Use of AI Based "CHATBOTS" for Providing Health Related Information

M.I.Anju[1], T.Saravanan[2], P.Calista Bebe[3], M.Sherly Deva Kirubai[4]

[1,2,4] New Prince Shri Bhavani College of Engineering and Technology, Chennai, India.
[3] New Prince Shri Bhavani Arts and Science College, Chennai, India.

E-mail: anjumi@newprinceshribhavani.com

Abstract

To have a decent existence, medical care is a lot of significant. Be it as it may, if there should be a case with any medical issues, it is difficult to obtain the counsel with the expert. The suggested idea is to use Artificial Intelligence to create a clinical chatbot that can evaluate the illness and provide critical insights about the infection before counselling a specialist. To diminish the medical services costs and improve openness to clinical information the clinical chatbot is constructed. Some chatbots are used as clinical reference books, which enable the patient to find out about their disease and help improve their well-being.The client can accomplish the genuine advantage of a chatbot just when it can analyse all sort of malady and give vital data. A book to-message analysis bot draws in patients in discussion about their clinical issues and gives a customized determination dependent on their manifestations. Henceforth, individuals will have a thought regarding their wellbeing and have the correct assurance.

Keywords: Chatbot, Artificial Intelligence (AI), Optical Character Recognition (OCR), Arduino, Python, Medical Dispenser

1. Introduction

A chatbot (otherwise called a talkbot, chatterbot, Bot, IMbot, intuitive specialist, or Artificial Conversational Entity) is a PC program which directs a discussion by means of hear-able or printed strategies. These projects are intended to give a clone of how a human will talk and accordingly it goes about as a conversational accomplice instead of people. Chatbots utilizes characteristic language preparing for deciphering the client input and producing the comparing reaction yet certain more straightforward frameworks looks for the catchphrase inside the content and afterward gives an answer dependent on the coordinating watchwords or certain example. Today, chatbots are important for remote helpers, for example, Google Assistant, Apple Siri which are gotten to by means of numerous associations' applications, sites, and on texting stages. Chatbots work essentially on Artificial Intelligence, so utilizing this ability we have chosen to add some commitment to the Health Informatics.

Figure 1. Chatbot will connect the Doctor and Patient through web application

Artificial Intelligence takes a shot at the guideline of human insight that can execute assignments from more easy to even intricate. Computerized reasoning gives the preeminent capacity to copy the human perspective and carrying on to a PC. A portion of the exercises in Artificial insight incorporates discourse acknowledgment, learning and arranging. As of late, Artificial Intelligence assumes a significant part in medication and medical care. Man-made reasoning is utilized in the medical services industry for giving medications, treating patients and careful techniques in the activity theatre.

Man-made reasoning projects have been created and applied to practices, for example, physical check-ups, analysis measure, giving medication, persistent observing and care. Moreover, emergency clinics are looking to AI answers for help operational activities that expansion cost sparing, improve quiet fulfilment, and fulfil their workforce needs.

1.1Literature Survey

Here the investigation depends on to perceive side effects, temperature, pressure and different variables of the patient and settling the minor ailments with reasonable prescriptions utilizing AI strategies. This point of the investigation is to kill the view of self-medication and the utilization of medical care talk bots including their advantages, difficulties and significant uses to patients. The arrangements utilizing visit bot which are portraying in this examination are summoned from a portion of the accompanying papers.

a)   "A novel approach for medical assistance using trained chatbot", - Divya Madhu ; C. J. Neeraj Jain IEEE 2017

Here, the AI can foresee the ailments dependent on the indications and give the rundown of accessible medicines. The System can likewise give the piece of the medications and their recommended employments. It causes them to take the right treatment where you can discover your medical issue just by entering manifestations or simply filtering an ECG or you can check whether the recommended medication should be utilized the manner in which you are advised to. At that point it will assist us with deriving the issue and to confirm the arrangement. The proposed thought is to make a framework with man-made reasoning that can meet the necessities. Thus the individuals can have a thought regarding their wellbeing and can have the correct assurance.

b)   "The chatbot feels you - a counseling service using emotional response generation", - Dongkeon Lee;Kyo-Joong Oh IEEE 2017

