Muppidi Rahul Reddy

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EDUCATION

University of Texas at Dallas *Aug '2022 – Dec '2023*
Master of Science in Computer Science GPA **3.61**
Courses: Statistical Methods for Data Science, Machine Learning, Computer Vision, Big Data Analytics, Design and Analysis of Algorithms, Web Programming Languages, Database Design.

Indian Institute of Information Technology Allahabad *Jul '2018 - May '2022*
Bachelor of Technology in Information Technology
Courses: Data Structures and Algorithms, Operating Systems, Automata Theory, Database Management, Machine Learning, Computer Networks, Data Mining, Graph Theory, Object Oriented Programming, Wireless Network Security

TECHNICAL KNOWLEDGE

Programming Languages	C/C++, Python, Java, JavaScript, R, Shell Scripting,
Databases	MySQL, PostgreSQL, MongoDB, Oracle DB
Systems Programming	Inodes, File Handling, Page Tables, Process Scheduling, Virtual Memory, Interrupt Handling
Cloud & Big Data	AWS (S3, EC2, RDS, Lamda, Textract, OpenSearch Service, SageMaker, Bedrock), Apache Spark, Hadoop, Kafka
Web Development	HTML, CSS, React, NextJS, PHP, Typescript, Flask
Machine Learning	Pandas, Numpy, Yolov5, Tensorflow, Keras, Pytorch, SciPy, Scikit-learn
Generative AI	LangChain, LMStudio, Ollama, Prompt Engineering, RAG
Other Tools & Technologies	Docker, Git, Power BI, MATLAB, Excel

PROFESSIONAL EXPERIENCE

Applab Systems, Dallas,TX *Jan '2024 – Present*
Software Development Engineer **– RAG, NLP, LangChain**

- Improved information retrieval accuracy by 70% compared to keyword search by implementing semantic search capabilities using **Amazon OpenSearch Service** with the k-NN index.
- Built a highly accurate (95%+) document OCR pipeline utilizing **Amazon Textract** for extracting text and structural data from complex engineering diagrams and schematics stored in S3.
- Optimized retrieval precision by 40% through advanced text chunking algorithms executed in **AWS Lambda** and generating vector embeddings via **OpenAI Embeddings API**.
- Integrated **GPT-4 with Vision** via API calls from AWS compute services to analyze and interpret engineering drawings, enhancing multimodal RAG capabilities and boosting usability by 60%.
- Leveraged the **GPT-4 API** from AWS services for generating accurate, context-aware answers based on technical document chunks retrieved from Amazon OpenSearch Service.

Coral Innovations Pvt. Ltd, Hyderabad,India *Dec '2021 – Jul '2022*
Machine Leaning Engineer **– Pytorch, YOLOv5, Python**

- Engineered a **Meter Board Reader application** using YOLOv5, automating meter reading with **78% accuracy**.
- Improved dataset preprocessing, enhancing pipeline efficiency by **30%** through optimized feature extraction.
- Implemented **data augmentation techniques**, increasing model robustness and generalization.
- Fine-tuned object detection models, achieving **higher accuracy with optimized hyperparameters**.

ACADEMIC PROJECTS

Mini Unix Kernel Simulation– C, Inodes, File-handling, Page tables

- Built a simplified **Unix-like kernel** supporting process creation, scheduling, and system calls (e.g., fork(), exec(), wait()).
- Implemented a **basic file system** layer with support for block-level access, inodes, and file metadata management.
- Designed an interrupt handling mechanism and incorporated basic virtual memory management with page tables and swapping.

Scalable Search Engine Using Elasticsearch– Elasticsearch, Python, Kibana

- Indexed large datasets (e.g., Wikipedia dump) and exposed a REST API for fast, ranked queries.
- Tuned shard allocation, replication, and indexing strategies to improve **query throughput and fault tolerance**.
- Integrated Kibana dashboards to visualize usage stats and search heatmaps.

Predicting Safety Probabilities by Location and Day in Dallas – Pandas, Streamlit, sklearn, Llama -2

- Created a **Streamlit dashboard** to analyze crime severity using **Random Forest classification**.
- Integrated **Llama-2 NLP model** for text-based severity analysis.

PERSONAL ACCOMPLISHMENTS

- **Demonstrated problem-solving and technical skills** through active participation in hackathons and data science competitions.
- **Managed social media engagement and event coordination** for a university dance crew, increasing audience interaction.