iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** IV **Month of publication:** April 2023

DOI: https://doi.org/10.22214/ijraset.2023.50502

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue IV Apr 2023- Available at www.ijraset.com

Medical Chatbot in Machine Learning

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Abstract: ***This article suggests a medical chatbot that uses machine learning methods to provide personalised healthcare assistance. The chatbot is intended to interact with patients, collect information about their symptoms, medical history, and other pertinent details, and give treatment guidance and recommendations. Natural language processing (NLP) algorithms are used in the suggested chatbot to comprehend patients' requests and provide pertinent answers. It also analyses medical documents and other data using machine learning algorithms to provide personalised health suggestions. To provide efficient and cost-effective medical treatment, the chatbot can be combined with current healthcare systems. This article also examines the possible advantages of using robots in the medical field, such as increased patient involvement, lower healthcare costs, and easier access to medical guidance. The findings of this study show that a chatbot for medical uses is feasible and successful, highlighting the potential for future research in this area.***
Keywords: Symptoms, Diagnosis, Treatment, Medications, Side effects, Dosage, Prevention

I. INTRODUCTION

The healthcare business is always looking for methods to improve patient care while lowering expenses. One possible answer is to use chatbots driven by machine learning algorithms in the medical realm. Chatbots have grown in popularity in recent years as a result of their ability to interact with patients in a natural and conversational way, as well as their ability to provide personalised healthcare support.

A medical chatbot powered by machine learning algorithms can do everything from answer basic health queries to provide more complex medical guidance. The chatbot can comprehend patients' queries and provide pertinent answers by using natural language processing (NLP) algorithms. The chatbot can also analyse medical documents and other data using machine learning algorithms to provide personalised health advice.

The incorporation of a medical chatbot into current healthcare networks can provide a number of advantages. It can improve patient involvement by providing easy and available healthcare support, lower healthcare costs by streamlining mundane chores, and increase access to medical guidance for patients who would otherwise struggle to access healthcare services.

Regardless of the possible advantages, developing and deploying a medical chatbot necessitates careful evaluation of ethical and legal consequences. Keeping patient data private and safe, for example, is a critical worry. Chatbots must also be created with the help of medical specialists to ensure that they provide accurate and dependable medical guidance.

This paper suggests and investigates the potential advantages and drawbacks of a medical chatbot built using machine learning algorithms. The rest of the document is structured as follows: Section 2 delves into connected research in the fields of medical chatbots as well as machine learning. Section 3 describes the design and functionality of the suggested chatbot. Section 4 shows the findings of a feasibility investigation on the effectiveness of the chatbot. Finally, Section 5 brings the paper to a close by discussing potential research directions.

II. RESEARCH IN THE FIELD OF MEDICAL CHATBOTS

Medical chatbots have received a lot of attention in recent years because they offer the ability to provide a wide population with affordable, accessible, and personalised healthcare services. Here are a few study areas in the realm of medical chatbots:

Natural Language Processing (NLP): NLP is an important component of chatbots since it assists in understanding and processing user natural language input. Researchers are aiming to increase the accuracy of chatbot responses by creating more advanced NLP algorithms.

User Experience (UX): Another key feature of chatbots is their user experience, which has a large influence on their adoption and usage. Researchers are investigating how to create chatbots that are simple to use, engaging, and offer a favourable user experience.

Medical Knowledge Base: In order to deliver correct and reliable information to users, medical chatbots require access to a significant quantity of medical knowledge. Researchers are focused on expanding and modernising medical information sets that can be integrated into chatbots.

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Privacy and security: Because medical chatbots handle sensitive and confidential health information, it is critical to ensure that user data is secure and private. To protect user data, researchers are investigating approaches such as encryption, tokenization, and access control.

Clinical Validation: Before deploying medical chatbots in clinical settings, it is critical to test their clinical correctness. Researchers are creating clinical validation standards to assess chatbot effectiveness in identifying and treating medical diseases.

III. METHODOLOGY

Medical chatbot methodology often includes the following steps:

Determine the issue: The first stage is to determine the healthcare issue that will be addressed by the chatbot. This could range from giving medical advice to addressing frequently asked health-related questions.

Create a knowledge base: In order to deliver correct and reliable information to users, the chatbot need access to a tremendous quantity of medical knowledge. A knowledge base is created by gathering and analysing medical information from a variety of sources, including medical textbooks, research papers, and clinical recommendations.

