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DISEASES PREDICTION SYSTEM USING MACHINE LEARNING AND HAND GESTURE

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ABSTRACT--*Analysis of various symptoms and finally diagnosing the possible disease is an important issue nowadays. Apart from this , we have tried to solve the problems of physically challenged persons by accepting gestures which could be used for feature detection , extraction and finally matching with the clusters made.The image classification is supposed to be done using convolution neural networks. And the diseases prediction process is based on the well known machine learning algorithm such as DecisionTree,Naive Bayes and Random Forest and by using these algorithm diseases can be predicted more accurately even they have mostly the same symptoms and is also helps to get symptoms from disabled persons using Hand Gesture.*

Keywords--*Gesture recognition,ImageProcessing, Naive Bayes technique*

I. INTRODUCTION

The diseases prediction system works on the input provided by the user and tries to generate output with maximum possible accuracy so that lots of time and money of the user could be saved.The system uses well known algorithms of machine learning such as Naive Bayes,Decision Tree,Random Forest, coming up with most accuratediseases based on the symptoms given by the user.

Furthermore , this system is been designed for disabled person who can't speak or listen and so they can give their symptoms using our hand gesture.As the system suggests the appropriate diseases in a very short amount of time so it can be used very oftenly and helpful for quick results.

II. GESTURE RECOGNITION

In this System we are using Hand Gesture Technique to get the symptoms of the disabled person like deaf and dumb people. And to do that we are using OpenCV for that purpose and we have also tried to use some of the libaries of the python for the mathematical computation such as numpy for creating matrix and panda for other complex computation.

In this we are trying to figure out the angles between the fingers of the hand and we are also trying to detect the number of defects in the hand and the area ratio to determine how many fingers are currently showing to the webcam and by this way we are trying to figure to patients sympt

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III. MACHINE LEARNING

Decision Tree is a Machine Learning ALGORITHMS

Supervised Learning Algorithm is the most commonly used machine learning algorithm and these types of algorithm are supported in various algorithms like support vector machine for solving Classification Problem and it is been named so because in this type of algorithm we have the input and we also have the output from that corresponding input so the computer or machine learns how to process or analysis the data to get the required output from the corresponding input and so it trains or learns itself by using the data of input as well as that of output. And this type of algorithm can be used like to identify the images of animals from a particular set of images.

Unsupervised Learning Algorithm is that kind of machine learning algorithm in which the algorithm only has input of the data but it does not have the output of the corresponding input of the data.These of algorithm are generally used to get the information about the underlying structure of the data to devise something more about the particular set of data.These types of algorithm are used to solve various problems like k-means for clustering problem,Apirori for association rule problem etc.

There are generally two types of problems which can be solved

1)**Clustering:**It is a type of Problem where you want to search the inherent properties of the data.

2)**Association:**It is a type of Problem where some set of rules can able to describe large set of portion of dataAlgorithm which comes under the category of Supervised Learning and it makes various kinds of rules and divides

the data in the form of tree –like structure or model and it divides whole problem or information in the form of nodes and it is used in various tasks like classification and regression tasks

Naive Bayes algorithm is generally based on the famous algorithm known as Bayes Algorithm and it is the most commonly used machine learning algorithm for classification purpose and it is very simple to understand and easy to use and it uses Maximum Posterior decision rules for the probability classification purposes and it also helps us to solve many other prediction problems.

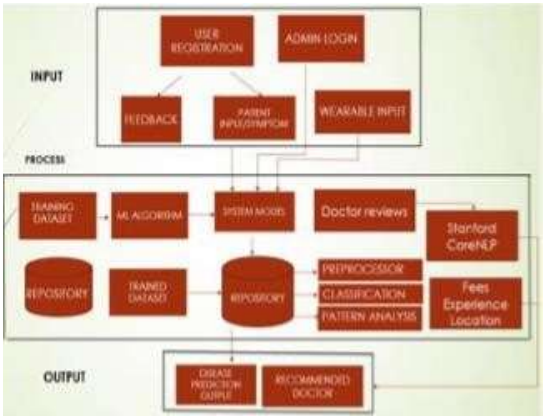
Random Forest algorithm is the most commonly used machine learning algorithm and it is based on supervised learning algorithm and it works just like the Decision Tree Machine Learning algorithm but it is been used for the broader aspects and it uses the same as that of bagging method and Decision Tree.But Random Forest solves the problem of overfitting which is been present on the Decision Tree Algorithm.

IV. ARCHITECTURE AND MODULE

A potential system has to be built which would accept the desired input from the user and after a detailed analysis ,to predict the possible diseases.

For the above mentioned process , the input in the form of hand gestures is considered and analysed with the help of machine learning algorithm and some image classification techniques.

For predicting best and accurate results , we will use supervised machine learning algorithm such as Decision Tree,Naive Bayes etc..



