AI Healthcare Chatbot

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Abstract: In a country like our India where the population is huge, the requirement of doctors is also huge. But the doctor patient ratio in India is 1:1456 against the WHO recommendation of 1:1000. This shortage of doctors often results in delay in disease diagnosis and treatment. To tackle this problem there is a need of an intelligent chatbot that would advice doctors and even patients based on the researched dataset which is used. Chatbots are programs built to automatically work on the received messages. A chatbot will communicate with a real person. When the user types in its query the chatbot will fetch the answer through AI and communicate it to the user in the form of text. The AI healthcare chatbot can suggest the diagnosis based on the given symptoms by using the researched dataset trained by using machine learning. It could also assist hospitals with giving medical care support 24x7, thus reducing the workload on doctors.

Key Words: Chatbot, Healthcare, Artificial Intelligence.

1. INTRODUCTION

Computers give us information; they engage us and help us in a lot of manners. A chatbot is a software or computer program that simulates human conversation or "chatter" through text or voice interactions. Yet, this paper concentrates only on text. These systems can learn themselves and restore their knowledge using human assistance or using web resources. This application is incredibly fundamental since knowledge is stored in advance. The system application uses the question-and-answer protocol in the form of a chatbot to answer user queries. This system is developed to reduce the healthcare cost and time of the users, as it is not possible for the users to visit the doctors or experts when immediately needed to diagnose a disease. The response to the question will be replied based on the user query and knowledge base. The significant keywords are fetched from the sentence and answer to those sentences, if the match is discovered or the significant, answer will be given, or similar answers will be displayed. Here the users can type in the symptoms they are facing and the chatbot will fetch the dataset with correct diagnose of disease/illness. It will also provide you the doctors details such as name, prognosis, website, etc if asked. The chatbot is made using python programming language. Frontend is made using html, css and javascript.

2. RESEARCH METHODOLOGY

2.1 Surveying Existing System
Subsequent to experiencing a portion of the project with respect to usage utilizing the chatbot for medical and healthcare purposes, it was found that this idea is searched a lot and is a mainstream idea which is still in advance. The advances utilized were not just productive and solid yet in addition financially achievable. Not only this, here other very useful parameters of using chatbot in healthcare were observed too.

2.2 Main body
The health-Care Chat Bot System was written in Python and run Google conversation platform Google Dialogue flow, GUI hyperlinks and an easy, reachable community API. It ought to offer a potential parallel operation and machine layout have to now no longer introduce problems with ease-of-accessibility. The machine ought to be dependable sufficient to run, crash and glitch loose extra or much less indefinitely, or facilitate blunders recuperation sturdy sufficient such that system faults are by no means discovered to its stop-customers.

2.3 Objective
Their objective behind the use of chatbot was to provide medical assistance to patients with some common diseases such as colds, flu, typhoid, malaria, jaundice, etc. without the need of physically visiting the health centers. Their innovative idea to use chatbot

in a medical field indeed otherwise a great thought with the constant rising population of the nation. A few years ago, there are many models of medical dialogue that have been around an invention that was too expensive for the average person, but they have tried to overcome this back in their healthcare chatbot program.

3. PROPOSED SYSTEM

The objective of the system is to build an artificial intelligence based chatbot for healthcare using python programming language. There are numerous chatbots being used today however this particular chatbot is for making healthcare and healthcare industry more flexible, by making patients easily connect with the healthcare provider. In this chatbot we will be using a dataset containing various symptoms along with the disease related to those symptoms. Whenever the user will type in the symptoms, he/she is facing, the chatbot will fetch the dataset for those symptoms and answer the user about what type of disease it could be. We will also be using a dataset containing a list of doctors belonging to different areas of expertise, for example dermatologists, gynaecologist, orthopaedist, etc from different locations along with their details. If user wants to know the nearby doctors or have communication with a doctor curing that particular disease the chatbot will provide the user, with the details of the same. This chatbot will have a user-friendly interface. This chatbot will be very useful for patients wanting an immediate response to a particular symptom as it will be working 24x7.

