NLP based Voice Recognition Artificial Intelligent in a Medical Chatbot

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Abstract— People are not aware about all the treatment or symptoms regarding the particular disease. If user have Small problem to go personally to the hospital for check-up which is more time consuming. Such the problem can be solved by using Medical Chat-bot by giving proper guidance regarding health. The medical chat-bots depends on Natural language processing that helps users to submit their problem about the health. reduce man power for handling the telephonic calls using voice chatbot. Identify the disease and gives the suggest the best hospitals. By using Google API for voice-text and text voice conversion.

Keywords: Natural Language Processing (NLP), Medical Chatbot, Voice Recognition Artificial Intelligent, Support vector machine (SVM)

I. INTRODUCTION

The main purpose of the scheme is build to the language gap between the user and healthy providers by giving immediate replies to the questions asked by user. Today's people are more likely addicted to internet but they are not concern about their personal health. They avoid to go in hospital for small problem checkup. Many of the existing systems have some limitations such as there is no instant response given to the patients they have to wait for experts acknowledgement for a long time. Some of process may charge amount to perform live chat or telephone communication with doctors.

This chatbot allows computer to communication between human to computer by using natural language processing (NLP). There are three analysis which understand natural language i.e. identification of main linguistic relationship is completed to parse subject into object of the sentences. After description of the texts is done. Voice recognition is the ability of the machine or program to receive and interpret dictation or to understand and carry the speaking commands. Voice recognition systems enable users to interact with technology simply by speaking to the chat-bot.

The aim of this system is to replicate a person's discussion. The development of chatbot application is can be done with making a user interface to send input and receive response. The medical chat-bots can be developed by using the artificial algorithms that inspect the user's queries and recognize it after give reply to related query. A big disease can start from small problems such as headache which feels normal but it is may beginning of big disease for instance of brain tumor. Most of the disease can be identified by common symptoms so the disease can be forecast if the patient body is analyzed intermittently. Establish the voice recognition technology people easy to give the query and compare to the text conversation voice easy to useable. The system give response by use of a competent Graphical User Interface such that if normal person is chatting with the user. Chatbot that can be used in various application like education, healthcare, and route maps. The central part of the chat-bots includes SQLite. So they can get correct guidance for treatment through application.

II. EXISTING SYSTEM

Chatbots are solid medical allusion books which are the useful not only for patients, and also useful for doctors but also for those who want to learn something about health. The user feels that they feels that they are incorporated in the process of their health. Patients who feel included, who are interacting through chatbots with the healthcare system, will stay with the system, and healthcare provider. The old chatbot are client communication system and their best creation is an question and answer page on a website. Bot can facilitate to prediction of disease without a human interference. Disease prediction depending on the disease symptoms SVM algorithm can predict the disease. Use Google API for voice text and text voice conversation. The Chatbot API sends query to chatbot and get related answer and refer this answer analysis on that display answer on application.

III. EXISTING ALGORITHM

A. Support Vector Machine (SVM)

SVM is a powerful classifier that is able to distinguish two classes. SVM classifies the test image in to the class with highest distance up to the neighbouring point in the training. SVM training algorithm built a model that predict whether the best image fall into this class or another.

The SVM is a learning algorithm for classification which attempt to determine the finest differentiating hyper plane which minimize the error for unseen patterns. The data which cannot be distinguished the input is mapped to high-dimensional attribute space where they can be separated by means of kernels.

If training set of samples and the equivalent resultant values {-1,1}. So SVM intend to get the best separating hyper plane specified by the equation $W^T x + b$ that make use of distance between the two classes as shown in figure.
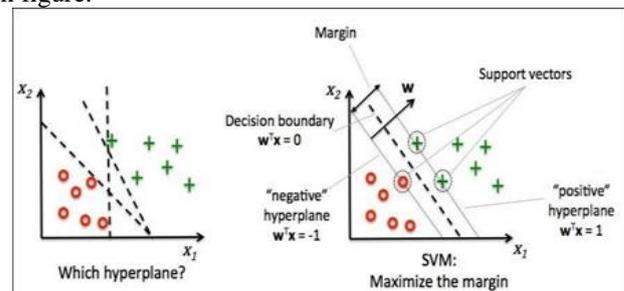

