LangChain and LLM Use Cases

Introduction

Large Language Models (LLMs) have transformed natural language processing across various fields. Langchain, a framework, further enhances this advancement by integrating LLMs with external data sources, enabling context-aware responses and efficient prompt engineering. Langchain facilitates domain-specific tasks without requiring LLM fine-tuning, simplifying the development of AI applications. This literature review explores previous research and common use cases of Langchain in healthcare, document analysis, and information retrieval.

Mental Health Applications

The MindGuide chatbot described in the paper *Revolutionizing Mental Health Care through Langchain* demonstrates the application of LangChain in building a chatbot used for mental health support. It uses OpenAI, LLMChain, and different LangChain components like ConversationBufferMemory to enable personalized interactions with users experiencing anxiety or depression. The main objective of this research is to provide an easily accessible platform for early identification of mental health issues, and providing support.

MindGuide stores embeddings of some frequently asked mental health questions and answers in ChromaDB vector store and connects it to ChatGPT using langchain, and uses StreamLit for the user interface. This use case illustrates the growing role of AI in mental health interventions.

PDF Querying Using LangChain

Another common use case is discussed in the paper named *Constructing the ChatGPT for PDF Files with LangChain*. Here, Langchain is used to develop a system for querying PDF documents, making the process of extracting relevant information from unstructured data like PDF's more efficient. This paper talks about storing the data in a vector database, performing semantic search, and utilizing LangChain to manage document indexing and information retrieval.

This system allows users to interact with PDF files in a conversational interface, enabling them to upload documents on the platform and ask questions about their documents, or get summaries of their documents.

Works Cited

1. T. P. Jacob, B. L. S. Bizotto, and M. Sathiyanarayanan, "Constructing the ChatGPT for PDF Files with Langchain – AI," in *Proceedings of the 7th International Conference on Inventive Computation Technologies (ICICT 2024)*, IEEE, 2024, pp. 835-839. DOI: 10.1109/ICICT60155.2024.10544643(Constructing_the_ChatGP…).

2. A. Singh, A. Ehtesham, S. Mahmud, and J.-H. Kim, "Revolutionizing Mental Health Care through LangChain: A Journey with a Large Language Model," in *Proceedings of the 14th Annual Computing and Communication Workshop and Conference (CCWC 2024)*, IEEE, 2024, pp. 73-78. DOI: 10.1109/CCWC60891.2024.10427865(Revolutionizing_Mental_…).