March-April 2020
ISSN: 0193-4120 Page No. 1626 - 1629

Heart Disease Prediction System

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Article Info
Volume 83
Page Number: 1626 - 1629
Publication Issue:
March - April 2020

Abstract

Heart disease prediction has become one of the serious issues in INDIA particularly in ANDHRA PRADESH. Managing heart isn't a simple errand in light. According to the statistics, the passing pace of individuals is 6 out of 10 who are being diseased and effected by coronary illness. The fact is that, occasionally specialists do flop in foreseeing the illness and diagnosing it since an extremely uncommon number of the frameworks anticipating heart illnesses dependent upon a few attributes like: age, family ancestry, diabetes, hypertension, cholesterol, tobacco chewing, smoking, liquor consumption, weight or physical dormancy, and so on. To improve the prediction system, a framework has been proposed which can anticipate the heart disease effectively by considering some extra attributes such as self-potential slope curve, self-potential depression level, and chest pain. The primary point is to locate the best arrangement utilizing the past informational indexes and check whether the individual have a heart issue or not. Classification algorithms – Decision tree, Naïve bays theorem, support vector machine, logistic regression are implemented and by combining the result prediction is done.

Keywords**:** *Heart Disease, Decision tree, Naïve Bayes, Support Vector, Logistic Regression.*

Article History
Article Received*: 24 July 2019*
Revised*: 12 September 2019*
Accepted*: 15 February 2020*
Publication*: 15 March 2020*

1. Introduction

Heart is a central functioning unit in the living organism. Its responsibility is to make sure that it has pumped blood to all organs. What if it does not succeed to function correctly, then within a few minutes, the person may be sentenced to death without his consciousness, taking stress and taking untidy food stimulates to increase several heart related problems.

Heart disease has become one of the most hierarchical cause of death all around the World. According to the survey by world health organisation (W.H.O), heart related disease is responsible for the taking 16.7 million lives every year, 21% of all global deaths. Out of this survey India has also become a leading part in that. Heart disease have killed 1.6 million Indians in 2016,according to the global burden of disease report in 2016.a disease is one in which it spoil not only the person but also the financial stability of a person when coming to it would become much more higher impact than other. Estimates made by the world health organisation (W.H.O), suggest that India have lost up to $230 billion, from 2005-2016, due to heart related disease. Thus, there is a need and demand for a feasible and accurate prediction of heart related disease.

Organisations in medical field collect data from all around the world, the data can be of any disease. Later that data can be analysed and used in different fields of which machine learning techniques to gain useful insights. The data that is collected is not in a structure format and also classification of the data set can also be a major task for human knowledge so we can implement a machine learning technique in that area.

Therefore, usage of these algorithms have become very useful and important in recent times, to predict the presence or absence of heart related disease accurately.

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2. Related Work

2.1 Existing System

However, the existing model have worked mostly on the structured what if data is going to be an unstructured one, for instance, text characterizing automatically algorithm using convolution neural network has become an attracting piece of algorithm by its result. Further, as each region have different kinds of factor that affect to heart because of different kind of climate and of their lifestyle. Thus, the classification of solution should be different for different places using big data classification should be done and there are some unanswered questions are giving rise to this like how a missing field of data should be readdressed how a particular region should get a solution using big data. In this [1] they used a random forest algorithm to predict the risk whereas in this we can find the risk factor for a person but in our model different attributes have different priorities in a place so for a particular place we need to take factor of that place. The percentage of algorithm succeeded [2] (HRFLM) after pre-processing the taken data the accuracy can be improved by further implementation. The latest neural network with back propagation technique based on doctor preserved data this model is built but this cannot be the case for all patients so the system cannot give that accurate result than that of ours. There are four algorithms used in this [11]. In today's era deaths due to heart disease has become a major issue approximately one person dies per minute due to heart disease. Six algorithms has used in this [12] where each individual has given an accuracy Effective Heart Disease Prediction Using Hybrid Machine Learning Techniques. Here we has used 7 algorithms. In these algorithms random forest has given more accuracy when compared to other.

2.2 Proposed System

Proposed a system which can be used at different places on their smart devices and based on the tests on patients the attributes are filled and get a clear output. This result is from the heterogeneous data that has been completely studied.

