

## A Review of AI Based Medical Assistant Chatbot

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### ABSTRACT

*This is now the age of smart computer. Machines have started to impersonate as human, with the advent of artificial intelligence, machine learning, and deep learning. Chatbot is classified as conversational software agents enabled by natural language processing, and is an excellent example of such system. A Chatbot is a program which allows the user to start a conversation with the machine. This is a platform focused on Artificial Intelligence (AI), which can be developed as messaging applications, web applications, or smartphone applications. A chatbot represents machine that answers questions using Natural Language Processing (NLP). Formulating natural language answers to the questions. Chatbots create a difference in the world of nursing and provide a simple way to handle people from professional organizations. Health chatbots are capable of running one-on-one patient communications and of reviewing specific patient queries. This program aims to investigate the existing healthcare structure involving a complex interaction with human machines and proposes an alternate method: a chat interface designed and configured to act and interact with patients like a human being.*

**Keywords:-**Artificial intelligence, deep learning, chatbot, natural language processing.

### INTRODUCTION

Artificial intelligence is machinery which simulates human intelligence processes, in particular computer systems. These mechanisms include understanding (acquiring information and guidelines to use information), logic using laws to arrive at possible or definitive assumptions, and self-correction. Artificial intelligence is currently at its height, so chatbots are only one illustration of how their application will improve.

The key aim of the program is to address the language divide between consumer and health care professionals by delivering direct answers to customer inquiries. People today are more likely to be hooked to the internet but are not worried with

their personal wellbeing. We're not going to hospital for a mild illness which might become a big disorder in the future. Instead of searching through the web-based set of theoretically relevant text, it is easy to create question response forums to discuss those queries. For starters, some of the current programs have some drawbacks; there is no clear remedy for the patients who have to wait a long time for expert acknowledgement. Many of the systems will charge the price to do online live chat or phone doctor contact.

Chatbots or virtual assistants were developed to facilitate computer-human contact, and reached the marketplace. A Chatbot is a program that uses artificial intelligence (AI) capable of conversing (or

chatting) with a user in a natural language from, or over the internet, virtual chat rooms, forums, tablets, and messaging applications. Chatbots are also referred to as one of the most interesting and complex ways in which humans and machines interact. This program allows use of natural language processing (NLP) to allow contact between people and computers. There are three analyzes that find the natural language, i.e. finishing the definition of the key linguistic relationships to turn subject into object of the sentences. After that the text of the definition stops. Semantic work makes use of words indicating information Chatbot is an object that imitates human contact through techniques such as the Natural Language Processing (NLP) along with a text or voice language in its officially approved configuration. This software has the goal of replicating an human debate. Chatbot platform can be developed by developing a user interface to submit feedback and receive reaction.

The app communicates with the user by keeping track of the interaction status and by recollecting the previous commands to include functionality. Artificial algorithms can be used to build medical chatbots which scrutinize and classify user questions and provide answers to specific questions. A broad illness may begin with small problems like headache that sound regular, but can continue with significant diseases including brain tumor. Most of the disease will be recognized by the signs, indicating that if the patient's anatomy is carefully observed the illness can be detected. The software gives explanation while utilizing a dynamic Graphical User Interface that communicates to the actual human being as the user is talking. Chatbot that can be used in a number of fields such as education, child care and roadside assistance.

The chatbot's principal benefit is to have

feedback and know-how for a safe life. A text-to-text appointment bot addresses patients with their medical issues in a chat and offers a customized recommendation centered on the symptoms. People will then have an understanding of their health and provide the correct safeguards. As human-computer interfaces the chatbots play a key role. It's a software that simulates typed speech with the purpose of luring the consumer to believe they're talking to another person for a short period.

