Medbot-Medical Diagnosis System using Artificial Intelligence

Sanjay Kumar M[1,*], Vishnu Prasad Reddy G[1], Sai Ganesh K V[1], and N. Malarvizhi[2]

[1] UG Student, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai
[2] Professor, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai

Abstract

INTRODUCTION: One of the fastest developing technologies in the present world is the Virtual assistants. These assistants could manage with the medical-related tasks and helps both the providers as well as the patients. Through Artificial Intelligence, users can communicate through voice or text interface with the chatbot and also receive responses based on that. Basically, a chatbot can converse with a real person.
OBJECTIVES: In this paper, a chatbot named Medbot stands for Medical Diagnosis System using Artificial Intelligence mainly focusing of skin and eye related problems.
METHODS: The Medbot helps in connecting the available patients, make their appointments, helps in finding the specialized person and provide them access to get the accurate treatment.
RESULTS: This Medbot helps in providing healthcare support online for 24×7 and it also responds to common and precise questions.
CONCLUSION: It helps in generating the leads and forwarding them to the sales automatically. By querying the patients sequentially, it guides them with the problem they are facing with.

*Corresponding author. Email: Msanjaykuma6@gmail.com

1. Introduction

A malignant tumor quickly grows up and expands through typical brain regions. This is also called as brain cancer usually develops quickly, and sometimes invades stable brain regions or crowds. Such tumors often drain a regular brain's blood supply. Benign level brain tumors did not include tumor cells, and appear to develop gradually. Malignant level brain tumors split into two types: one is primary, another one is metastatic. Primary type brain tumors fire up within the skull. As tumor cells found anywhere in the body break apart and migrate into the brain, a metastatic tumor is created. Metastatic level brain tumors are often malignant. Mainly brain tumors are categorized according to the origin of the tumor, the amount of tissue affected, whether it is benign or malignant type, among other factors [1] [2] and now, the medical bot technology is gaining traction in health care, where it serves patients and providers helping to execute myriad tasks. Through Artificial Intelligence, users can communicate through voice or text interface with the chatbot and also receive responses based on that. Basically, a chatbot can converse with a real person. In this paper, a chatbot named Medbot stands for Medical Diagnosis System using Artificial Intelligence mainly focusing of skin and eye related problems. The Medbot helps in connecting the available patients, make their appointments, helps in finding the specialized person and provide them access to get the accurate treatment. Clinicians can also use chatbots to retrieve quickly and easily information related to drug relations and side effects. These chatbots question patients and compare answers to cases with their medical database. For these reasons, the accessibility of chatbots in healthcare system is relevant and more accessible. We have developed our Medbot using PHP and MySQL with WAMP server. One of the nice things about a chatbot is that it is so accessible that you can use it

on your smartphone. Chatbots also provide improved access to healthcare by delivering advice or counselling remotely at lower costs.

This could ease the burden on medical professionals. The most commonly employed algorithm for medbot is the random forest; it is one of the important model of classification that is able to classify the image with high precision. Random forest is a ensemble model that performs both classification and regression. So it is called as ensemble random forest (ERF). In training, number of decision trees is used; in output class, individual trees produce the class output. Combination of tree predictors is called as random forest. The basic principle of random forest is combining the week learners together to strong learner.

2. Objectives

The modern digital imaging systems helps in providing high-resolution images, which could be very useful in handling the clinical situations when compared to the conventional systems. Sliding window strategy is utilized in computing the Pitiful qualities. For any Dismal qualities for the adjoining obstructs in the left picture, the square areas in the left picture are moved by one pixel in the flat heading [3].

For any two nearby squares in the left picture is same with the correct picture then the entire computation of condition (2) ought to be subtracted from the Pitiful estimation of furthest left pixels and increase the value of the furthest right pixels to the past Tragic esteem [4]. For this situation, the request of figuring Dismal is changed. The Tragic estimations of all aberrations for a square in the left picture are determined [5] [6].

