Abstract

Academic and medical posters serve as vital vehicles for scientific communication, yet their manual creation is a notoriously labor-intensive task. The project titled "**AI-Assisted Medical Poster Generator Using Multimodal Generative Models and Agentic Workflows**" introduces an automated, intelligent framework designed to transform dense research summaries and clinical findings into visually compelling, structured academic posters. Developed with a high-fidelity Streamlit frontend mirroring a professional dark-themed user interface, the system accepts medical inputs, structures the narrative according to the standard Introduction, Methods, Results, and Discussion (IMRaD) format, and maps these onto a classic three-column layout.

The core intelligence layer integrates large language models with programmatic rendering libraries such as python-pptx and ReportLab. By programmatically enforcing contrast ratios and typographic hierarchies aligned with the Web Content Accessibility Guidelines (WCAG) and medical communication standards, the generator mitigates typical layout errors such as text overflow, misalignments, and visual clutter. The generated posters are rendered in editable PowerPoint format, allowing seamless human-in-the-loop refinement. Ultimately, this project demonstrates a highly robust application of generative AI in medical laboratory technology education and professional dissemination, saving significant drafting hours while upholding clinical accuracy and design excellence..

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