This paper recommended to present a novel visit bot framework for mental guiding assistance. This framework comprehends substance of discussion dependent on late normal language handling (NLP) techniques with feeling acknowledgment. It faculties enthusiastic move through the persistent perception of discussion. To fabricate different feeling grouping models, various enthusiastic marked information are utilized in this examination and it improved outcome for feeling acknowledgment altogether. Additionally, it produces customized advising reaction from client contribution, to distinguish conversational setting, client feeling and anticipated response. More sensible and ceaseless feeling acknowledgment will improve emotional well-being care analyze. It will be more appropriate clinical mental comfort in moral view too.

c)   "Development of a computer-aided system for automating production of tactile maps and itsusability evaluation", - M. Grossi, M. Lanzoni,   A. Pompei, R. Lazzarini, D. Matteuzzi, and B. Riccò IEEE 2018

In this paper, material illustrations are created. Material designs are only they are pictures that utilization raised surfaces so an outwardly impeded individual can feel them. Material guides are utilized by dazzle and mostly located individuals while exploring around a situation, and they are likewise utilized before a visit for direction purposes. Creating material guides is a significant exertion to carry daze individuals to more self-upheld life. In light of this foundation, we are building up a framework for robotizing creation of material guides from hand-drawn figures.

d) "A Chatbot-supported Smart Wireless Interactive Healthcare System for Weight Control and Health Promotion", - Chin-Yuan Huang ; Ming-Chin Yang IEEE 2018

This visit bot intends to encourage target information gathering and transmission in an ongoing way and the arrangement called "Savvy Wireless Interactive Healthcare System" (SWITCHes). Individuals who are overweight and fat have a more serious danger of creating genuine illnesses and wellbeing conditions. As cell phones have quickly picked up standard ubiquity, portable applications are utilized in general wellbeing as mediation to monitor consumes less calories, action just as weight, which is regarded more precise than depending on client's self-report measure, for weight the board. In light of the client information obtained from SWITCHes application and the helper information from clinical instruments, not just SWITCHes application can draw in client with custom-made criticism in an intelligent manner, as far as man-made brainpower controlled wellbeing chatbot, however the medical services proficient can give the more exact clinical guidance to client too.

e) "EMMA: An Emotion Aware Well-being Chatbot", - Daniel McDuff ; Asma Ghandeharioun IEEE 2019

The framework "EMMA" is called as EMotion Aware mHealth Agent. It is the principal bot to present the idea of ENQUIRY BASED LEARNING that permits clients to express their issues to discover arrangement choices. The talk bot is made for giving genuinely proper miniature exercises in a sympathetic way. The framework can be reached out to identify a client's temperament simply from PDA sensor information. The outcomes show this customized AI model was seen as agreeable through self-reports of feeling from clients. It utilizes progressed intellectual taking in abilities to gain from client discussions and practices to suggest high customized learning.

2. System Architecture

In rustic zones the specialists won't be accessible in the emergency clinic for every minute of every day. This is the serious issue looked in the vast majority of the rustic zone clinics. The answer for this issue is our task (AI based Chabot). This AI based chatbot will give wellbeing related data dependent on the patients' indications. A web application is made utilizing Python Software. With the utilization of the web application the AI based Chatbot will interface the specialist and patient as appeared in Figure 1. The talk bot will be gotten to in country region medical clinics when the specialist isn't accessible. The head nurture in the medical clinic will assist the patients with getting to the Chat Bot. The patients can visit with the chatbot and notice their indications utilizing numerous decision questions. Then the specialist will have the option to see the visit and examine the manifestations. In light of the indications the tablet is given by the specialist through chatbot.

This AI based Chatbot comprises of equipment and programming segments such as:

a)   Arduino Microcontroller

The Arduino Uno is a microcontroller board is used here. It is dependent on the ATmega328 (datasheet). It contains all that expected to help the microcontroller; basically associate it to a PC with a USB link or force it with an AC-to-DC connector or battery to begin. The Arduino Uno can be controlled by means of the USB association or with an outer force gracefully.

b)   Temperature Sensor

The temperature sensor utilized in chatbot is LM35. The LM35 arrangement are exactness coordinated circuit temperature gadgets with a yield voltage directly relative to the Centigrade temperature. The LM35 gadget has a favourable position over direct temperature sensors aligned in Kelvin, as the client isn't needed to take away an enormous steady voltage from the yield to get helpful Centigrade scaling. The LM35 gadget doesn't need any outer adjustment or managing to give regular exactness. Here the temperature sensor will deduct the internal heat level of the Patients. At the point when the patient places his/her finger on the temperature sensor, the internal heat level of the patient is deducted.

