Charuvarthan T

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Education

Amrita Vishwa Vidyapeetham Coimbatore, BTech in Artificial Intelligence Engineering 2023 – Present

- **Coursework:** Data stuctures, Design and analysis of algorithms, Machine-Learning, Computer Networks, Communication and IOT, Operating systems, Mathematics for computing

Projects

Legal Sphere - Law Information Retrieval and Image Analysis GitHub

- Developed and implemented a Retrieval-Augmented Generation (RAG) system for law information retrieval, focusing on women's safety, by processing and extracting data from legal texts. Designed a computer vision model to analyze images of women and generate descriptions related to harassment cases, subsequently passing the extracted information to a RAG model for the retrieval of relevant laws and punishments. Utilized BERT embeddings to optimize law retrieval accuracy and implemented Tesseract for OCR-based data extraction from images.
- Tools Used: Gemini-Pro, DeepSeek, BERT, Groq whisper

Implementation of all pair shortest path using Jhonson's algorithm GitHub

- Implemented Johnson's Algorithm to compute shortest paths between all pairs of vertices in a weighted, directed graph, handling negative edge weights using Bellman-Ford for cycle detection and Dijkstra's Algorithm for optimized pathfinding. Applied algorithmic techniques, analysed the algorithm and demonstrated efficient performance with large-scale datasets.
- Tools Used: C++

ADMM-Enhanced Regression for Faster Convergence GitHub

- Incorporated alternating direction method of multipliers in a regression model, to prove faster convergence and did a comparative study. Results showed ADMM was efficient.
- Tools Used: Python, Numpy, Scikit-learn, Pandas

AI-Enhanced Medical Diagnostics Application using Flask and Google Gemini GitHub

- Developed a Flask-based web application that utilizes Google Gemini AI to analyze medical form data and generate structured medical reports. The app provides personalized diagnostics, possible conditions, and recommended actions based on user inputs such as age, temperature, and medical description.
- Tools Used: Python, Flask, Gemini-API

Efficient Proxy Server for Secure Web Communication GitHub

- A lightweight proxy server built for secure and efficient web communication. Implements request forwarding, caching, and filtering mechanisms to optimize network performance while maintaining user privacy and data security.
- Tools Used: Python, Socket

Achievements

- **Secured 3rd Place in the Gen AI x Gender Technology Hackathon 2024-25** for developing a Legal Assistant mobile app powered by AI, designed to provide legal assistance and resources to users.
- **Leetcode** Solved 570+ problems **Profile**

Technologies

Languages: C++, C, Java, Python, SQL, JavaScript

RAG, Machine Learning, Fine-Tuning, Linux Architecture, Git, React.js, Node.js, MongoDB, HuggingFace, Django, PyTorch, TensorFlow, OpenCV, BERT