### **EASE OF USE**

#### **Develop an Immersive, Quick Real-Chat Network**

The norm in connectivity today is smartphone communications. The specialty of such interactions is the style of contact, they are rather quick and time-saving. And if Chatbot follows all of the functionality of an instant messaging system, it can be very efficient. Chatbots are typically text-driven, with icons and cohesive widgets that render communicating with a bot quick to start. Just ask of the messaging device you're using – it's as easy as it can be and that's exactly why we're so loving these devices. The price is important, so don't have cool but wasteful devices bothering the clients. Simplicity is also what has made our hearts won over by the most popular labels. Such issues are at the core of a definition of Chatbot which is why they are doomed to success. There are generally two types of Chatbots-unintelligent ones that work with predefined human-written dialog flows and smart AI chatbots using machine learning. Any of our other blog articles on those two will give you more in-depth analysis. Nevertheless, it will be more personal and individual than your usual device, no matter what sort of bot you create. You can fill it with your theme, the voice of your company, make it speak to your customers as you want, change the message according to customer feedback.

Moreover, we are inclined to ascribe human attributes to inanimate things; the most significant role of our imagination is to personify abstract notions. You will fill it with your theme, the voice of your business, make it talk to your customers like you do, adjust the message according to the customer's comments. Moreover, we are inclined to ascribe individual attributes for in animating things; the most significant role of our imagination is to personify abstract notions. There's one distinction between an AI and a human being, though. A Chatbot is selfless and dedicated to you and you still have time and resources. And this about this growth is even more noteworthy.

#### **Dosage of Age Associated Drugs**

Not all can consume the same amount of drugs; the ingestion of dosages is usually classified according to the age and weight of the person taking the medication. The Chatbot is then programmed to define medication as a dosage of medication based on the recipient's age.

#### **Dedicated Device that can Answer All the Medication Queries**

In medicine touch and details the latest areas in medicine classification are really bad and weird. As no illness is really strong in nature, so is medication no. Numerous undertakings include such. Within the package the designers get their own branding. Consequently, each one of them is different in one way or another. So, there's no way to test each medication's structure or use. The program should identify the drug that offers name and deception service. The chemical structure, the dose for increasing age group, medication uses, side effects etc. will be provided. Users would pretty much pose every medical question. The patients will then check the recommendations of the practitioner, to be confident about the recommended drug.

#### **So Built that it can Operate in Cross-Applications**

The network services should be made available to the highest amount of people practicable. It also requires to be able to operate in various networks, across both PCs and mobile platforms. The framework is designed to operate across all systems including iOS, Windows and Android. When the benefit grows so will the number of individuals we would be supporting.

#### **Efficient Diagnosis of Illness Basing on Symptoms.**

Each disease has a signature thereon. We start off as minor things, then then something serious then life-threatening. The illnesses begin as signs such as headache or back pain that should seem normal. And, they're probably going to develop things like cancer. For every illness, instead, there is an increasing rise. One can quickly recognize the most common illnesses when the signs are examined. Symptoms may involve discomfort, bruise, etc. Catching and evaluating the signs will help predict the potential health risks, if any. When a person's body is regularly examined, any potential issues will be identified well before they begin to do any damage to the individual.

#### **Is Easy to Incorporate and Update**

The machine is built in. That is, it has to have multiple modules mounted on it. Each module has the capabilities to accomplish a mission. The modules would have to be usable and upgradable individually. There are many services available in the programme. Some are very sophisticated. As time goes by each module may then be modified. The computer therefore needs to build so that each element has to be upgradable individually. The computer needs to be better able to work per board. This makes quick enhancement of the device. As the system progresses, so will the capabilities

of the system. More and more disorders can be predicted, as can more medicines. One of those system capabilities suggested is to recognize the health state of a human being by reading a pulse or an electrocardiogram (ECG). And it can send a timely boost to our health. And offer us forecasts on future diseases, even before they begin to form.

