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Classification of Heart Disease Using Various Classification Techniques

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Abstract: ***Day by day research work is going to their ace point and tense to become perfection. Medical science is one of the broad area for research. Heart disease is one of the serious disease facing by human society. In this paper we analysis the Random Forest(RF), C4.5, Simple Cart(SC), Bayes Net (BN), Multilayer Perceptron(MLP), Random Tree (RT) and REP Tree algorithms to recognize the heart disease. We analysis an individual model and achieved 83.5165% of accuracy with Bayes Net in WEKA environment.***
Keywords: ***Classification Technique, Bayes Net, Decision Tree.***

I. INTRODUCTION

In the modern era medical science is in their pick of research and moving on. Human being are day by day take new steps on the technology and medical science research. Diabetic, Heart Disease, Kidney failure and many more health related issues which are very growing speedily. Heart diseaseis one of the very dangerous disease. Classification is a good method through we recognize heart disease accurately. There are various author worked in classification on heart disease. C. S. Dangare et al. (2012),suggested two more attributes i.e. obesity and smoking. The data mining classification techniques, namely Decision Trees, Naive Bayes, and Neural Networks are analyzed on Heart disease database. The performance of these techniques is compared, based on accuracy.To develop this system, medical terms such as sex, blood pressure, and cholesterol like 13 input attributes are used. To get more appropriate results, two more attributes i.e. obesity and smoking are used, as these attributes are considered as important attributes for heart disease. [1]. T. Revathi et al. (2013), discussed various approaches of data mining which are useful in predicting the heartdisease. One of the complex tasks in healthcare industry is predicting of heart disease and it requires more experience and knowledge. Some of the ways of predicting heart diseases are ECG, stress test and heart MRI etc. Here the system uses 14 parameters for predictingheart disease that include blood pressure, cholesterol, chest pain and heart rate. [2]. A. Jarad et al. (2015),Two data miningclassification techniques were applied namely K-means &Naive Bayes. As shown above, it is clear that Naïve Bayeshas better accuracy in less time than others. [3]. Rajesh Jagtap (2015), To find out the accuracy of single data mining techniques andcompare it with the accuracy of hybrid data mining techniquesto diagnose the heart disease.To exploit the usefulness of hybridized data mining techniquesin heart disease diagnosis and discover the suitable treatmentfor heart disease patients.[4]. N. Kishore (2015),this work presents Electrocardiogram (ECG) classification to diagnose patient's condition. For classification of such Difficult to Diagnose Signals, P-Wave, PR-Interval, QRS Interval, ST Interval, T- Wave etc, analysis of each Input pulse used to train the neural network and features are obtained using Genetic Algorithm. Output of the neural network gives weight factors of each signal to create a data set. Electrocardiogram (ECG) PQRSTU-waveforms time intervals and weight factors and prediction of particular decease infection or state of a patient condition saved in database. [5].M. A. jabbaret al. (2013),In this paper we propose anew algorithm which combines KNN with genetic algorithm for effective classification. Genetic algorithms perform globalsearch in complex large and multimodal landscapes and provide optimal solution. Experimental results shows that our algorithmenhance the accuracy in diagnosis of heart disease. [6].

II. TOOLS AND TECHNIQUES

In this section we define various data mining based classification technique through which we classify the UCI repository based heart disease data set[7].The data set contains 13 features and 303 instances with two classes. The data set is binary class problem.
Decision tree is data mining based classification techniques to generate the rules and classification of data based on this rule.Decision tree (Han J.et al.., 2006) [8] is most popular and powerful classification techniques in which in the training stage a treelike structure is formed where each non-leaf node is decision node which splits according to the features of training data while leafnode represent class node, Once the decision tree is formed, unknown samples can be presented to the root node of decision tree andultimately reaches to the class node to classify the sample as one of the target class. In this research work, we have used C4.5,

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SC and RF and C4.5 as decision tree (A. K. Pujari, 2001) [9].

Classification algorithms [8] have found a simple Bayesian classifier known as the Naive Bayesian classifier to be comparable in performance with decision tree and selected neural network classifiers. Bayesian classifiers have also exhibited high accuracy and speed when applied to large databases.

III. EXPERIMENT RESULT

This research work focus on various decicion and BayseNet, Multilayer Perceptron(MLP) [8] are used as classifier for classification of heart disease. The accuracy in individual model as BayseNet gives better accuracy with 70-30% partition in case of binary class problem as compare to all mention models as shown in table 1. BN model provide highest accuracy 83.5165% as respect to models shows Table 1. Fig 1. Shows that accuracy of individuals models with binary class.