3.1 Functional Block Diagram
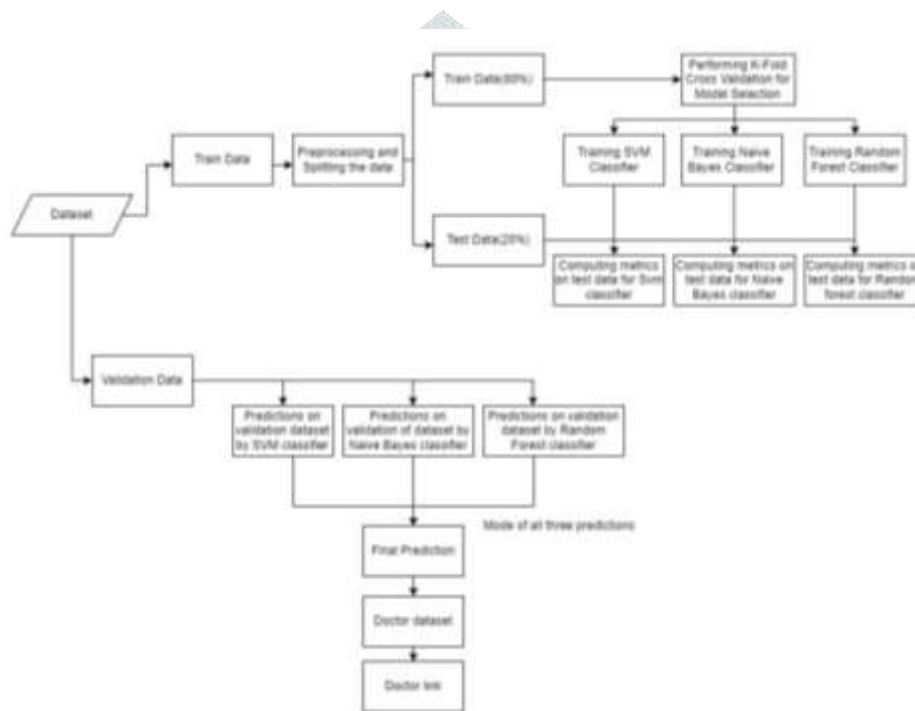
fig. 3.1.1 block chain diagram

3.2 Classifier algorithms

- **SVC**
  The objective of a Linear SVC (Support Vector Classifier) is to fit to the data you provide, returning a "best fit" hyperplane that divides, or categorizes, your data. From there, after getting the hyperplane, you can then feed some features to your classifier to see what the "predicted" class is.

- **Gaussian NB**
  In Gaussian Naive Bayes, continuous values associated with each feature are assumed to be distributed according to a Gaussian distribution. The Gaussian distribution is the healthy-studied probability distribution. It is for nonstop-valued random variables.

- **Random forest classifier**
  A random forest is a meta estimator that fits a number of decision tree classifiers on various sub-samples of the dataset and uses averaging to improve the predictive accuracy and control over-fitting.

4. IMPLEMENTATION PLAN

Our Health-Care Chatbot is implemented as a web application. Health-Care Chatbot uses Artificial Intelligence and Machine Learning technologies. The best programming language for implementing the AI and ML technologies is Python. To deploy the Chatbot on the web we have used Flask Framework. The chatbot uses a dataset with approximately 130 different symptoms and 40 different types of diseases. This dataset was then cleaned, and the string fields were encoded to numerical form. After that the data is now used to train the machine learning model. The Classification Algorithms and machine learning models that are used to train

the dataset are Support Vector Classifier (SVC), Gaussian Naive Bayes and Random Forest Classifier. The models are implemented in Python using SVC, GaussianNB and RandomForestClassifier modules from sklearn library. After training the three models we will be predicting the disease for the input symptoms by combining the predictions of all three models. This makes our overall prediction more robust and accurate. The input symptoms will be matched to the symptoms in the dataset and the disease will be predicted accordingly. We have also used another dataset that includes the list of some doctors of Mumbai and the web link to their web page. So according to the disease that is predicted the web link of the doctor that is specialized for that particular disease treatment is provided.