3. Methods

Considering the difficulties of the previously existing technology, initial analysis is done after which the whole activity will be computerized. The Medbot system had been proposed in this paper that focuses on the skin as well as the eye problems [7] [8]. The system proposed hereby could be accessed only by the User and the Admin. These two entities need to login the application with the valuable credentials to get access with the android system as represented in figure 1. Each tasks and module will be managed and accessed accurately once the Admin makes a successful login. The tasks performed by the admin includes login, arrange questions and answers, view the users, update hospital details and also update available doctors' details [9-13]. User needs to register to get credentials and after getting credentials they can view the webpage, view hospital details, view available doctors.
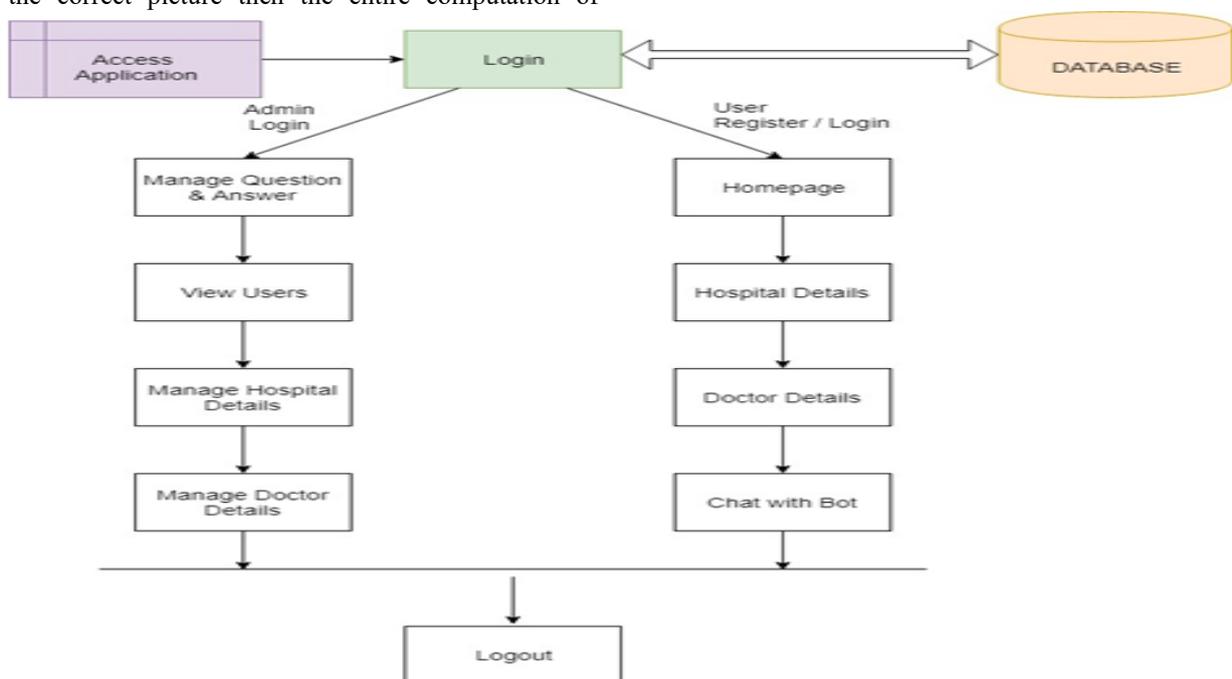

Figure 1.

3.1. Modules and Description

The proposed system contains the following modules:

- Home Page Module
- Admin Login Module
- User Login Module

Home Page Module

Home page module is the first page where admin and user interact with the chatbot. This module contains tags such as about us, contact us, admin login and user login.

About us: About us explains and gives a clarity to the user about the chatbot and how does it is useful to solve their health issues.

Contact us: Contact us consist of name, phone number, and email id of the administrators of the website. Users can contact the administrators using these details.

Admin login: This is the login page for the admin to manage the chatbot. The operations of the admin are explained in admin login module.

User login: This is the login page for the user to login to the chatbot and chat with the chatbot and solve their health issues. The detailed operations of user are explained in user login module.

Admin Login Module

Login: Admin can login by using credentials.

Manage Questions & Answers: Admin can arrange questions and answers.

View Users: Admin can see the details of the user who has used the chatbot.

Manage Hospital Details: Admin can add, update, and delete hospital details into the chatbot.

Manage Doctor Details: Admin can add, update, and delete details of available doctor into the chatbot.

User Login Module

Logins used by websites, computer applications, and mobile apps, are a security measure designed to prevent unauthorized access.

Registration: User needs to register to get credentials.

Login: User can login using credentials

Homepage: User can view the webpage

Hospital Details: User can see the hospital details

Doctor Details: User can view the available doctors.

Chat with Bot: User can chat with both regarding the query and solve their health issues.

4. Results

In this paper, we have described a Medbot system that was designed to support patients and health professionals exclusively for eye and skin problems. Patient's perceptions regarding enjoyment and attachment bond with the medbot are also found to be good. Table 1 and 2 shows the sample eye diseases and skin diseases with symptoms and suggestions respectively.