c)   Heartbeat Sensor

It is a sensor intended to give computerized yield of heart beat when a finger is set on it. At the point when the heart beat locator is working, the beat LED streaks as one with every heartbeat. This computerized yield can be associated with microcontroller legitimately to quantify the Beats Per Minute (BPM) rate. It deals with the guideline of light adjustment by blood course through finger at each heartbeat. At the point when the patient places his/her finger in the middle of the IR and MOC the beat rate is distinguished and the yield can be taken from the yield pin which is interfaced with the microcontroller.

d)   Audio Power Amplifier

Audio power amplifier will improve the low force electronic sound signs to a level that is sufficiently high for driving amplifiers or earphones. At the point when the Chatbot poses the encircled inquiries, the sound force enhancer will improve the low force sound signs.

e)   LCD Display

Liquid Crystal Display is the innovation that is utilized since decades as level board show innovation. It is an electronically adjusted optical gadget that assists with delivering pictures in shading or monochrome. Here Liquid Crystal Display is utilized showcase the name of the tablet. The tablets recommended by the specialist will be shown in LCD and it will be given to the patient.

f)   Voice Board

The voice board used utilized in our chatbot is ISD1700. ISD1700 voice module is a straightforward and useful circuit board, which can know and ace the ISD1700 arrangement chip rapidly. It additionally has vAlert (Voice Alert) include that can be utilized as another message pointer. With vAlert, the gadget streaks an outside prompted demonstrate that another message is available. The voice board in Chat Bot will play out a few alternatives, for example, "Start Record", "Stop Record", "Eradicate", "Forward" and so on.

g)   Python Software

Python Software is used here. This is essentially on the grounds that Python is outfitted with AIML (Artificial Intelligence Mark-up Language), which makes it incredibly simpler to create sentence structure for complex chatbot highlights. Building AI utilizing Python is tedious and it exceptionally

secluded and intuitive code with high similarity over numerous stages. Utilizing python programming the inquiries are surrounded.

The encircled inquiries will be shown in the web application and different decisions are furnished with partner to it. In light of their side effects the patients will pick any of the numerous decisions. It is more shrewd in understanding the data sources given by the client and it is equipped for reacting in a more explicit, precise and setting based data.

h)   Medical Dispenser

An automatic medical dispenser with a contained pill apportioning system and a storeroom for the majority of pills that can be administered dependent on the client prerequisite. Every one of these frameworks are observed by a focal chip, which is customized to get contribution from the client and control everything the fundamental segments needed to administer the prescription mentioned by the client. The plan depends on straightforwardness and the usages of ease materials and parts that can be effectively accessible. The remedy is readied utilizing a product application that is explicitly intended to get the area of the separate pills in the container with the assistance of a disconnected information base that contains all the medication subtleties accessible in the distributor. The remedy is shown in LCD show containing the measurement and afterward it is being prescribed to the clinical allocator to unlatch the particular wrack according to the solicitation. The clients can get the medications for their medical problems. When the cycle is finished, the unlatching entryway is motioned by the microcontroller to close the clinical distributor.
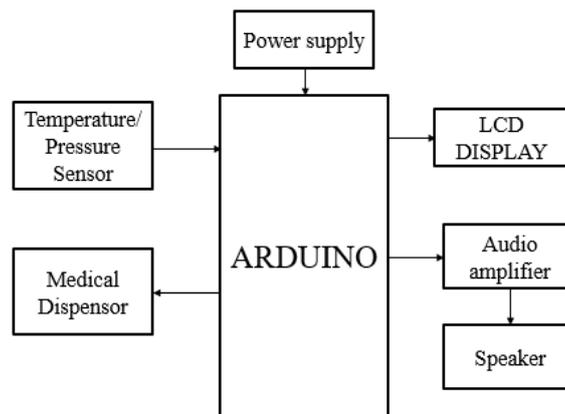

Figure 2. Block diagram of Chatbot

Here, the chatbots complete the task of specialists, one in the medical services community and other with the specialist. The usage of man-made consciousness in emergency clinic where people's lives could be being referred to, even now begins apprehensions in people. A similar inquiry raises when that errand to be allocated to human staff. This medical care chatbot framework will assist emergency clinics with giving medical care backing to day in and day out, it reactions snappy too. At first the patients are given a client name and secret key to get to the chatbot. Physically their name, age and sexual orientation are given as contributions to the chatbot. The patient's internal heat level and heart beat is dictated by the sensors which are attached with the framework. A programmed clinical allocator is

likewise given along the framework. A book to message determination bot takes part in discussion with the patients in regards to their clinical issues.