### **RELATED WORK**

**Endurance: A guide for dementia patients:** Often dementia sufferers maintain most of their capacity to converse as their illness advances. Nevertheless, the guilt and anger felt by many dementia sufferers also allows frequent, uncomfortable day-to-day interactions with members of even immediate relatives. This is why Endurance, a Russian development firm, has developed its chat bot as a companion. A lot of individuals with Alzheimer's disorder are dealing with memory failure on short notice. As such, the chatbot tries to detect anomalies in conversational divisions which may signify an impending memory problem – a rather challenging technological task for an NLP-based framework. However, as the chatbot is a cloud-based program, doctors and members of the family may search the interaction logs collected from the bot to detect potential loss of memory capacity and connectivity problems that might indicate a decline in the state of the individual. Interestingly, the as-yet unnamed conversational agent is currently an open-source system, implying anybody may help build the codebase for the bot. Science is still in the early stages so it has tremendous ability to educate patients, clinicians and rehabilitation specialists understand about how the brain is impacted by Alzheimer's disease. A Russian version of the bot is already usable, and this year is expected to see an English version at some point.

**Casper: Helping Insomniacs Get through the Night:** If you struggle with insomnia, you'll realize that one of the worst facets to being unable to sleep is the sense of almost suffocating loneliness – the sensation when everybody else in the universe rests peacefully while your own subconscious is betraying you with anxieties and suspicions. Join the aptly named Casper's Insomnobot 3000 (which is probably one of the most tongue-in-cheek, retro-futuristic titles for a chatbot I've ever met), a conversational agent whose role is to give someone insomniac to speak to when it's not convenient to speak to the rest of the world. Insomnobot 3000 is a bit of a primitive at this stage. The reactions that the agent gave are not absolutely right. Though I'm not sure if talking to a bot would help me sleep until at least 4 a.m. It will stop me from scrolling into My Twitter Account's never-ending nightmares.

**UNICEF: Helping Marginalized People Be Heard:** Before now, with the exception of Stamina's dementia companion app, the chatbots we've been watching were largely nothing but enjoyable stuff. However, UNICEF is using multinational non-profit child development chatbots to help people living in developing nations communicate with the most urgent needs of their families. The bot, called U-Report, focuses on gathering large-scale data which polls- this is not a talkative bot. U-Report regularly sends planned polls on a range of urgent social problems, and users (known as "UReporters") will answer with their comments. UNICEF is still making use of the feedback as the basis for future policy decisions. U-Report sent users in Liberia a survey about how teachers pressured students into sex in exchange for better grades in one especially startling illustration of how this very tiny bot had a huge impact. Approximately 86 per cent of the 13,000 Liberian children interviewed by U-Report responded that their teachers



were involved in this shameful practice, culminating in a collaborative effort between UNICEF and Liberia's Ministry of Education to stop it.

**Med What: Make Medical Treatments Faster:** If you're the sort of person who has bookmarked WebMD, you may want to check out Med What. This chatbot aims to make medical treatment for both patients and physicians easier, clearer and more available—think of it as an informative version of WebMD that you can speak to. MedWhat is powered by a complex machine learning system that offers ever more detailed responses to user questions based on habits that it "learns" through human speech. Besides MedWhat's ever-increasing collection of medical concerns, the bot also relies on vast volumes of medical literature and peer-reviewed research journals to extend its already comprehensive medical expertise. In some instances, MedWhat is more like a personal agent (like Google Now) rather than a conversational handler, this also reflects an interesting chatbot development field that integrates smart NLP systems with machine learning technologies to provide reliable and responsive interaction to consumers.

**ALICE: The spawning Thousand Bot ...Other Bots:** There would be no list of groundbreaking Chatbots complete without ALICE, one of the very first bots to go online—and one that holds up remarkably well despite being created and released over 20 years ago. ALICE – the Fictitious Textual Internet Code Object, a word that may have been taken straight from an episode of The XFiles – was created and introduced by the founder Dr. Richard Wallace back in the dark days of the early Internet in 1995. Although ALICE relies on such an old codebase, the bot provides users with an outstandingly stable conversational experience. Of course, no bot is healthy, particularly one

that's old enough to drink legally in the U.S. if it has only a physical shape. Like most contemporary bots, ALICE tackles the complexities of certain queries and returns a mixture of unconsciously postmodern responses and remarks indicating that ALICE has a greater self-awareness that we can offer credit to the agent for. Despite Dr Wallace's pioneering research, none of today's chatbots should have been realistic for all its disadvantages. For Spike Jonze's 2013 science fiction romance movie, *Her*, Wallace's bot also acted as the basis for the companion operating system.