Table 1. Eye diseases with symptoms and suggestions

S.No	Symptoms	Disease	Suggestions
1	Blur and no proper vision	Cataracts	Use Lens
2	Loss of vision and red spots	CMV Retinitis	Injections and intravenous medicines
3	Unsymmetrical eyes	Crossed eyes	Surgery
4	Dryness of eyes	Eyelid twitching	Facial injections
5	Severe eye pain	Glaucoma	Surgery

Table 2. Skin diseases with symptoms and suggestions

S.No	Symptoms	Disease	Suggestions
1	Itching and small spots	Scabies	Permethrin Cream
2	Round red wound	Ring worm	Ring guard ointment
3	Red spots	Acne	Brevoxyl cream
4	Thick and Clustery skin	Actinic Keratosis	Fluorourcil Cream
5	Yellow or White scaly patches	Eczema	Propygenta NF Cream

The hospital details and screenshots to solve various eye and skin problems is given in Figures 2,3 and 4 by chatting with our Medbot.
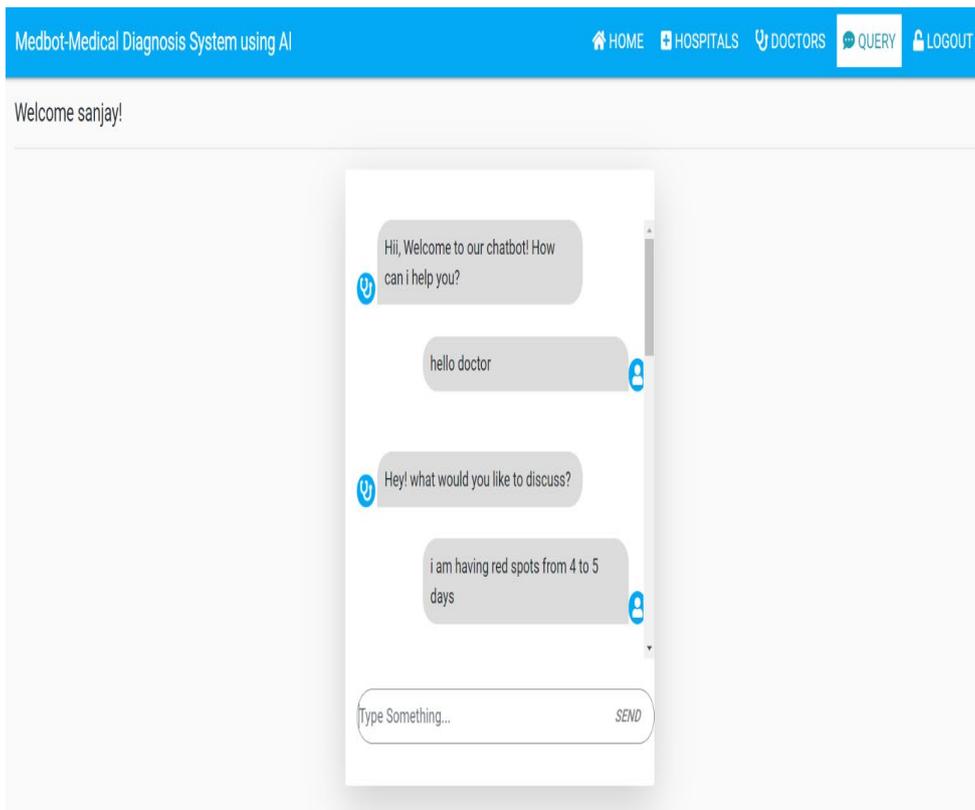
Figure 2. Hospital details in Medbot
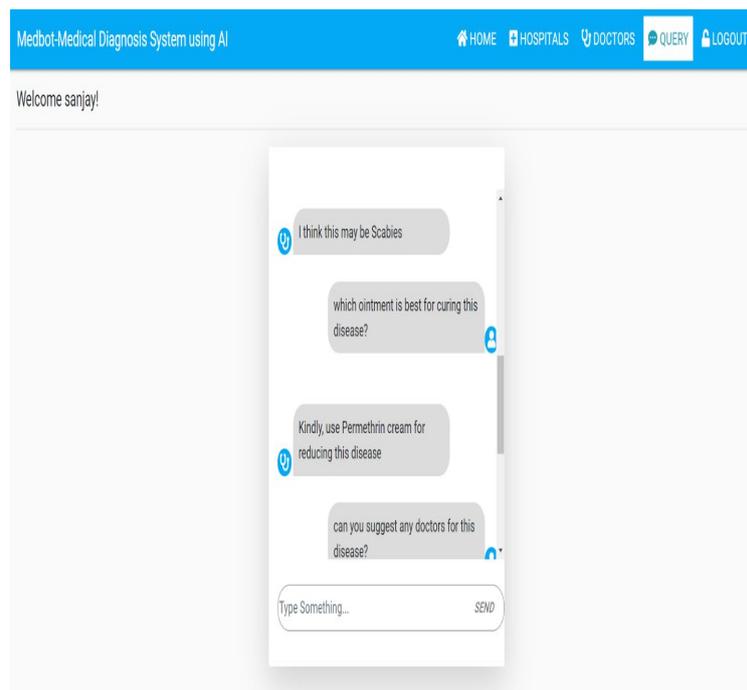

