URVIL PANCHAL

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Work Experience

DATA SCIENNCE TRAINEE @ NEXUSLINK SERVICES PVT. LTD. Jun 2024 – Present

- Developed an end-to-end object detection system using the yolo-v8, with deployment on **RunPod** serverless.
- Built a **RAG** system leveraging large language models (LLMs) for enhanced information retrieval. Created and deployed scalable APIs using FastAPI and containerized applications with **Docker**.
- Managed cloud infrastructure and deployments on **AWS**, optimizing for performance and cost, while handling version control and code management through **GitHub** to streamline team collaboration.

Skills

Programming Languages: Python
Core Competencies: Machine Learning, Deep Learning, Computer Vision, Natural Language Processing
AI/ML Frameworks: PyTorch, TensorFlow, Langchain, Scikit-Learn
Tools & Platforms: Git, Github, Docker, Amazon Web Services (AWS)
Additional Skills: Flask, Streamlit, FastAPI, LLM Fine-tuning, Ollama, Transformers, RAG Techniques

Projects

NSFW Detection System

- Trained a **YOLOv8** object detection model to detect explicit content by identifying adult imagery. Data was manually annotated to ensure high accuracy.
- Created a **Docker** application for the detection system, enabling seamless integration and scalability.
- Hosted the system on **RunPod**, providing efficient and scalable cloud-based detection for NSFW content.

LLM-Powered Document Q&A System | Medium article

- Developed a **Retrieval-Augmented Generation (RAG)** application that accepts text and PDF files as inputs, and let users to ask questions and get responses based on the content of the files.
- Used **Llama 3.1-70B** as the Large Language Model (LLM) with **Groq API**, and **Qdrant Vector Store** for efficient data storage and document retrieval.
- Used **Langchain** as the framework to seamlessly integrate the LLM, document retrieval, and user interaction for an interactive Q&A experience.

Object Detection Using Detection Transformer

- Annotated over **8,000 doors** in floor-plan images for object detection
- Trained **Facebook's DeTr** model on custom annotated data to detect doors in floor plans.
- Developed and deployed the model in a **Docker image** for scalable use.

Fine-Tuned BERT for Sentiment Analysis

- Fine-tuned BERT for binary sentiment analysis (Positive/Negative) using the **Transformer library**.
- **Tokenized** input text and applied positional encoding to handle word order
- Used **Masked Attention** to ensure the model focused on relevant parts of the input during training.

Implemented GraphRAG

- Implemented **GraphRAG** using Langchain framework for retrieval-augmented generation.
- Integrated **Llama 3.1-70B** as the large language model with **GroqAPI** for enhanced performance.
- Utilized **Neo4j Vector Database** for efficient storage and retrieval of embeddings.

RAG Evaluation using RAGAS

- Implemented **RAGAS** (Retrieval-Augmented Generation Assessment) to **evaluate** RAG pipeline.
- Analyzed metrics like Response **Accuracy** and **Relevancy** to assess model performance.
- Also used other libraries like NLTK and rouge-score to calculate **BLEU Score** and **ROUGE Score**.

Education

B.E in Information Technology • Gujarat Technological University 2020-2024