A Chatbot offers a solution in the form of a chat app to the healthcare industry and can transform the way patients interact with physicians or other healthcare organisation. Based on the signs, the AI can diagnose the illnesses and include a selection of possible remedies, or include the appropriate contact details for consulting with the doctor. The device may also provide the composition of the medications and their prescribed uses. [1] Patients are given a quicker response to their health-related problems and are able to respond quickly in urgent circumstances. This will perform certain things on behalf of the user, thereby smothering the relationship. The user will only gain the true benefit of a chatbot if he can recognise all kinds of illnesses and have the details required. The program uses pattern matching algorithms to process all the users' details it receives and provides an appropriate and fast response[2][3]. Another approach to build an intelligent device is by introduction of speech recognition where a simplified form of speech processing is introduced; both messages are written in an extensible markup language (XML). This service provides an interface allowing for XML processing.

The chatbot consists of the core and GUI

which accesses the core in relational database management systems. The data is processed in a knowledge server and the data is collected based on pattern matching algorithm once the consumer asks the chatbot software for a question. [4][5] The issue with which a patient has an intimate relationship with his or her physician is that it usually takes place in an 8-10-minute session which is not very satisfying. Using AI and machine learning algorithms, chatbots are supposed to reduce healthcare expenses when used in lieu of a human, or to support them as a first phase in helping to identify a disease and providing self-care advice [6].

A chat bot (also known as the talk drone, bot, chatterbox, automated conversational entity) is a computer program for audible or textual communication. These programs also aim to simulate convincingly how a person will act as a conversational partner and therefore pass the Turing test. [7,17,18]. Dr Sbaitso was created in 1991 for MS DOS Personal Computers as an AI speech synthesis system. In this research, Dr Sbaitso was a counselor of so little chance. Four years later, A.L.I.C.E (Artificial Linguistic Internet Code Entity) contained 40,000 information fields, subsequently awarded a three-time Loebner Award. In 2001, SmarterChild was made available as a bot transmitted via SMS networks, and is now considered a successor to Apple's Siri launched on iPhones in 2010. [8] ChatBots delivers virtual, personal assistants much more than simple messaging applications. They can be controlled by speech, which also enables them to be used while the hands are full. They come in handy to play music, order meals or take notes. The latest software is a virtual chat assistant that is able to answer health-related questions empathetically, based on a physician-patient communication model. Not only is the recommended assistant informative but also provides a positive

user experience.[9] Patients 'requests are all critical questions, but they do not usually require a physician's response. Google searches to get the correct answers are often difficult to achieve, since most users don't know how to determine the quality of the information they find online. And the Internet is full of fake news and blogs that are deceptive and trying to market things.

ChatBots allow the patient to communicate with the health-care organization through their preference platform. The health-care sector generates a large number of data. It is preserved in a confounding series of different structures, programs, and data silos. With the help of ChatBots this information can be accessed safely. Therefore, helping to facilitate communications that were previously not possible.

The chat-bots are primarily used to have both human and computer conversations. Admin feeds some information into the system so that the computer can define the sentences and take a decision as an answer to a query itself. Such as Question Answering (QA) systems[10] which attempt to respond to natural language queries[10,11] by providing answers rather than simply listing the links to documents. The aim of the QA system is to provide valuable data on the things of interest that support customers with a pattern matching technology to accomplish what they explicitly need[18]. Artificial Intelligent Markup Language[13] is used as a teaching model and Microsoft speech synthesizer used to describe the user's spoken word to create the chatbot in[11] Chatbots can also be used to diagnose the symptom-based disorder and prescribe a list of possible treatments for the expected illness. [12] The contrast of various Web-based networking systems is discussed in [14] text-based synchronous chat. In addition, one-on-one therapy which uses

text-based synchronous talk is also used in mental health.

The concept of developing a healthcare chatbot for Artificial Intelligence[15] that analyzes the disease and offers specific facts about the illness before seeking recommendations from a doctor that can minimize healthcare costs and making patient knowledge more convenient. Many chatbots act as a medical guide book helping the user to know more about their illness and improve their health.

