

Shubham Pandey | Email : C00302906@setu.ie
 MSc in Data Science,
 Supervisor: Dr Lei Shi
 Department of Computing,
 South East Technological University Carlow.

Supercharging the Edtech Experience Powered by Gen AI and NLP



Find me on LinkedIn

01. Introduction

Developments such as Generative AI in the domain of artificial intelligence have shown effective understanding and answering the user queries and they are noted to perform well with several data formats. Hence, after leveraging multimodal analysis and harnessing the potential of Large Language Models (LLMs), learners can be empowered with targeted search capabilities within the Edtech ecosystem.

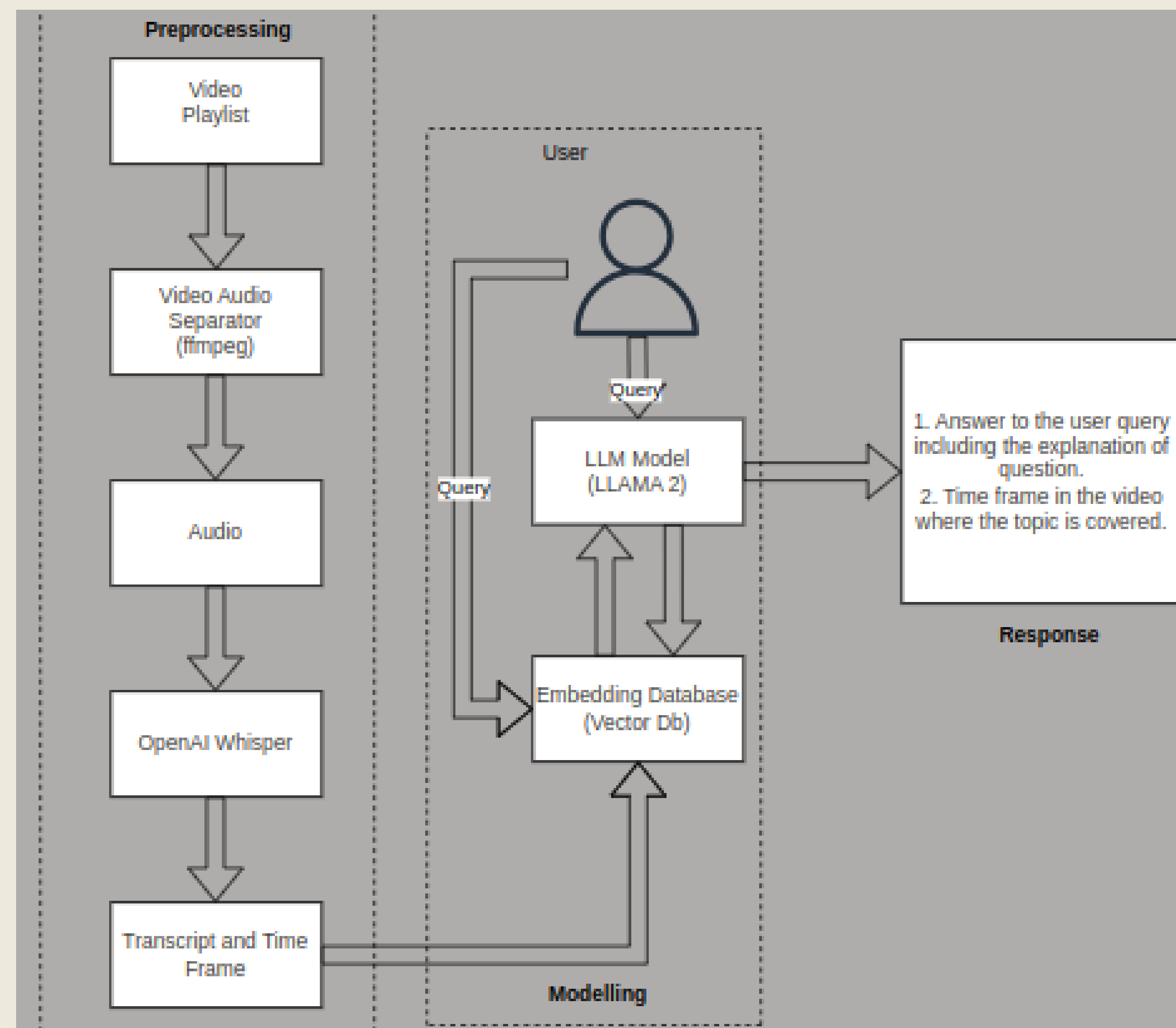
02. Research Objective

- To develop a solution employing Generative AI models and natural linguistics to identify the specific content which is wanted by the users in the educational video.
- To identify the main challenges in using the NLP and language models for assessing the user specific solution in the educational videos.
- To study the different factors that affect the proper identification of precise content with the aid of natural language and AI by the users in the educational video.

03. Literature Review

- Bahja (2020) showcases NLP and AI enhancing engagement in educational videos via natural query expressions.
- Millstein (2020) underscores AI algorithms refining content search through natural language analysis.
- This aids users in finding content aligned with their learning goals.
- Furthermore, Fiallos, Fiallos, and Figueroa (2021) suggest NLP and AI enable personalised learning by understanding users' preferences and learning styles.
- Personalised approaches promote a tailored user journey.

04. Methodology



- Extract transcripts and timeframes from the video dataset.
- Separate audio from video and feed it to OpenAI Whisper for transcript generation.
- Utilize OpenAI Whisper to provide transcripts and timeframes for the videos.
- Send the extracted transcript and timeframe to the embedding database model for conversion into mathematical vectors.
- Train the Large Language Model (LLM) on these vectors to enhance accuracy.
- Include user query context, feed it to the LLM model, and match it with data stored in the vector database.
- Return the best matches to the LLM model for conversion into natural language and answering user queries.

05. Early Indications

- The native English audio yields better results, with transcripts of higher quality.
- Proofreading Python libraries can enhance transcript quality and response accuracy.
- Various vector database models exhibit different capabilities as some offer faster results, while others provide more accurate outcomes.

06. Next Steps

- **Transcript Optimisation:** Improve quality, particularly for non-native English audio.
- **Vector Database Evaluation:** Assess various models to choose the best one.
- **Model Fine-tuning:** Enhance accuracy through transcript and vector optimisation.
- **Scale-up Testing:** Test with larger datasets for robustness and performance.
- **User Feedback Collection:** Collect feedback to refine and improve continually.

07. References

1. Bahja, M., (2020). Natural language processing applications in business. E-Business-higher education and intelligence applications.
2. Fiallos, A., Fiallos, C. and Figueroa, S., (2021), July. Tiktok and education: Discovering knowledge through learning videos. In 2021 Eighth International Conference on EDemocracy & EGovernment (ICEDEG) (pp. 172-176). IEEE.
3. Millstein, F., (2020). Natural language processing with python: natural language processing using NLTK. Frank Millstein.

Technologies

