
- Reduced latency by 20% through URL-based deep linking and database-driven pagination, enhancing app navigation and data retrieval.
- Increased user revenue by 9% with Paytm API integration, enabling diverse payment options like cards and digital wallets.

Projects

Stock Price Prediction | Machine Learning and Deep Neural Networks | *GitHub*

- Led a team of five, achieving key insights using Bollinger Bands and MACD, and determining feature importance with XGBoost.
- Implemented ARIMA and LSTM models to forecast stock prices, attaining a peak accuracy of 91% in future share price prediction.

Face Mask Detection and Face Recognition | Computer Vision, Deep Learning | *GitHub* | *Manuscript*

- Optimized ResNet101 architecture to accurately detect face masks on individuals, achieving a remarkable 99% detection accuracy.
- Implemented a Deep Metric Learning network with ResNet-34 architecture, effectively recognizing individuals' faces with high precision.

Tool for Automatic Question Generation | Natural Language Processing | *GitHub* | *Manuscript*

- Attained 87% accuracy in identifying answer phrases using a Gaussian Naive Bayes classifier on the SQuAD 1.0 dataset.
- Utilized word embeddings and cosine similarity to generate distractors for the generated questions, enhancing the tool's robustness.

Credit Worthiness of a Customer | Self-supervised Machine Learning and Multi-Label Classification Model | *GitHub*

- Performed data preprocessing and data visualization on a credit card dataset with more than 30 thousand entries
- Utilized Logistic Regression and Random Forest Classifier for credit default detection, achieving 85% accuracy in predictions.
- Boosted the classification model's accuracy to 92.22% by employing hyperparameter optimization techniques (RandomizedSearchCV).

Stock Portfolio Management | Java, MVC, SQL, Object-Oriented Programming & Design | *GitHub*

- Developed a real-time stock portfolio management application in Java, achieving robust and scalable design by implementing MVC architecture with design patterns like Factory and Singleton, adhering to SOLID principles.
- Attained 97% code coverage and minimized potential defects by rigorously writing JUnit tests for functionality testing
- Ensured efficient data caching and accessibility by fetching real-time stock data using the Alphavantage API, storing it in SQL, and employing programming constructs like stored procedures, functions, and triggers.

Skills

Programming Languages: Python (with focus on DS & ML libraries), Java, C/C++, JavaScript, C#, HTML, CSS, PHP

Frameworks & Librariess: PyTorch, TensorFlow, Keras, Sklearn, Pandas, Matplotlib, Hugging Face, GPT, Langchain, ReactJs, Node.js

Data Science: NLP, A/B testing, Statistics, Classification, Unsupervised Learning, Ensemble, IR, Time Series Analysis, Hypothesis Testing

Database Technologies: MySQL, Microsoft SQL Server, SQLite, MongoDB, Amazon DynamoDB, Databricks (Data Lakehouse)

Cloud Technologies: AWS (SageMaker, Lamda, DynamoDB, Rekognition, and more), Azure Cloud (Azure Open AI), Google Firebase

Tools & Technologies: Git, Postman, Hadoop, MapReduce, HDFS, Docker, MuleSoft, Kafka, Jenkins, Databricks, Palantir Foundry, Spark

Achievements & Extracurricular

- Awarded Best Project in Agriculture domain at the Smart India Hackathon for outstanding innovation, outperforming over 250 teams.
- Earned AWS Cloud Architect Certification, mastering AWS services like EC2, S3, RDS, DynamoDB & IAM; Specialized in designing scalable and secure cloud solutions.