The paper [16] contains the method that will help to assess the health condition by merely entering the signs or testing an ECG. It will allow the user to deduce the question and they will test the solution. It provides the prescribed uses and the medicinal composition. It helps them to take the proper care with the analysis along with the artificial intelligence.

Godson Michael D'silva et al.[17] proposes a system that analyzes the communications from each recipient in order to check if they are actionable or not. When it is actionable then an automated Chatbot will start the dialogue with that user and encourage the user to determine the issue by providing human experience through LUIS and cognitive tools. The system is implemented into AWS Public Cloud.

BayuSetiaji et al.[18] used bigram for the estimation of the similarity of sentences to make a final choice as the answer to the question by matching the user input sentence, i.e. pattern matching requirement[10]. The bigram divides the input sentence as two characters, in order to more easily find the context of the sentences.

The paper[19] gives a chatbot device that performs on diabetic patients as a virtual diabetes doctor to perform a simple

diagnosis. The chatbot can use the parameter called Vpath to recall previous conversation path. Vpath addresses the question that corresponds with the whole discussion, as it was intended specifically for a virtual diabetes doctor.

Paper [20] describes a pharmabot used to administer and provide information for children utilizing the Left and Right Sorting Algorithms on the effects of general drugs. The author has created a web-based application which allows access to and use by anyone.

Paper [21] gives an example of a sample chatbot used in mental health counseling. The approach that provides a more concise technique to direct the customer to the PDF worksheets and ask them what knowledge areas they want to collect. The software that was used to add Emoji. User will create a more engaging and user focused interface by integrating mental wellbeing evaluation tools into a chatbot device. It offers 60 per cent accuracy.

The paper provides the approach of understanding the truth in texts and providing the past substance to establish a dialogue that is used in CSCL scenarios in middle school. The program takes a plain text, as input and output is a trained user who can answer all sorts of questions. The goal is to give this problem a generic solution[22].

The Deep Neural Hybrid Network (DNN) and the Hidden Markova Model (HMM) can be used to improve performance in speech recognition. The DNN technique is more effective and efficient than any other approaches used to understand speech. The traditional neural networks (CNN) are used in speech recognition in such a way that the structure of CNN specifically accommodates some forms of voice variance CNN decreases the error bit by 6 percent to 10 percent, thus enhancing

speech recognition [23].

## **LITERATURE SURVEY**

### **Chatbot Utilization for Medical Consultant System Implementation:**

Four stages of MedBot integration research, which includes system analysis, system design, development, and process testing.

#### ***Device Analysis***

First, DoctorMe was thoroughly studied to find out regarding potential diseases, medications and herbs that could be used to alleviate the symptoms. The 16 signs were reported including nausea, fatigue, vomiting, headache, conjunctivitis, sore throat, feeling dizzy, skin rash, knee pain, diarrhea, dark-colored sweat, dengue, migraine, stuffy, catarrh and stomach ache. In the later step the information is used to train the chatbot. Nonetheless, we have also identified other limitations from this analysis that may impact users while utilizing the software, including

1. Device deployment is needed,
2. Device instruction adaptation is necessary,
3. Application compliance for tablets and smartphones only.
4. Chatbot will remove certain restrictions. Users no need to update to the latest version and learn it. We are going to use the IM system, which we still have and where they are using.

#### ***Chatbot Design***

MedBot is built to serve as a nurse, diagnosis and treatment authority. She'll send patients the recommendation and send them medical advice. The object of the chatbot is merely to provide general symptoms to the consultation. In addition to these, the chatbot will start treating the patients like an actual doctor. MedBot has 34 attempts including 16 discomfort attempts, ten sub-detail stomachache attempts, five sub-detail headache attempts, one chatbot salutation attempt,

one no-illness attempt and one attempt to find a doctor by contact. MedBot provides a recommendation about such efforts that the patient treat the doctor for some slight symptoms. The chatbot was trained for these intents.

#### ***Development***

The key method used by Google for developing MedBot was the Dialogflow. The moves for this activity are below.