In light of finding the specialist will recommend the medication to the chatbot which is put in the clinic. The medications will be given to the patients with the assistance of programmed clinical allocator. Medication recommended by the specialist will likewise be shown with the assistance of LCD Display. Here the Arduino microcontroller controls the sensors, clinical gadget, LCD show and the sound force intensifier. Other than the recommended time the specialists can help the patients through this framework.

As appeared in Figure 2 Arduino microcontroller will get to the sensors, clinical container, LCD show and the sound force enhancer. The force flexibly is given to the Arduino microcontroller. The Arduino Uno is a microcontroller board dependent on the ATmega328. When the temperature and weight is noted down it is sent to the chatbot with the assistance of this Arduino. Arduino helps the chatbot in speaking with the assistance of sound force enhancer and speaker by changing the voice. When the medication is recommended it will be shown in the LCD with the assistance of the Arduino. Arduino likewise controls the clinical gadget and gives the necessary medication.

IV. RESULT & ANALYSIS

As appeared in Figure 3 the information base of the patients are put away in DB Browser. Here the client name and secret word can for the patients to get to the chatbot.

Figure 3. Database of the Patients are stored in the above application


```
# -*- coding: utf-8 -*-

from flask import Flask, render_template, request, session
import sqlite3
import aiml
from seminar2_progress import sntnce as s
import random
import re
from mappings import map_keys
import os
AUTH_KEYWORDS = ['login', 'appoint', 'cold', 'info','status']
app = Flask(__name__)
app.secret_key = os.urandom(24)

botName = "P8-Bot"

@app.route("/")
def home():
        global botName
        session['sid'] = random.randint(1,10000) #uuid.uuid4()
        k.learn("std-startup.xml")
        k.respond("load aiml b", session.get('sid'))
        botName = k.getBotPredicate("name")
        k.setPredicate('email', '', session.get('sid'))

        return render_template("index.html")

@app.route("/get")
def get_bot_response():
        userText = request.args.get('msg')
        return (start(userText))


sent_check = s.Sent_Similarity()

k = aiml.Kernel()
#k.learn("std-startup.xml")
#k.respond("load aiml b")
#botName = k.getBotPredicate("name")
```

Figure 4. Python Program for framing the questions in Chatbot

Figure 5. The link for the web application will be generated by the Python software
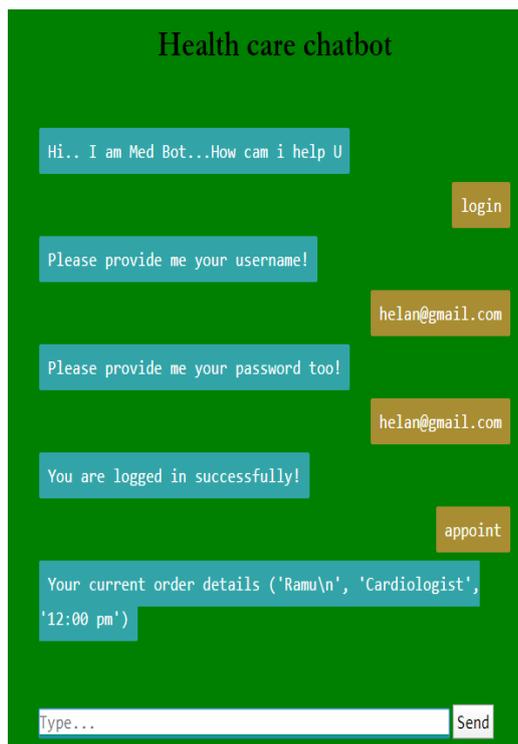

Figure 6. Text to text diagnosis bot engages in conversation with the patients regarding their medical issues