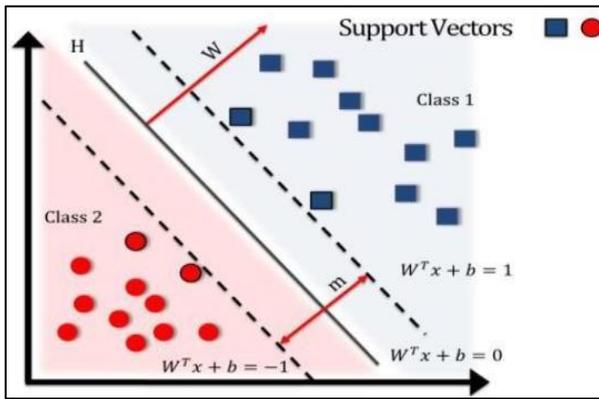Fig. 3.1.1: Distinguishing hyper plane to minimize the error
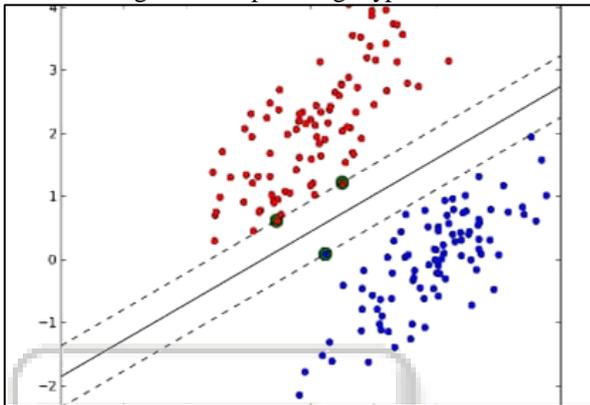
Fig. 3.1.2: separatimg Hyper Plane

Fig. 3.1.3: Predict the possibility of Hyper Plane

B. *NLP (Natural Language Processing):*

Human language is not accurate as it combine on a lot of compound variables. NLP permits users to ask a query. The machine understands the important elements from users speech, that's may related to a appropriate features in a data set, and gives an answer. The use of NLP is to recognize the meaning of the text the stored information contains the text and voice. Symptom related to particular disease on the basic of which we can predict the disease also give best hospital details.

IV. PROPOSED SYSTEM

Some chatbots are used only for identify the disease. But this chatbot also suggest the hospitals and their details. This system helps users to submit their complaints for health. The old chatbot are client communication system and their best effort is a question and answered on a application. Chatbot can facilitate to get a common health related question and disease prediction without a human interference. A reason for many of the people don't have awareness of physical condition because they think they doesn't require a doctor.

A client communicates with chatbot and it works user friendly. Human voice recognition for getting details about symptoms of disease. Incase emergency it call the ambulance. The user can accomplish the real advantage of a chatbot only when it can diagnose all kind of disease and produce necessary information. Hence, people will have an idea about for their health and have the right security.

Automatic created content for health care assistance are chosen instead of classical community generated systems because they are stable, suitable, and

provide instant replies. The basic aim of the system is to link the vocabulary gap between the health providers by producing instant replies for the queries posted by patients. Chatbots are created in a way that the person using it technically believes that they are conversing to an actual human being and not to a machine. Working on the system is as follows.

A. *Give the symptoms*

Bot can ask a symptoms recording some disease and its related to voice to text and text to voice conversation. Using Google API for inter conversation of text-to voice and vice versa.

B. *Disease prediction*

Depending on the symptoms to predict disease using Pattern Matching algorithm.

C. *Online API*

Use Google API for voice-text and text-voice conversion. The chatbot API sends query to chatbot and get related answer and refer this answer analysis on that and display answer and refer this answer analysis on that display answer on android app.

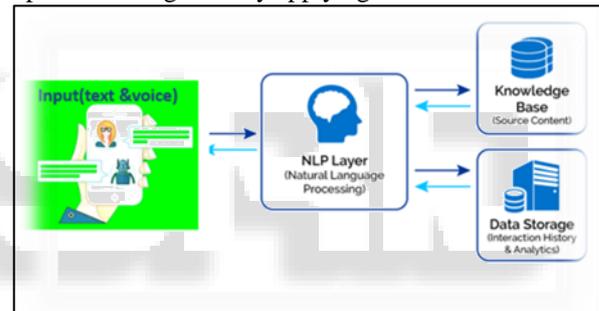When user ask question to the scheme, logic of the complaint is recognized by applying NLP.