Support Vector Machine (SVM) is a supervised machine learning algorithm which is used to solve multiple class classification. We Give a set of training examples, marked in either of the two classes. SVM algorithm builds model that assign each new example of the dataset to one of those classes.

Here we come across a two new problems whereas for a linearly separable data SVM uses a linear kernel which classifies dataset among different classes using a linear hyperplane. Where for the other the non-linear data we should built up and perform. In this our approach was to try different classifier algorithm and put the best solution of the all algorithm and find a good result of whether the person has a heart disease or not.

We also apply Logistic regression and Decision tree to get the more accurate details from the data been provided by the users.

3. Implementation

3.1 Data Pre-Processing

Various amount data has been collected and it is pre-processed of which a total of 303 records are formed and of which 6 are said to be null set they have been removed from the data set and a total of 297 records are used. A multi class variable along with a binary classification. The output of the algorithm is presented in binary format and the final result will be considered of them and give a output of whether he has a heart problem or not. The presence in the algorithm will be set.

Attribute	Description	Type
Age	Patient's age in completed years	Numeric
Sex	Patient's Gender (male represented as1 and female as 0)	Nominal
Cp	The type of Chest pain categorized into 4 values: 1. typical angina, 2. atypical angina, 3. non-anginal pain and 4. asymptomatic	Nominal
Trestbps	Level of blood pressure at resting mode (in mm/Hg at the time of admitting in the hospital)	Numeric
Chol	Serum cholesterol in mg/dl	Numeric
FBS	Blood sugar levels on fasting > 120 mg/dl; represented as 1 in case of true, and 0 in case of false	Nominal
Resting	Results of electrocardiogram while at rest are represented in 3 distinct values: Normal state is represented as Value 0, Abnormality in ST-T wave as Value 1, (which may include inversions of T-wave and/or depression or elevation of ST of > 0.05 mV) and any probability or certainty of LV hypertrophy by Estes' criteria as Value 2	Nominal
Thali	The accomplishment of the maximum rate of heart	Numeric
Exang	Angina induced by exercise. (0 depicting 'no' and 1 depicting 'yes')	Nominal
Oldpeak	Exercise-induced ST depression in comparison with the state of rest	Numeric
Slope	ST segment measured in terms of the slope during peak exercise depicted in three values: 1. unsloping, 2. flat and 3. downsloping	Nominal
Ca	Fluoroscopy coloured major vessels numbered from 0 to 3	Numeric
Thal	Status of the heart illustrated through three distinctly numbered values. Normal numbered as 3, fixed defect as 6 and reversible defect as 7.	Nominal
Num	Heart disease diagnosis represented in 5 values, with 0 indicating total absence and 1 to 4 representing the presence in different degrees.	Nominal

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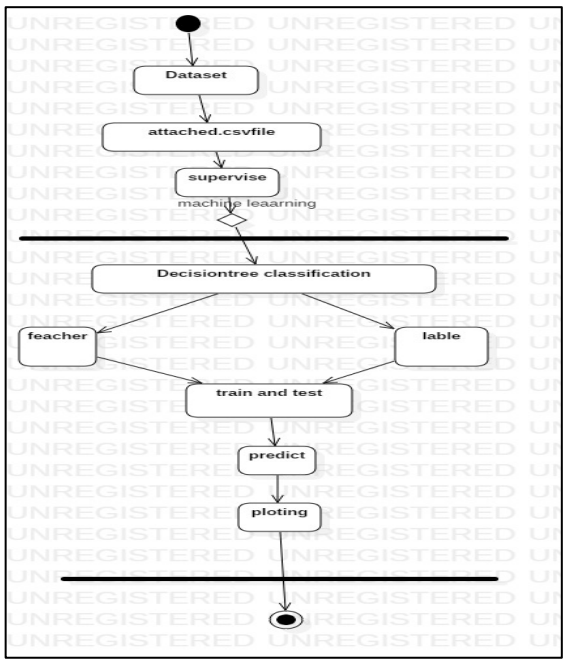
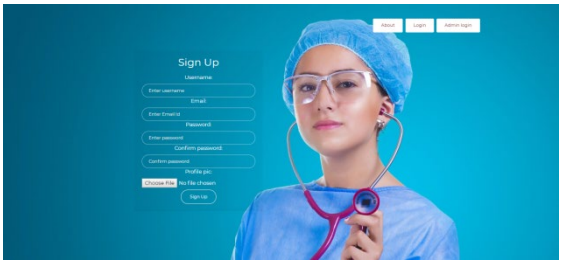
3.2 Block Diagram