Modules used in the System are:

User Input: In this module we get the input from the user with various technique such as text-based for normal people and gesture based input from handicap people .In this we ask the people to input their symptoms which they were suffering from

Data Classification:

In this,firstly we characterize the inputted data according to the gender of the user and then divide thedata with of various input symptoms and tries group them according to the number of days these symptoms were lasted

Diseases Analysis Module:

In this we try to use various machine learning algorithm like Decion Tree,Random Forest, Naive Bayes Classification etc to group the data from previous module according to the symptoms which is been matched from the symptoms and duration of the particular diseases.

Output Data:

In this we output the most acccurate diseases which the patients may be suffering from and does not only gives only one possible but three possible diseases based on using three different machineand by using some training set.

V. WORK FLOW OF THE SYSTEM

The Following flow chart shows the working of the Diseases prediction System using Hand Gesture. Following Steps are Performed to interact with the system:

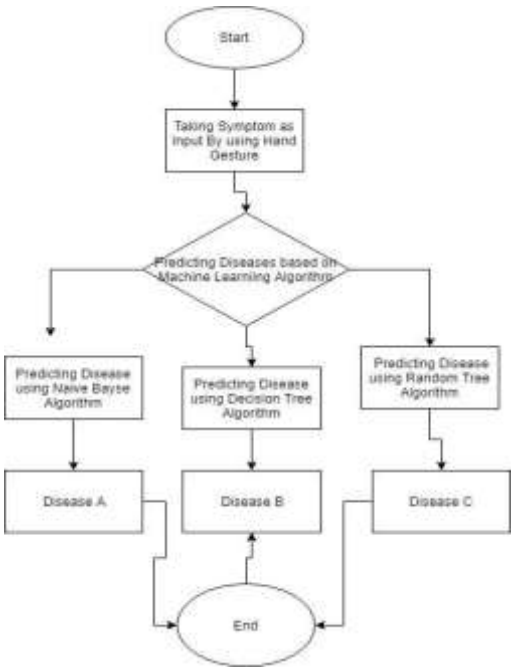
1. Firstly We need to input Symptoms into the system which can be done by using our Hand Gesture Techniques.
2. After that we are generally using three main machine learning algorithm to predict the diseases.
3. First algorithm is Naïve Bayes which uses Naïve Bayes Theorem to predict the dieseases with the help

of training data set.

4. Second Algorithm is Decision Tree in which we make various decision rules and according to that rules we are able to predict the disease

5. Third Algorithm is Random Tree which is just like a Decision Tree but it gives more broarder or general solution as compared to Decision tree.

6. After applying all this algorithm we get three different predicted disease based on the given symptoms by the user.algorithm used is less efficient when comapred to other algorithms of machine learning in the context of diseases prediction



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VI. TRADE OFF BETWEEN EXISTING AND PROPOSED SYSTEM

A.EXISTING SYSTEM

The existing system is based on naïve bayes algorithm to predict the disease with which the user is suffering based on the symptoms provided as an inpu

The other system proposes to perform image classification using feature detection , feature specification and code generation . The main algorithm used is SVM model for classification and regression.

LIMITATION OF EXISTING SYSTEM

1. The main limitation of the existing system is the inability to take hand gestures as inputs properly.

2. The other limitation is that the system fails to provide accurate disease and doesn't take into account all the possible symtoms for the analysis part.

B.PROPOSED SYSTEM

The Proposed system is based on

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1. A diseases prediction system based on naïve bayes theorem and machine learning algorithm for classification and clustering respectively.

2. Use of efficient algorithms like Random Forest and Decision Tree to improve the efficiency and speed of analysis..

3. Accepting inputs in the form of text as well as gestures to extend the user base and help the general as well as physically challenge persons.

EFFICIENT ALGORITHM PROPOSED TO BE USED

1. Naïve Bayes Algorithm
2. Open CV
3. Decison Tree
4. Random Forest Learning Machine

VII. SCOPE AND CHALLENGES

Medical Diagnosis is considered as that field in which very precise work is required but most of the time these decision were taken by the doctors and by their experience in the medical field rather than dependent on the knowledge which is there in the database.These errors will increase the cost of medical services and also affects the quality of services which is been provided to the patients.

In these kinds of Situations various data- mining techniques can be used to generate arich knowledge database or environment and help us to make various decision correctly which can be related to clinical decision.

Here the scope of the project can be improved by integrating clinical decision made by the doctor and computer-based patient record which helps us to reduce some common medical errors, increase patient safety and also decreases unwanted practice variation.The main objective of the project is to develop a system which predicts the disease by taking symptoms from the patients and it predicts the diseases by using three machine learning algorithm like Decision Tree,Random Forest, and Naïve Bayes.As we are using three different algorithm to predict the disease we can able to predict the most correct disease for a particular patient and it also enhances visualization and ease of interpretation.Many corporation invest lots of money in these kinds of projects to help focus on various possible events and risks which are involved in it.

VIII. CONCLUSION

This paper focuses on the application and development of input based assistant

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