Fig. 4: System architecture

V. ALGORITHM EXPLANATION

A. *String matching*

String matching is finding the all occurrences of a pattern in a given text or body of the text. It useful for many applications, while using editor/word processor/browser. It also use for user login and password checking process. It used in virus detection and DNA sequence analysis process
Types of string matching,
1) Exact string matching.
2) Approximate string matching.

B. *Naive string pattern matching algorithm*

Naive pattern matching is a simplest method compare to the other searching algorithm. That algorithms checks for all character of the main string to the pattern. This naive algorithm helpful for smaller texts. It doesn't need any preprocessing phases. It divide the pattern each text one by one and check for matches is occurred. If the match is found then divide by one again two check for sub-sequent matches.

Patterns slide each text one by one and test for a match. When match found return the starting index number

from where the patterns is found in the text. Slide by one again to check for subsequent matches of the pattern in the text.

1) Algorithm

The naive approach tests all the possible placements of pattern P[1.....m] relative to text T[1.....n]. We are try shift s=0,1.....n-m, successively and for each shift s. Compare T [s+1.....s+m]to P[1.....m].

The naive string pattern matching algorithm finds the all valid shifts using the loop that checks the conditions p[1....m]=T[s+1.....s+m] for all of the n-m+1 possible value of s.NAIVE STRING MATCHER(T,P)

n ←length[T]

m ← length[P]

for s ← 0 to n-m

do if p[1....m] = T[s+1....s+m]

then print "pattern occurs with shift" s

Example

Text: A A A C B B B A A A A C B B B

Pattern:A C B B

 A A A C B B B A A A A C B B B

     A C B B   A C B B

Pattern match found at 2,10.

C. Latent Semantic Analysis

Latent semantic analysis another name is Latent semantic index (LSI).It uses bag of word model (BOW) which result in the term of document matrix. Latent semantic analysis learns latent topics by performing the matrix decomposition on the document term matrix using singular value decomposition. LSA is a classical tool for automatically extracting similarities between document, through dimensionality reduction. LSA used for dimension reduction and noise reducing techniques.

1) Singular Value Decomposition (SVD):

It is the matrix factorization method that represent matrix form in the product of two matrix. It use various applications in sociology, psychology, Signal processing and Climate....etc.

$$M = U \sum V^*$$
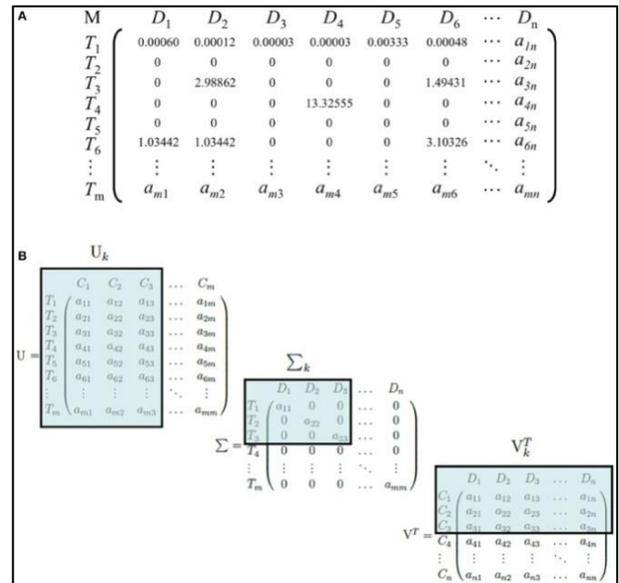
M is an m*m matrix.

U is an m*n left singular matrix.

$\sum$ is an n*n diagonal matrix with non-negative real numbers.

V is an m*n right singular matrix.

V* is an n*m matrix, V* is the transpose of V.

2) Singular matrix:

Matrix is a singular if it is determinant is 0 or square matrix that does not have a matrix inverse.

VI. CONCLUSION

A medical chatbot concept we are using large dataset which will ensure the better performance compared as earlier. Thus we build up a medical chatbot useful for people disease related quires by using voice and text.

We are using natural language process technology that communicate computer to human using RNN algorithm for predict the disease based on the symptoms. User can get details in front of web.

VII. FUTURE ENHANCEMENT

Advantage of the extensibility of the system in future it will be used as face recognition to mimic a counselor, also interacting with the patient at deeper levels.

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