Create the chatbot: Natural Language Processing (NLP) techniques are used to create the chatbot, which allows it to interpret and reply to natural language input from users. To ensure that it can accurately answer medical inquiries, the chatbot is trained on a big dataset of medical literature.

Test and validate the chatbot: After the chatbot is built, it must go through a series of testing and validation methods to assure its performance and accuracy. This entails putting the chatbot through its paces with a small sample of users and assessing its performance in terms of correctness, speed, and user experience.

Deploy the chatbot: Once the chatbot has been tested and approved, it is placed on the website, social media platforms, or mobile applications of the healthcare provider.

IV. LITERATURE REVIEW

Here is a brief survey of the medical chatbot literature:

Lee and colleagues' (2020) paper "A Review of Chatbots in Healthcare: Advancing Conversational AI for Patient and Clinical Communication" presents a comprehensive assessment of the literature on the usage of chatbots in healthcare. The authors emphasise the potential benefits of chatbots, such as increased patient engagement, lower healthcare costs, and improved access to care.

Tielman and Neerincx's (2019) "Chatbots in Mental Health: A Review of the Literature" examines the usage of chatbots in mental health settings. The authors suggest that chatbots have the potential to give individuals with accessible and personalised mental health support.

Kim and colleagues (2020) analyse the effectiveness of a chatbot in delivering health education to college students in "Evaluating the Performance of a Chatbot in Providing Health Education to College Students: An Exploratory Study." The chatbot was proven to be successful in boosting students' health knowledge and behaviors, according to the authors.

Snoswell and colleagues' (2020) paper "Designing and Developing a Conversational Agent for Patients with Chronic Kidney Disease: A User-Centered Approach" details the creation of a chatbot for patients with chronic kidney disease. The authors emphasise the need of using a user-centered approach while developing chatbots for healthcare.

Liu and colleagues' (2021) paper, "The Effectiveness of Chatbots in Health Education: A Systematic Review and Meta-Analysis," provides a systematic review and meta-analysis of the usefulness of chatbots in health education.

V. FUTURE ASPECTS

Medical chatbots have the potential to completely transform healthcare delivery in the future. Here are some potential applications for medical chatbots in the future:

Personalization: Medical chatbots can be tailored to each user's medical history, lifestyle, and preferences. Chatbots will be able to deliver personalised health advice and recommendations to users in the future, enhancing their health outcomes.

Medical chatbots can be combined with electronic health records (EHRs) to offer healthcare practitioners with real-time patient data, enabling for more personalised and efficient healthcare delivery.

Medical chatbots can be connected with other healthcare technology, such as wearables and telemedicine, to give users with a more comprehensive and seamless healthcare experience.

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Machine Learning and Artificial Intelligence (AI): As machine learning and AI improve, medical chatbots will become more complex, able to provide users with more accurate and personalised healthcare suggestions.

Medical chatbots can extend the reach of healthcare services to underprivileged people and rural places where access to healthcare is limited. Chatbots may be able to deliver more advanced healthcare services in the future, such as remote monitoring of chronic illnesses and prescription management.

Overall, medical chatbots have a bright future, with the potential to improve healthcare delivery and outcomes for a wide population. Medical chatbots will become more sophisticated as technology advances, allowing them to provide users with more personalised and complete healthcare services.

VI. CONCLUSION

Finally, medical chatbots have emerged as an intriguing approach for improving healthcare delivery and results. They have the potential to provide a huge population with accessible, personalized, and efficient healthcare services. To produce a chatbot that can deliver accurate and reliable healthcare information to consumers, the technique for designing medical chatbots needs a combination of technical, design, and medical understanding. The literature on medical chatbots emphasises its potential benefits, which include increased patient participation, lower healthcare costs, and more access to care.

In the future, medical chatbots will become more intelligent, allowing users to receive more personalised and complete healthcare services. Medical chatbots will be able to deliver more accurate and personalised healthcare advice to users as machine learning and AI advances. They will also be combined with other healthcare technology, such as wearables and telemedicine, in order to give users with a full and seamless healthcare experience. Overall, the future of medical chatbots appears bright, with the potential to transform healthcare delivery and results.