Table 1: Accuracy of individuals models with binary class (70-30%)

Model	Accuracy
Random Forest	80.2198 %
Simple Cart	78.022 %
C4.5	82.4176 %
BayseNet(BN)	83.5165 %
MLP	79.1209 %
Random Tree	72.5275 %
REP Tree	82.4176 %

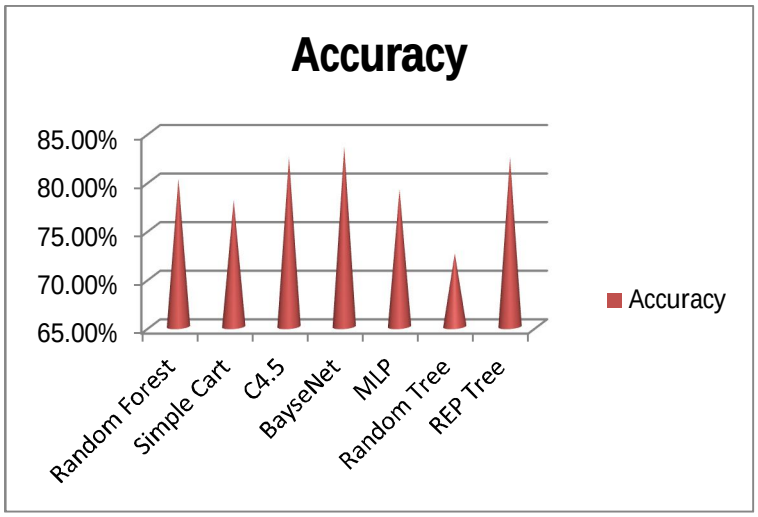

Fig 1.Accuracy of individuals models with binary class

IV. CONCLUSION

Diagnosis of heart disease is very dangerous disease faced by most of human being. Classification is a method through which we find out the heart disease patient or normal patient. In our work, we analyzed models in which BN, RF, C4.5 and REP Tree gives better result. BayesNet (BN) provides better result among all models and get 83.5165% accuracy.

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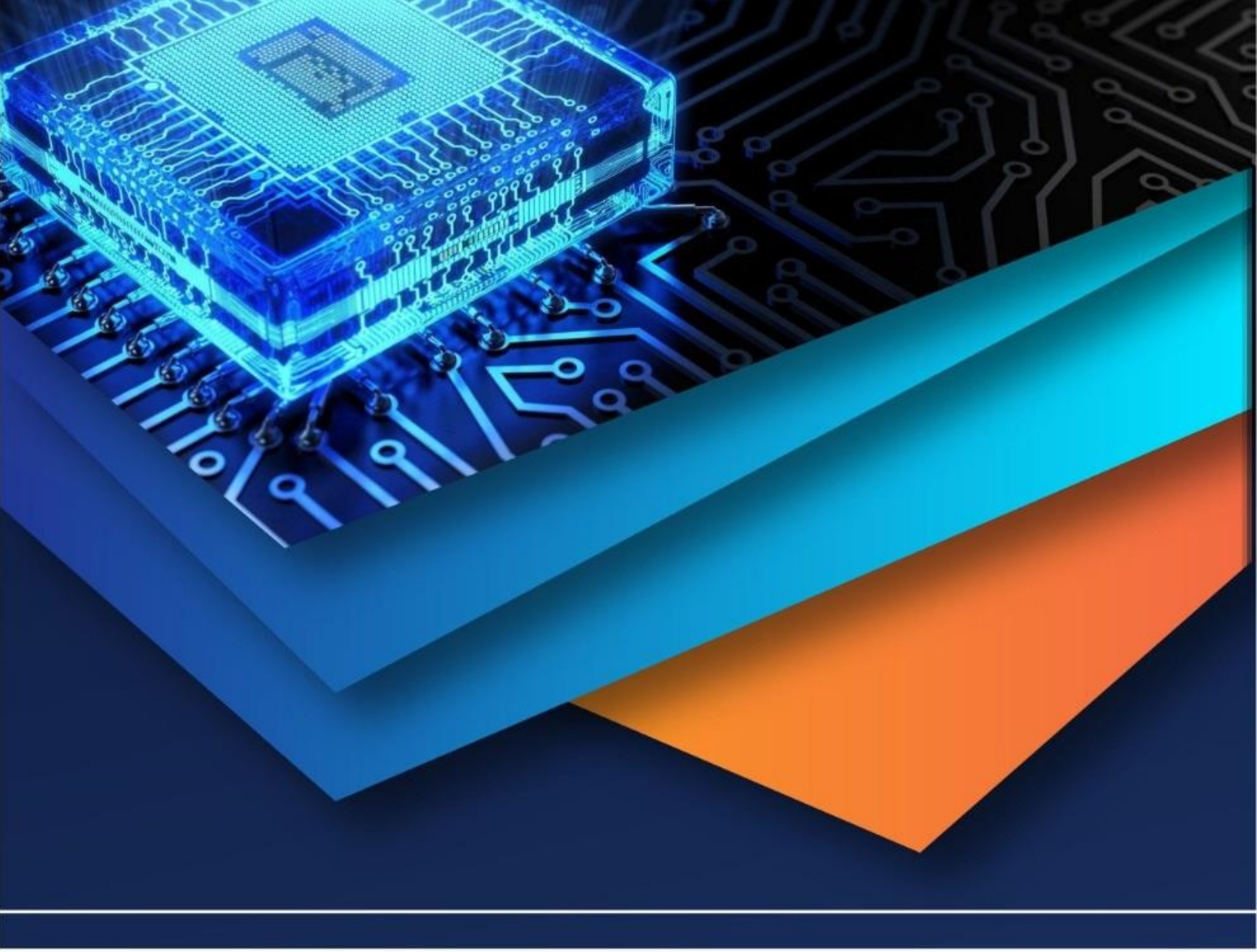

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