1. Create an Agent (MedBot) in Dialogflow using Google Account.
2. In DoctorMe, prepare the use of health details to generate aim.
3. Sentences and replies to commands are intentional apps.

Build the sentences for the lesson to match the student's language. Define user feedback which may include phrases, images, voice and video. JavaScript or JSON format is used to store images, video, and audio. The words learned in the training cycle are derived from signals and warning indicators of DoctorMe's implementation.

#### ***Testing:***

The final step of the development process is the testing. There are 2 evaluation stages, i.e. during the preparation evaluation and the system test. Training is to test the contact expression of a device through testing, and to search for the response. If the response isn't right, more training phrases are required. This approach can be extended to the chatbot in a programming tool. The system checking is conducted upon completion of program implementation. Simulation of the conversion is installed and tested

#### ***Issues***

The model is created using unintelligent chatbot, meaning that if the newly occurring instance is present in that dataset, the model is trained on a similar dataset, then only it can produce the output.



**Application of synchronous text-based dialogue system in mental health interventions****Implementation:**

Data Sources and Search Strategy: The search approach contained a mixture of mental health and code jargon, with keywords related to the form of intervention (e.g. conversation, talk, email, with messaging), intervention, and consequences (e.g., counselling, commitment, effectiveness, disposition, quality of life, and mental wellness). The Scientific Literature Research and Retrieval System Online (MEDLINE) tentative searches offered a weak test match, and identified just a limited number of articles. Subsequently, the search technique was revamped and concepts were expanded to encompass a broader variety of mental wellbeing problems to increase the amount of studies completed. Keywords from different outlets including medical research, forums on mental wellbeing, and the Fifth Edition of the Psychiatric Illnesses Diagnosis and Statistical Manual (DSM 5) were gathered. Search words also included conditions linked to mental wellbeing and well-being, such as intimidation or cyberbullying, harassment, crime and stigma. The main emphasis was on the therapeutic consequences of synchronous text-based intervention, though occasional reference was made of any technical concept, caregiver or patient intervention evaluations.

Selection criteria: Tests were omitted since the research could not depend solely on synchronous text-based communications, such as if the main contact method (e.g., phone) or face-to-face engagement (e.g., video chat and in-person counselling session) was discussed. Test was also ruled out because the approach was not one-on-one, or mutual contact (for example, a psychologist attends a chat room or community meeting). In comparison, tests

where the study results did not involve emotional well-being and well-being were excluded; and where studies were confined to physical patterns (e.g. weight loss, reduction of cholesterol, and support for exercise). Work was often excluded in cases where less than 5 participants were registered or used as unidirectional (i.e., only one person sent messages) or non-synchronous (i.e., email) communication.

**Issues**

The question of whether these technologies are cost efficient in clinical practice remains a issue of future research studies.

**Medchatbot: An UMLS based chatbot for medical students Implementation:**

A user survey was carried out to determine potential questions that would be asked to a chatbot by users. The survey was given to University of Israel medical students. A total of 97 samples of the questions were obtained and then divided into groups based on the form of question. The resulting categories were classified within each category according to the number of questions asked. Many questions were focused on what is query, which constitutes 47 percent of the questions asked. The remaining groups included each of the total questions in less than 7 per cent. And along with three other groups we agreed to incorporate this group of questions in the chatbot. The other three types are also applied as they could be addressed by leveraging the information structure in UMLS, which is the form of, what are the causes of and what are the symptoms of. Consequently, the AIML templates are encoded to support four kinds of queries: what is, what is the form, what are the causes and what are the symptoms. The chatbot had been designed to help the most the queries listed above by encoding the relevant AIML templates. The answers to what is a query are supplied by extracting the textual

definition of the specific word found in UMLS. The questioning of what is heart attack, for example, leads to the answer: to what form of query is given by retrieving the semantic form of the term in UMLS. By using a method defined by Liu & Chu, responses to what are the causes and what are the symptoms of are produced through information extraction.

### **Issues**

The program was not developed explicitly to support the normal dialog in chatbots.