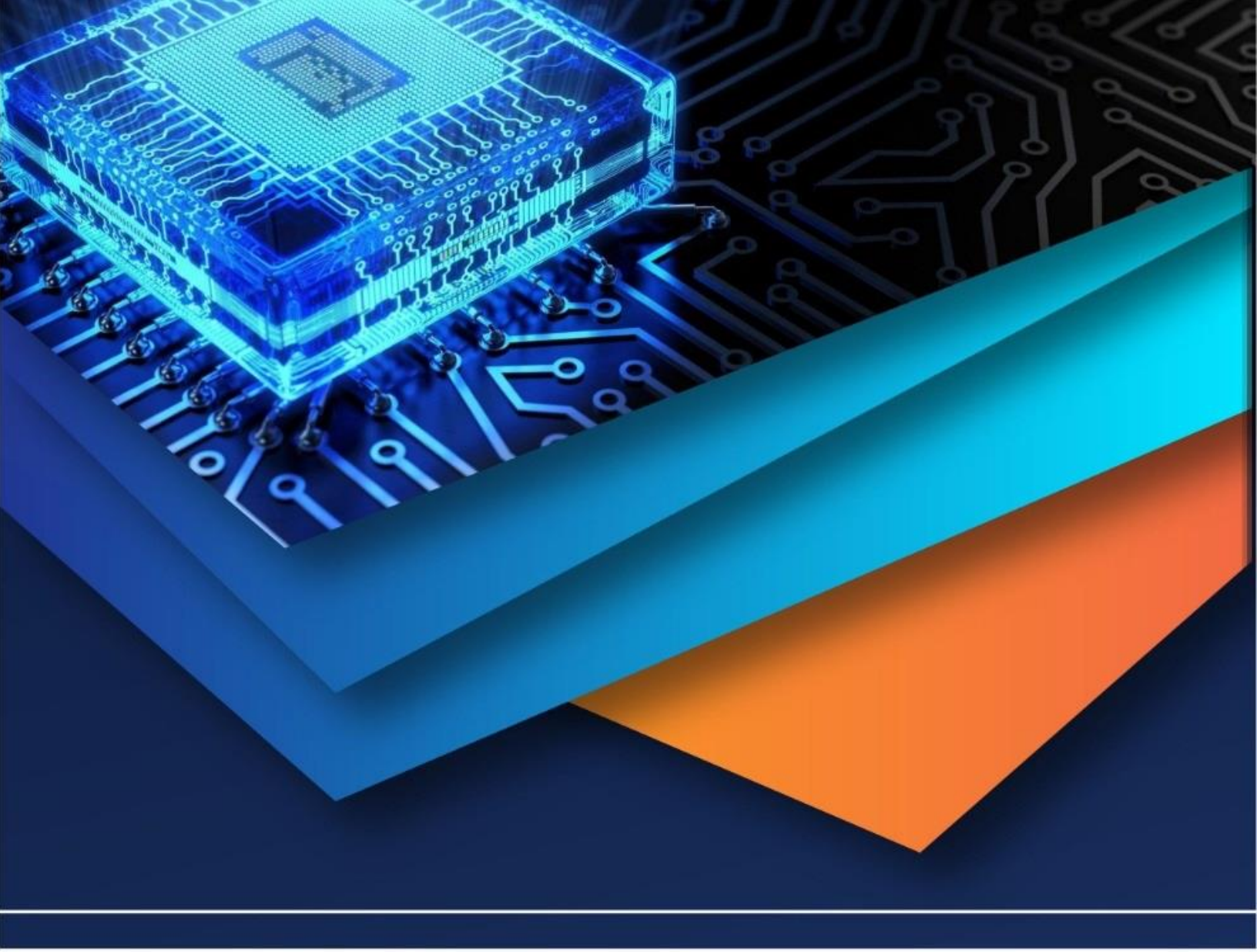
VII. ACKNOWLEDGEMENT

We are indeed extremely grateful to Zcst's Thakur Shyamnarayan Degree College and the management of the college for granting us the permission to use infrastructural facilities and also for moral boosting, cooperation and support throughout the tenure of the research paper. I also wish to extend my heartfelt gratitude towards my guide Ms.Aishwarya Sedamkar maam for her guidance throughout my project. attendance for her timely support and cooperation without which completion of this research paper was not possible.

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