Figure 3. Chatting with Medbot

Figure 4. Chatting with Medbot

5. Conclusion

Precise brain tumor detection is a crucial consideration for physicians to handle. For diagnostic imaging, magnetic resonance imaging (MRI) performs a significant function compared with other imaging methods. Accurate Brain tumor analysis from anMRI image by doctor is dependent on his experience. For this reason, we propose a technique which diagnosis the brain tumor automatically in easy and effective manner. In this paper, we have described a Medbot system that was designed to support patients and health professionals exclusively for eye and skin problems. Patient's perceptions regarding enjoyment and attachment bond with the medbot are also found to be good. In our future work, we will assess additional measures and possible outcomes through our Medbot system.

References

[1] Abbas Saliimi Lokman, Jasni Mohamad Zain Fakuli Sistem Komputer & Kejuruteraan Perisian," Designing a Chatbot for Diabetic Patients", ACM Transactions on Management Information Systems (TMIS), Volume 4, Issue 2, August 2015.

[2] Divya, Indumathi, Ishwarya, Priyasankari, Kalpana Devi, "A Self-Diagnosis Medical Chatbot Using Artificial Intelligence", Journal of Web Development and Web Designing, Volume 3 Issue 1, 2018.

[3] Udendhran R, A Hybrid Approach to Enhance Data Security in Cloud Storage, ICC '17 Proceedings of the Second International Conference on Internet of things and Cloud Computing at Cambridge University, United Kingdom — March 22 - 23, 2017, ISBN: 978-1-4503-4774-7 doi>10.1145/3018

[4] Pohle and K. D. Toennies, "Segmentation of medical images usingadaptive region growing," Proceeding SPIE—Medical Imaging, vol.4322, pp. 1337–1346, 2001.

[5] T. Y. Law and P. A. Heng, "Automated extraction of bronchus from 3DCT images of lung based on genetic algorithm and 3D region growing,"Proceeding SPIE — Medical Imaging, vol. 3979, pp. 906–916, 2000.

[6] W. M. Wells III, W. E. L. Grimson, R. Kikinis, and F. A. Jolesz,"Adaptive segmentation of MRI data," IEEE Transaction MedicalImaging, vol. 15, no. 4, pp. 429–442, Aug. 1996..

[7] Al-Badarneh et al., H.Najadat. and I.Jordan, ``A classifier to detect MRI Brain Images'", The ACM International Conference on Advances in Social Networks Analysis and Minning, pp.784-787, 2013.

[8] Dagar, Preety & Jatain, Aman & Gaur, Deepti. (2015). Medical diagnosis system using fuzzy logic toolbox. 193-197. 10.1109/CCAA.2015.7148370.

[9] Iantovics, Laszlo Barna. (2007). The CMDS medical diagnosis system. Proceedings - 9th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing, SYNASC 2007. 246-253. 10.1109/SYNASC.2007.40.

[10] Heba Mohsen, Abdel-BadeehM.Salem, " Classification using deep learning neural networks for brain tumors" Elsevier, Volume 3, Issue 1, pp.68-71, (2018)

[11] AliIsin, CemDirekogulu, MelikeSah " Review of MRI-based brain tumor image Segmentation using deep learning methods" Elsevier, Procedia Computer Science 102 317-324 (2016)

[12] Mung Chiang, Fellow, IEEE, and Tao Zhang, "Fog and IoT: An Overview of Research Opportunities", IEEE Internet of Things Journal, Vol. 3, No. 6, December 2016.