### **Medical predictions system**

#### ***Implementation***

The specification has a complex structure, reviewing details related to the initiation of the hepatitis infection, its origin, the antecedents, the signs, the laboratory test results, and the production of other basic biological indicators during treatment. It builds a multifunctional database and incorporates an expert framework that is used to diagnose various forms of hepatitis, and to realize certain assumptions about the patient's development and treatment response. The system uses two main components (an inference machine and neural network architecture) which operate on the multifunctional database. It has an interdisciplinary character and fulfills the criteria of a framework used in prediction and medical diagnosis.

Firstly, the program provides the possibility of diagnosing the most common forms of hepatitis: B, B+D and C. For this reason logical inference is used. The effect can be seen on one of the interfaces for applications. The consumer will set the marker values that will decide which type of hepatitis is. Before that, the result is shown on the bases of the rules mentioned in section II.

### **Issues**

Won't be able to substitute the main

decision-making element.

### **Designing a Chatbot for diabetics patients**

#### ***Implementation***

Diabetes disease cannot yet be cured by medical stature nowadays, but it can be managed properly so that patients have a healthy, active life. Monitoring (blood glucose level), healthy diet (following nutritional advice) and encouragement of patients / guardians (to encourage diabetics to have the ability to control their illness) are three main components of diabetes management. The first aspect where patients need to monitor their blood glucose level on an ongoing basis is typically achieved by close monitoring of an early symptom of low blood glucose levels. Nevertheless, these signs are undetectable if the patient is unaware of their disease. Thereafter, patients need to go to the hospital regularly to receive a test report on these symptoms even though they are in a stable degree of control of their disease. As such, we are proposing to create a chatbot that will act as a virtual diabetes doctor to make a simple diagnosis on patients with diabetics.

The process flow is that the patient will have a daily talking session using natural chatbot language, which will be asked (ask by chatbot) and replied (input by patient). The session will continue until the patient is diagnosed successfully, and then they can receive their most effective treatment recommendations for their diabetes condition. Chatbot will ask multiple sequence questions to explain the condition and those questions will be chosen based on the patient's answers. This means chatbot need to learn the entire flow of the conversation.

### **Issues**

Keep repeating the previous query until it identifies the keywords.

## **Conditional Entropy Based Retrieval Model in Patient-Career Conversational Cases**

### ***Implementation***

Retrieval of the Suitable Answer in Assistant Bot-Patient Interaction: Three dialogs in the three separate emotions, Confidence, Sentiment and Instrumental Capability were the evidence we used for the first experiment. The dialogs is focused on an examination of the sensor results from the Clinical Skills Laboratory at Aristotle University of Thessaloniki at the Medical School, and also focused on the respective recommendations for of sensor-identified medical symptom. More precisely, the sensors identified and registered the signs correlated with depression.

If we will see, in the first assistant, the assistant approaches and advises the patient about the condition detected by the sensors, and the patient talks to the assistant about this condition. Based on the two previous words, which are the symptom-related problem and the patient's interest, the Assistant gives a fair decision in the second Assistant-Patient encounter. Psychologists edit and transform the thoughts and concerns content into clear dialogues. After the specific phrases for increasing position in the patient-assistant partnership were made, the initial analyses made three distinct differences in attitude. The assistant questions and supports in the first illustration of a strategy that respects as well as the patients to communicate their concern in a way that is transparent and equal, which leads to the degree of assistant confidence. The patient talks deeply and sentimentally in the second edition and the Bot Assistant often presents his suggestions in a Romantic manner. Finally, in the last scenario, the patient speaks in such a way as to deny the orders and treatment provided by his / her doctor, and may even display self-destructive behavior. This is the situation

where the assistant's advice is performed in a way that involves a close interaction with the persuasive power that may be utilized to enable the individual identify the threats as soon as practicable in order to comply with the orders of the specialist. After the three attitude variations are made, our network of interconnected words is established. It tracks all of the terms that were used in the three documents. They wipe the duplicates out. In the adjacency matrix, the words that happen to be in the same language, as well as the language of the relationship, symptom+complaint-suggestion, are symmetrically linked to each of the three attitudes, Confidence, Sense and Instrumental Strength.

