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Mini Lecture Slide Generator Using LLM For Space Education

Final Thesis by

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Abstract

Problem-It becomes evident from the ever-rising popularity of self-learning education techniques today that there is a growing need for systems that can auto-generate lecture notes and mini-lecture slides from education resources. Many existing solutions do not have the capability to factor the user-defined specification into its learning system and incorporate the other forms of media that should accompany the lecture, for example the images which are very relevant in the case of this lecture. The Lection Ai project meets these challenges by applying LLM to access user-entered topics or materials and produce educational content. This means that it becomes an easily accessible tool to educators, students, and researchers, and they will be benefiting from it in many of their tasks as related to historical data.

Methodology- That way, Lection Ai uses OpenAI GPT for generating lecture content, as well as mini lecture slides, textual resumes of the content shown, or quizzes, together with image search API for getting the dynamic relevant visuals. The user interface was built with Flutter while the back end was built with Flask; AWS is used for cloud configurations. In the area of text processing and generation the derived LLM is exposed to the methods of repromting or prompt engineering to create mini-lectures and quizzes. Additionally, proper images are obtained and included in the output pdfs improve the completeness of the educational material. Some of the methods for conducting our research are to collect samples of educational data and develop outputs to assess the content's relevance and the message's clarity.

Initial Results-The Lection Ai prototype was tested with example educational materials, showing successful creation of content on different subjects. Preliminary quantitative findings indicate a precision score of 0.87 and recall score of 0.84, obtained through a Confusion Matrix for assessing content and imagery relevancy. An AUC-ROC assessment of user feedback rated the system's capability to meet specific requirements at 0.92, showing strong alignment with user needs for usability and performance.

Subject Descriptions:

- Computing Methodologies - > Artificial intelligence -> Natural language processing - > Language resources
- Information systems - > Information retrievals - > Retrieval model and ranking
- Applied computing - > Education - > Interactive learning environments

Keywords: Educational content generation, large language models, lecture generation, image integration, natural language processing