Literature Review

Motivation

Health communication in healthcare is a crucial part in the care healthcare process. However, consultation or gaining trueful and accurate medical information from medical professionals can prove difficult with a lack of time or money. A simple search online could yield misleading information or may not yield answers in a timely fashion depending on the severity of the case.

Spinal injuries are of special interest in the health care world not only because of the liability risk involved with wrongful diagnosis but also the varying severity of injuries sustained in the area. Doctors when providing care to spinal cord related injuries must take special care to ensure the safety of the patient and provide important and accurate instructions for injury recovery. Because of this, the need for accuracy in any model professing knowledge in this area is paramount and must be robust against incorrect instructions to prevent misinformation reaching patients.

We aim to propose a medical chatbot utilizing the latest in Natural Language Processing to take a hybrid 2 step approach to address a situation, provide basic details about proper health care, and then pass info verification to eliminate potentially false information delivered by the bot.

Background

Verte aims to bridge the gap between expert knowledge and patient accessibility. For the lay reader, the integration of advanced NLP technology like Mistral 7b into a healthcare chatbot might seem esoteric. However, for an expert, Verte represents an essential study into how AI can replicate and support the complex decision-making process in spinal injury rehabilitation. This study is not only about technological innovation but also about filling a gap in patient care where timely and expert-backed information is vital. This study aims to unravel the complexities and potential of implementing a language model in a clinical context, presenting a compelling case for AI as a supplemental tool in patient care and medical decision-making.

Related Studies

1. **Clinical Outcome Prediction (2021) by Aken et al.**: This study achieved significant strides in predicting clinical outcomes from admission notes using a self-supervised model. By integrating diverse sources of medical data, the research demonstrated how AI can enhance understanding and prediction in clinical settings.
2. **CliCR Dataset (2018) by Šuster and Daelemans:** This research focused on creating a comprehensive dataset for machine reading comprehension in the clinical domain. It

achieved a new level of data depth and complexity, paving the way for more sophisticated NLP models in healthcare.

3. **BIGBIO Framework (2022) by Fries et al.:** This study developed a data-centric framework for biomedical NLP, achieving an integrative approach to handle diverse biomedical language data. The framework represented a significant advance in organizing and processing complex biomedical texts for AI applications.

VERTE

At the heart of VERTE is the Mistral 7b model, fine-tuned with a bespoke dataset enriched with medical terminologies and patient scenarios. The model is the backbone of VERTE's diagnostic capability, enabling it to provide validated medical advice. This iterative process of model training and validation ensures that VERTE operates at the forefront of medical AI technology.

Impact

By providing validated and immediate health information, VERTE stands to benefit not only patients but also medical professionals, mitigating the risks associated with misinformation and enhancing the overall standard of patient care. Our model will not only minimize the chance of a patient receiving faulty information but also greatly expedite the process for doctors to deliver feedback, instructions, and accurate healthcare information to the patient.

Sources

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[2] S. Suster, W Daelemans, "CliCR: A Dataset of Clinical Case Reports for Machine Reading Comprehension", Computational Linguistics & Psycholinguistics Research Center, University of Antwerp, Belgium, Mar. 2018.

[3] J. A. Fries, L. Weber, N. Seelam, G. Altay, etc.., "BIGBIO: A Framework for Data-Centric
Biomedical Natural Language Processing" Equal Contribution, Jun. 2022.

[4] R. E. Wang, E. Durmus, N. Goodman, T. B. Hashimoto, "Language Modeling via Stochastic Processes", Stanford University, May 2023.