In this way, other phrases, meaning knowledge, are processed in the same sentence with respect to others. Additionally, the communicating terms, symptom+complaint-suggestion in each pair, semantically link the terms, and store information about the nature of the sentence in the adjacency matrix.

### **Issues**

The problem here is that a compact Adjacency Matrix is necessary based on the dialogs.

## **Chatbot: A Virtual Medical Assistant**

### ***Implementation***

The system proposed is a web application which includes a chatbot. In this model we are using the 'Dialog flow' API, there are many bot creation frameworks including Microsoft Bot Framework, Facebook bot Engine, API.ai etc. Constructed with Google's Dialog Flow, the chatbot is smart personal assistants. It summarizes the Natural Language Processing, Machine Learning and other deeper concepts and offers a clean functional user interface for focusing on the conversation flow and creating bots.

How Float the Dialogue?

1) Built-in natural-language processing (NLP) function provides the chatbot with artificial intelligence (AI), allowing the chatbot to process the natural language and move the conversation forward naturally.

2) Machine learning makes dialog function smart enough to anticipate the secret purpose reflected in the language of natural input.

3) Works with platform array

User Query: When asking for questions, the user initiates a dialog with the bot; these internal questions create

a) Intents: are the groups that help build or create specific user queries, effectively helping to create categories for various user requests.

b) Entities: these are user query parameters which enable the bot to extract keyword-based responses.

c) Responses: After bot attempts are processed, replies are produced and displayed to the users. Integrating Chatbot with the Web Application

### Issues

The proposed program is a web application and loading the application requires continuous internet, if the internet is inaccessible then the service may not be accessible to users.

### Automated Medical Chatbot

#### Implementation

A Chatbot needs to be natural to respond to user messages, so it needs scalable back-end logic to process user inputs and parameters to produce results. When a user begins to communicate with the Chatbot, the Chatbot engine gets enabled and collects all messages the user has received. The Chatbot tries to use the AIML method to react to messages from the consumer and get suggestions so they can feed into the engine. The machine recognizes the initial symptoms and collects keyword info.

Our Chatbot engine uses keywords derived

from the symptom to list some of the most probable diseases that the consumer can experience by matching the keywords with the tags of the disease. If the engine has shortlisted the user's illnesses, it now needs to narrow down the range to only one disease. Of this, the list of selected diseases is sorted according to the most matches with the keywords and tags.

Now the engine searches for the top 3 symptoms from each of the shortlisted (sorted) categories until all 3 symptoms suit the user, so it will assume that the user has that specific disorder. If any two or more conditions qualify for the same, the patient is linked directly to the doctor. Now the engine recognizes the illness, our Chatbot asks users questions about the symptoms often found in the illness. By assigning a predetermined threshold value against each disease, the engine will calculate the severity of the problem. Each symptom has a serious score against it, too.

The engine retains an Integer variable in which the symptom scores are summed whether they match with the user details. If the score exceeds a value greater than or equivalent to the threshold level, the Chatbot must connect the consumer to a doctor and provide immediate advice and medication until the doctor can chat. The engine also maintains two string arrays named 'Medication' and 'Remedies' throughout the chat session. For each condition which fits the user feedback, the corresponding treatment is stored in the respective arrays. After the Chatbot has done looking for all the signs, it will then supply the person with all the medications and treatments they've encountered during session.

### Issues

The data is stored in XML format in this device chatbot. Displays to the user all the symptoms contained in the database and



asks him to pick in that, if the user selects the symptoms, the name of the respective disease will be given. The system has no decision-making capacity and no machine-learning techniques will be used to categorize the data.

## CONCLUSION

The study indicates that using Chatbot is user-friendly, so it can be used by everyone who learns how to communicate in their own language in smartphone device or web version. A medical chatbot may have symptom-based, personalized therapies. In the future, the effectiveness of recognizing and managing the bot's symptoms will be greatly enhanced by adding support for additional diagnostic features such as place, symptom time and intensity, and more detailed explanation of the symptoms.

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