UR-239 Human-AI Annotator Tool

Abstract

The HK-01 Human-AI Annotator Tool is a web-based system developed to facilitate the annotation of Electronic Health Records (EHRs) for mental and behavioral health, using ICD-10 codes. The tool allows multiple expert annotators to tag critical information, making it easier to catalog patient data accurately. Future plans include integrating AI to streamline and scale the annotation process, improving both efficiency and accuracy.

Introduction

Our annotator tool addresses the critical need for accurate and efficient annotation of mental health data within EHRs. Using ICD-10 codes, it enables annotators to tag essential segments of health records, improving accessibility and quality of patient care documentation. The tool's collaborative design allows multiple annotators to work together, creating a foundation for enhanced human-AI teamwork in healthcare.

Research Question(s)

- How can annotation tools improve EHR mental health records?
- How can AI and LLMs be effectively integrated for scalable annotations?
- What challenges arise in annotating sensitive data like mental health records?

Methods

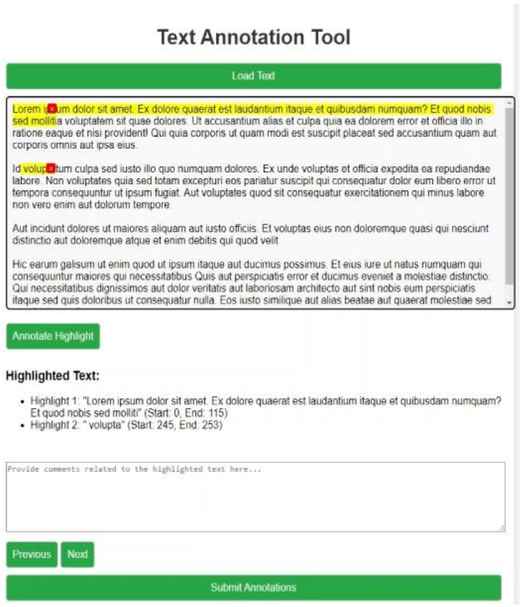
Technologies Used: Python, JavaScript, HTML, CSS, Flask, Fast API
Future Enhancements: AI integration like sentiment analysis for pre-annotating and report detailing
Development Approach: Iterative debugging and improvement of an existing codebase.
Key features:

- **Data Loading**: EHR text files are loaded via FastAPI and Flask, displaying on the frontend
- **Annotation**: Users can highlight, tag, and remove highlights easily with JavaScript enabling text selection and tagging functionality
- **Saving/Retrieval**: Annotations are saved in a CSV format, making the data accessible and easy to manage

Results

Core Functionalities Developed: Implemented essential features like text selection, highlighting, indexing, and navigation, along with saving and retrieving annotations.
Single-User Interface: Designed a user-friendly interface for efficient annotation, optimized for a single user but built with scalability in mind.
Foundation for Future Development: Established the backend and code structure to support future enhancements, including AI-driven features and multi-user capabilities.

Existing Codebase: This project gave us an opportunity to continue the production of an inherited codebase, so instead of writing new code we had to learn to review and debug unfamiliar code
Collaborative Project: Unlike many individual assignments throughout our time at Kennesaw, this project is strictly collaborative. It was one of the first experiences where we had to coordinate tasks, manage version control, and work to meet goals.
Developed a Tool for Healthcare: We learned to work with sensitive information which required keeping the data private and secure.
Planning for AI: With AI and Large Language Models in particular exploding in capabilities, this project allows us to attempt to utilize them in an environment we believe to be ideal.



Future Plans

The next steps for this project is to implement the AI integration to automatically annotate the EHR which would help healthcare professionals to be more effective and have a more convenient annotating tool. Additionally, we will finalize the code and ensure minimal bugs at the end of the project batch.

Conclusions

Our project aimed to improve the accuracy and efficiency of mental health annotations in EHR records, with a view toward potential AI integration. Through our development efforts, we've established the foundation of the annotation tool, including text selection, highlighting, and data retrieval. Looking forward, we plan to expand this foundation to support multiple annotators and incorporate AI capabilities to assist users, further enhancing the tool's scalability and usability.

This project gives us a better understanding on how collaboration works in software development, what the different roles are and the coordination that is needed to complete tasks. It also gives us a portfolio piece that demonstrates our ability to adapt to existing codebases, implement solutions, and explore AI applications. It is a valuable experience for preparing us for future roles as well as a practical view of AI applications.

Acknowledgments

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