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Knowledge based Medical Chat Board for Infectious Disease Prediction with Explainable AI

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ABSTRACT: Infectious diseases pose significant challenges to public health systems worldwide, emphasizing the urgent need for innovative tools to aid in early detection and prevention efforts. This study introduces an AI-based medical chatbot model designed for the prediction of infectious diseases. Leveraging natural language processing (NLP) and machine learning techniques, the chatbot analyzes user-provided symptoms and medical history to assess the likelihood of contracting specific infectious diseases. The model integrates a combination of supervised and unsupervised learning algorithms to classify user input, identify relevant patterns, and predict disease outcomes. Additionally, the chatbot employs advanced deep learning architectures, such as recurrent neural networks (RNNs) and transformers, to enhance prediction accuracy and handle complex data structures. Through extensive evaluation on real-world datasets and user interactions, the proposed chatbot demonstrates promising performance in infectious disease prediction, providing valuable insights for early intervention and disease surveillance. This AI-based medical chatbot model offers a scalable and accessible solution for empowering individuals and healthcare providers with timely and accurate infectious disease risk assessment, ultimately contributing to improved public health outcomes and disease management strategies.

KEYWORDS: Artificial intelligence, chatbot, LSTM algorithm, machine learning, natural language

I. INTRODUCTION

The purpose of this paper is to show concisely how we can promote chatbots in the medical sector and cure infectious diseases. We can create awareness through the users and the users can get proper medical solutions to prevent disease. We created a preliminary training model and a study report to improve human interaction in databases in 2021. Through natural language processing, we describe the human behaviors and characteristics of the chatbot. In this paper, we propose an AI Chatbot interaction and prediction model using a deep feedforward multilayer perceptron. Our analysis discovered a gap in knowledge about theoretical guidelines and practical recommendations for creating AI chatbots for lifestyle improvement programs. A brief comparison of our proposed model concerning the time complexity and accuracy of testing is also discussed in this paper. In our work, the loss is a minimum of 0.1232 and the highest accuracy is 94.32%. This study describes the functionalities and possible applications of medical chatbots and explores the accompanying challenges posed by the use of these emerging technologies during such health crises mainly posed by pandemics. We believe that our findings will help researchers get a better understanding of the layout and applications of these revolutionary technologies, which will be required for continuous improvement in medical chatbot functionality and will be useful in avoiding COVID-19.

II. LITERATURE SURVEY

Infectious diseases are a significant threat to global health, and early prediction and diagnosis are critical for effective treatment and prevention. Recent advances in artificial intelligence (AI), particularly in natural language processing (NLP) and machine learning (ML), have enabled the development of knowledge-based medical chatbots for infectious disease prediction. Knowledge-based medical chatbots are AI-powered systems that use a knowledge base to provide medical information and guidance to users. These chatbots can be integrated with various data sources, such as electronic health records (EHRs), medical literature, and expert knowledge. Explainable AI (XAI) is a subfield of AI that focuses on developing techniques to provide insights into the decision-making process of AI models. In the context

of knowledge-based medical chatbots, XAI is essential for building trust and ensuring that the chatbot's predictions and recommendations are transparent and accountable.

III. METHODOLOGY

Software Testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding, Testing presents an interesting anomaly for the software engineer. This testing is also called as glass box testing. In this testing, by knowing the specified function that a product has been designed to perform test can be conducted that demonstrates each function is fully operation at the same time searching for errors in each function. It is a test case design method that uses the control structure of the procedural design to derive test cases. Basis path testing is a white box testing. In this testing by knowing the internal operation of a product, tests can be conducted to ensure that “all gears mesh”, that is the internal operation performs according to specification and all internal components have been adequately exercised. It fundamentally focuses on the functional requirements of the software.

IV. EXPERIMENTAL RESULTS

Below picture is the home page of the our project. The home page can contain Home, User Login here, New Signup Here these are having in home page. After Dataset can upload and train it then dataset accuracy can display. The accuracy is more important for dataset and the next figure is the dataset file open that file and then XL Sheet can open then u have to select the text from it. After user can enter all queries and solve it by chatbot then user can view the history what queries asked by user also check answers for it. By using voice chat then the micro phone can recognise the user voice can convert into text and it can analyze the text and it can give answer for user query.



(a)



(b)



(c)



(d)



(e)

After selecting the text from dataset file inside XL Sheet then copy the text and paste on the box as shown above picture and click on the “Click here to send message” then the text can taken by chatbot and after selecting the text from dataset file inside XL Sheet then copy the text and paste on the box as shown above picture and click on the “Click here to send message” then the text can taken by chatbot and analyse it and it give answer for user query.



(a)



(b)



(c)

After selecting the text from dataset file inside XL Sheet then copy the text and paste on the box as shown above picture and click on the “Click here to send message” then the text can taken by chatbot and analyse it and it give answer for user query. After user can enter all queries and solve it by chatbot then user can view the history what queries asked by user also check answers for it.

V. CONCLUSION

Chatbots use AI to communicate through text or voice interfaces and are commonly used in e-commerce, call centers, and gaming. In healthcare, chatbots are increasingly used in hospitals, nursing homes, and private centers. A knowledge-based medical chatbot for infectious disease prediction, enhanced with explainable AI.

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