V.   CONCLUSION

From the survey of different diaries, it is inferred that, the utilization of Chatbot is easy to understand and can be utilized by any individual who realizes how to type in their own language in versatile application or work area variant. A clinical chatbot gives customized analyse dependent on side effects. Later on, the bot's side effect acknowledgment and finding execution could be significantly improved by including support for more clinical highlights, for example, area, length, and power of indications, and more definite manifestation depiction. The execution of Personalized Medical right hand vigorously depends on AI calculations just as the preparation information. Finally, the usage of customized medication would effectively spare numerous lives and make a clinical mindfulness among the individuals. As said previously, the future period is the time of informing application since individuals going to invest more energy in informing application than some other applications. In this way clinical chatbot has wide and immense future degree. Regardless of how far individuals are, they can have this clinical discussion. The main necessity they need is a basic work area or cell phone with web association. The proficient of the chatbot can be improved by including more blend of words and expanding the utilization of information base so that of the clinical chatbot could deal with all kind of maladies. Indeed, even voice discussion can be included the framework to make it all the more simple to utilize.

References

[1] SimonHoermann, Kathryn L McCabe, David N Milne, Rafael A Calvo1, *"Application of Synchronous Text Based Dialogue Systems in Mental Health Interventions: Systematic Review"*, Journal of Medical Internet Research, volume: 19, issue 8, August 2017.

[2] Saurav Kumar Mishra, DhirendraBharti, Nidhi Mishra, *"Dr.Vdoc: A Medical Chatbot that Acts as aVirtual Doctor",* Journal of Medical Science and Technology, Volume: 6, Issue 3, 2017.

[3] DivyaMadhu,Neeraj Jain C. J, ElmySebastain, ShinoyShaji, AnandhuAjayakumar, *"A Novel Approach for Medical Assistance Using Trained Chatbot"*, International Conference on Inventive Communication and Computational Technologies(ICICCT 2017).

[4] HameedullahKazi,B.S. Chowdhry,ZeeshaMemon, *"MedChatBot: An UMLS based Chatbot for Medical Students",* International Journal of Computer Applications (0975 – 8887)Volume 55– No.17, October 2016.

[5] DoinaDrăgulescu,AdrianaAlbu*,"Medical Predictions System",* International Journal of Engineering Research and Applications , ISSN: 2248-9622 ,Vol. 2, Issue 3 , pp.1988- 1996, May-Jun 2015.

[6] Abbas SaliimiLokman, JasniMohamadZain,FakultiSistemKom puter, KejuruteraanPerisian," *Designing a Chatbot for Diabetic Patients*", ACM Transactions on management Information Systems (TMIS), Volume 4, Issue 2, August 2015.

[7] PavlidouMeropi,Antonis S. Billis,Nicolas D. Hasanagas,CharalambosBratsas,IoannisAntoniou,Panagiotis D. Bamidis*,"Conditional Entropy Based Retrieval Model in Patient-Carer Conversational Cases*",2017 IEEE 30th International conference on Computer-Based Medical System. 7 Page 1-7 © MAT Journals 2018. All Rights Reserved Journal of Web Development and Web Designing Volume 3 Issue

[8]BenildaEleonor V. Comendador, Bien Michael B. Francisco, Jefferson S. Medenilla, Sharleen Mae T. Nacion, and Timothy Bryle E. Serac, *"Pharmabot: A Pediatric Generic Medicine Consultant Chatbot "*, Journal of Automation and Control Engineering Vol. 3, No. 2, April 2015.

[9]Gillian Cameron, David Cameron, Gavin Megaw, Raymond Bond,Maurice Mulvenna, Siobhan O'Neill, Cherie Armour, Michael McTear*,"Towards a chatbot for digital counselling"*, Journal of Medical Internet Research, 4(1), pp. e3

[10]   A.M. Barani, R.Latha, R.Manikandan, "Implementation of Artificial Fish Swarm Optimization for Cardiovascular Heart Disease" International Journal of Recent Technology and Engineering (IJRTE), Vol. 08, No. 4S5, 134-136, 2019.

[11]   Manikandan, R., Latha, R., & Ambethraj, C. (1). An Analysis of Map Matching Algorithm for Recent Intelligent Transport System. Asian Journal of Applied Sciences, 5(1). Retrieved from https://www.ajouronline.com/index.php/AJAS/article/view/4642

[12]   R. Sathish, R. Manikandan, S. Silvia Priscila, B. V. Sara and R. Mahaveerakannan, "A Report on the Impact of Information Technology and Social Media on Covid–19," 2020 3rd International Conference on Intelligent Sustainable Systems (ICISS), Thoothukudi, India, 2020, pp. 224-230, doi: 10.1109/ICISS49785.2020.9316046.