5. RESULT
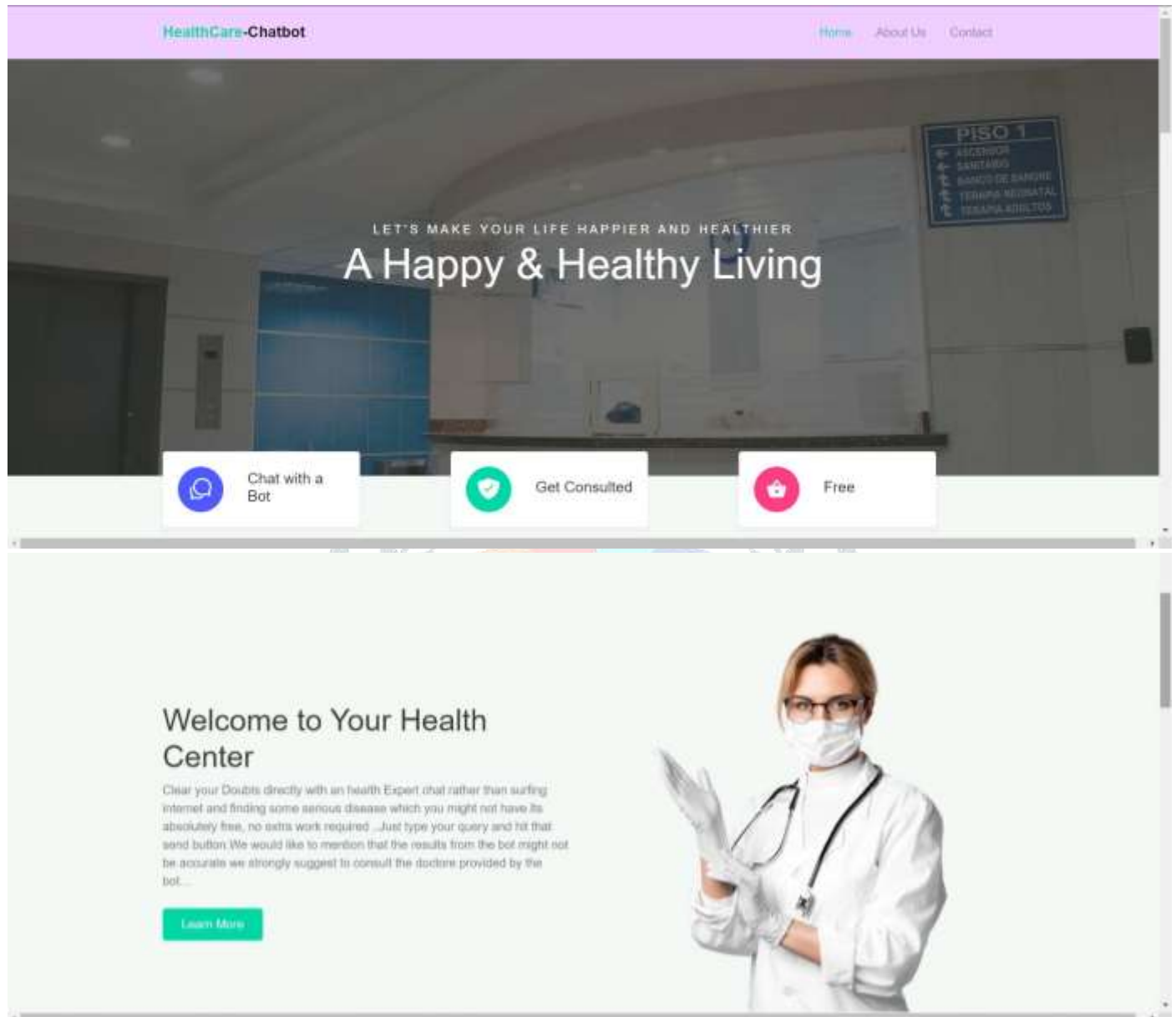
fig. 5.1.1 website homepage
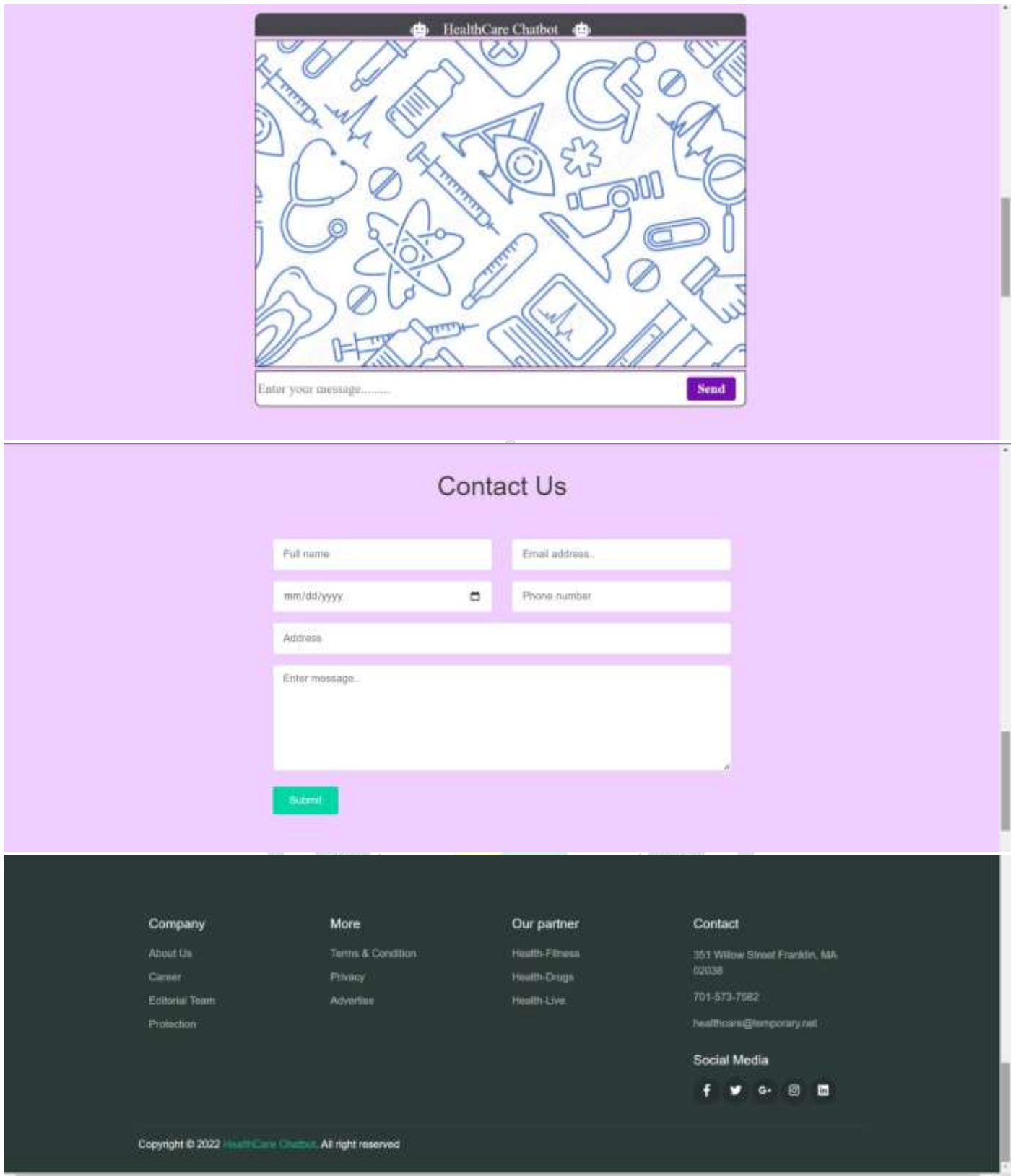
fig. 5.1.2 chatbot interface
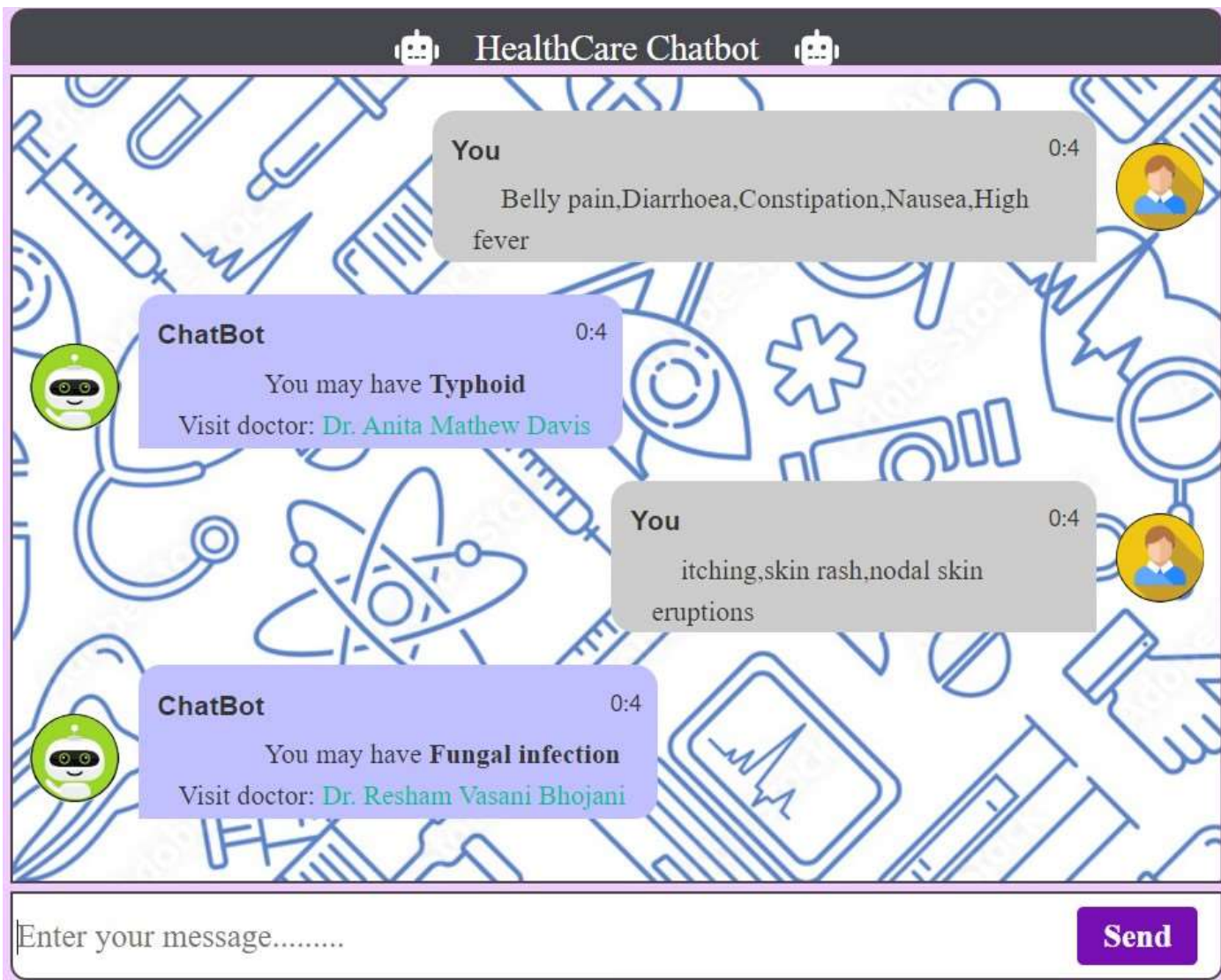
fig. 5.1.3 chatbot interactive result

fig. 5.2.1 doctors' dataset

fig. 5.2.2 disease prognosis dataset

6. CONCLUSION

A Chatbot is a great tool for conversation. Here the application is developed to provide quality of answers in a short period of time. It removes the burden from the answer provider by directly delivering the answer to the user using an expert system. The project is developed for the user to save the user their time in consulting the doctors or experts for the healthcare solution. Here we developed the application using machine learning. Future scope of this chatbot is very vast. The smartness and intelligence of this chatbot can be increased by conducting more study and increasing the database so that Chabot could answer all type of question about every type of disease. Audio system can also be included in this system to make this Chabot more interactive.

2.4 References

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