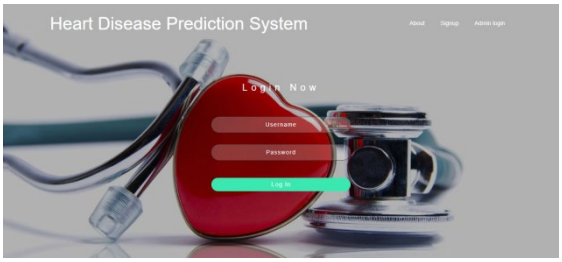


4. Experimental Results

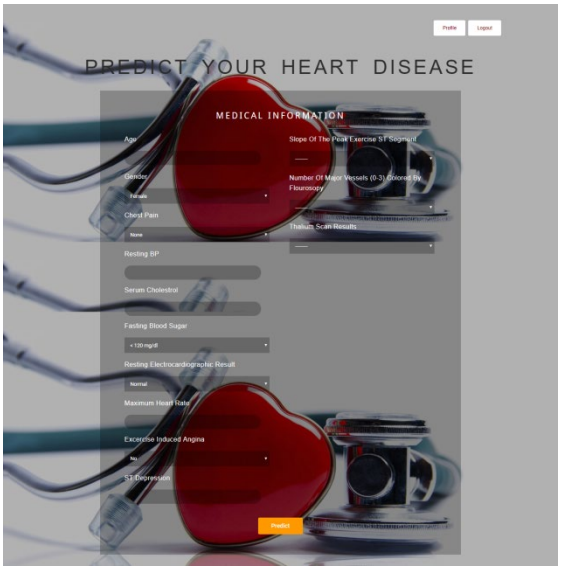
a) Login page appears once the Django server is run the URL produced can be placed in any of the browser and it gives the login page.



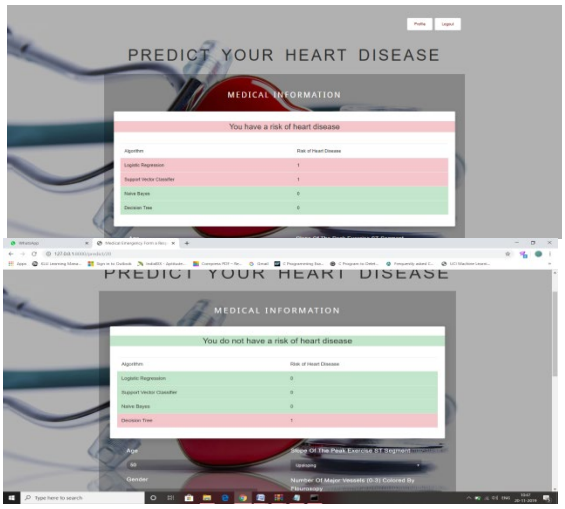
b) If you have the login you can directly login or else you can sign up by creating a new account.



c) After login you have to enter given attributes which are done by the doctor and the values should be given accordingly and after entering you will have a predict option at the bottom of the html page click on it for result.



d) At the top of the html page you will get your result if the answer is in green you don't have a heart disease as in the second image if it is in red you have a risk of heart disease.



5. Conclusion

By using various data mining and machine learning systems, anticipation of the event of coronary illness have abridged. A single algorithm may have the chance of wrong prediction whereas when we perform the same task with the four different algorithms, the result will be better. Hence there is a need for combinational and more complex models to increase the accuracy of predicting the early onset of heart disease. With the more amount of data being fed into the database the system will be very intelligent.

There are numerous possibilities that the system can be further investigated to improve the scalability and exactness of this prediction system. Because of time restriction, the accompanying work should be performed for what's to come. Might want to utilize testing

distinctive discretization methods, various classifiers casting a ballot system and diverse choice tree types in particular data pick up and gain proportion. These kinds of systems can be developed more for other parts of the body also. Therefore, it would stand as the basic system for the upcoming projects. As it would stand as the basic system for the upcoming projects.

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