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STUDYING THE CAPABILITIES OF THE SURGERY-3 CHATBOT FOR 4TH-YEAR STUDENTS OF GOMEL STATE MEDICAL UNIVERSITY

Introduction

The integration of chatbots into surgical settings has attracted considerable interest due to their potential to enhance patient engagement, streamline communication, and improve surgical outcomes. Chatbot technology, based on advances in artificial intelligence (AI) and natural language processing (NLP), offers a new approach to assisting both patients and healthcare providers in a variety of surgical processes. Chatbots can also be successfully used for medical education [1–3].

Goal

The main objective of this study is to explore the capabilities of the Surgery-3 Chatbot, specially developed for fourth-year students of the Gomel State Medical University.

Material and methods of research

We used the following teaching materials and technologies:

- Teaching materials of the Department of Surgical Diseases No. 3,
- Sabiston Textbook of Surgery E-Book,
- Schwartz’s Principles of Surgery,
- 100 Cases in Surgery,
- FMGE Solutions – MCI Screening Examination,
- RAG (Retrieval-Augmented Generation) is a technology that combines information retrieval and text generation based on the found data [4],
- DeepSeek [5] – a machine learning model for natural language processing (NLP) that can be used for text analysis and generation,
- AnythingLLM [6] – a platform for creating chatbots and intelligent assistants based on NLP,
- Telegram API – for creating and integrating a chatbot into Telegram,
- Local server – for deploying the system and ensuring its operation in a local network without Internet access.

The same learning materials in the form of a knowledge graph and text data retrieval system were used to implement the RAG technology. After configuring the DeepSeek model to work with medical terminology, this model was used to generate text based on the information found. Integration with AnythingLLM was done by installing and configuring the AnythingLLM platform on a local server. The RAG model was then connected to AnythingLLM to provide intelligent interaction with users.

For the convenience of students, in addition to the AnythingLLM platform interface, we also developed a chatbot for Telegram. For this, we used the Telegram API to create a chatbot. We then connected the chatbot to the RAG model to process requests and generate responses, conducted tests on real users to evaluate the effectiveness and make improvements.

The results of the research and their discussion

The result of our work was the creation of the chatbot Surgery-3. A screenshot of the computer screen with our Telegram chatbot is shown in Figure 1.

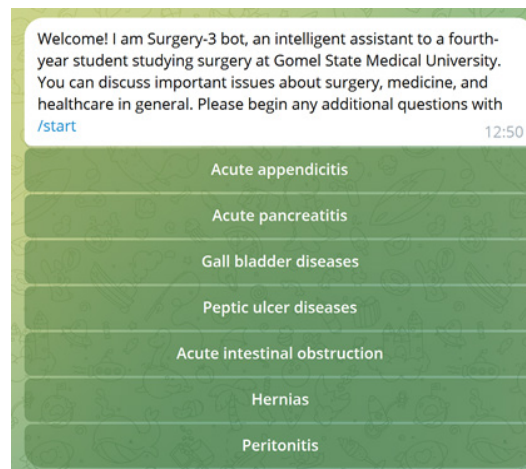


Figure 1 – Screenshot of Telegram chatbot Surgery-3

The process of generating a response to the Hernia topic request is shown in Figure 2. It should be noted that the chatbot offers three options for a question on the topic of hernia and gives an answer to the selected question. It is also possible to write your question at the bottom of the screen.

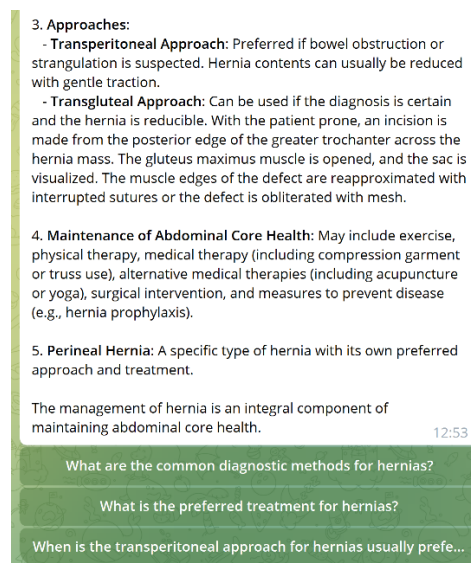


Figure 2 – An example of our chatbot working on the topic of Hernias

Our chatbot effectively processes multiple-choice test questions (e.g., FMGE Solutions) with key results:

1. Successfully processes copied questions from tests.
2. Analyzes questions and extracts relevant information.
3. Adapted for medical terminology, crucial for FMGE questions.
4. Extracts and structures information from large text volumes.
5. Average processing time is 2–3 seconds.
6. Ensures high performance and data security on a local server.

The chatbot Surgery-3 operates at <https://t.me/@Surgery3Bot>. Advantages include personalized answers, availability during limited internet connectivity, 24/7 access, and high query processing speed. Limitations involve challenges with complex clinical questions and the need for regular knowledge updates.

Conclusion

The Surgery-3 chatbot we developed enables more efficient study of the Surgical Diseases course topics. Using the teaching materials of the Surgical Diseases Department #3 in combination with international surgery textbooks enables better preparation for the surgery exams.

LITERATURE

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LEVERAGING ARTIFICIAL INTELLIGENCE FOR PERSONALIZED ERPM EXAM PREPARATION AMONG SRI LANKAN MEDICAL STUDENTS STUDYING ABROAD

Introduction

The increasing mobility of students in international medical schools has created a diverse cohort of aspiring healthcare professionals. Despite their competence, Sri Lankan students returning home must pass the ERPM to qualify as registered physicians. The transition from foreign curricula to the requirements of the Sri Lanka Medical Council presents significant challenges that require innovative teaching methods [1].

There are next challenges faced by Sri Lankan students preparing for the ERPM [2].

1) Differences in medical curricula: differences in course structures, clinical exposure, and assessment styles between overseas universities and Sri Lanka.

2) Language barriers: many students study in a non-English or non-Sinhala/Tamil environment, making it difficult to adapt.

3) Limited access to standardized resources: availability of specific preparation materials for the ERPM is poor compared to standardized exams such as the USMLE or PLAB.

There is now a growing role for AI in supporting these students by providing structured, adaptive, and personalized learning experiences [3, 4].

Goal

The aim of this paper was to analyze the results of a survey conducted among last year's Sri Lankan students on the use of artificial intelligence technologies to prepare for postgraduate examinations in surgery.