IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 4, April 2017

Prediction of Heart disease using Neural Network

Pramila Nagar

Rajasthan Technical University

Abstract: The coronary illness records to be the main reason for death around the world. It is troublesome for medicinal experts to foresee the heart assault as it is a mind boggling assignment that requires experience and learning. The health sector today contains hidden information that can be important in making decisions. Data mining algorithms such as J48, Naïve Bayes, REPTREE, CART, and Bayes Net are applied in this research to predict the disease, But most conveniently we can use neural network to determine the accurate results that can predict the Heart disease.

Keywords: Heart Disease, Data Mining, Neural Network.

1.INTRODUCTION

HEART disease maladies remains the primary driver of death around the world, including South Africa and conceivable identification at a prior stage will keep the assaults [1]. Therapeutic professionals create information with an abundance of covered up data present, and it's not appropriately being utilized viably for expectations [1]. For this reason, the examination changes over the unused information into a dataset for displaying utilizing diverse information mining strategies. Individuals kick the bucket having experienced manifestations that were not taken into contemplations. There is a requirement for medicinal specialists to foresee coronary illness before they happen in their patients [2]. The components that expand the likelihood of heart assaults are smoking, absence of physical activities, hypertension, elevated cholesterol, undesirable eating routine, unsafe utilization of liquor, and high sugar levels [3][4]. Cardio Vascular Disease (CVD) joins coronary heart, cerebrovascular (Stroke), hypertensive heart, inherent heart, fringe supply route, rheumatic heart, provocative coronary illness [3].

1.1 The risk factor for heart disease

Family history of heart disease: - most people know that the heart disease can be families problem. That if anybody has a family history of heart disease, he/she may be at greater risk of heart attack, stroke and other heard diseases. Smoking: - smoking is major cause of heart attack, stroke and other peripheral arterial disease. Nearly 40% from people over the world who die from smoking tobacco do so due of heart and blood vessel diseases. A smoker's risk of heart attack reduces rapidly after only one year of not smoking. Cholesterol: - levels of lipids (fats) in the blood are risk factor of heart diseases. Cholesterol is a soft, waxy substance found among the fats in the blood vessels and in all the body's cells. High level of triglyceride (most common type of fat in body) combined with greater levels of LDL (low density lipoprotein) cholesterol speed up atherosclerosis increasing the risk of heart diseases.

High blood pressure: - High blood pressure also known as HBP or hypertension is a widely wrongly understood medical condition. High blood pressure increase the risk of the walls of our blood vessels walls becoming too stretched and injured also increases possibility of having heart attack or stroke and of having heart failure, kidney failure and peripheral vascular disease.

Obesity: The term obesity is used to describe the health condition above ideal healthy weight. Being obese puts anybody at a higher risk for health problem such as heart disease, stroke, high blood pressure, diabetes and more.

Lack of physical exercise: -lack of exercise is a risk factor for developing coronary artery disease (CAD). Absence of physical exercise increases the chances of CAD, because of it there is occurrence of diabetes and high blood pressure.

2.LITERATURE SURVEY

S.Florenceet al. [1] presented an intellectual and efficient method of heart attack prediction using data mining techniques. Data preprocessing is an important step in knowledge discovery process. It includes cleaning, integration, transformation and data reduction. Cleaning includes filling of missing values which is a major role in the existing paper. Data transformation routines convert appropriate forms of technique. Replace missing values will scan all nominal or numerical attribute and using a discretization filter it will convert it numerical to nominal attribute.

Harsha Yeole1 et al. [2] used two algorithms such as Back Propagation Neural Network and Genetic Algorithm. Heart disease can be predicted using optimal attribute on data set.

Dr. K Usha Rani et al. [3] proposed that Classification is a major problem in the rapidly emerging field of data mining. Many problems related to business and industry can be treated as classification problem.Neural network is best suited for treating linear and noisy data. It is used for prediction of heart disease. Single and multi-layer neural networks are

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 4, April 2017

been tested with the dataset. Backpropagation algorithm with momentum and variable learning rate is used to train the networks.

Nabeel al milli et al [4] presented an approach to model back propagation neural network is used to design heart disease diagnoses. Disease prediction system is developed using neural network. The proposed system uses 13 medical attributes for heart disease predictions. Experiments prove that the good performance of the proposed algorithm.

Hlaudi Daniel Masethe, Mosima Anna Masethe et al [5] Various Data mining algorithms such as J48, Naïve Bayes, REPTREE, CART, and Bayes Net are applied in this research for predicting heart attacks. Prediction accuracy is of 99%. Data mining enable the health sector to predict patterns in the dataset. The model from the classification will be able to answer more complex queries in the prediction of heart attack diseases.

3. RELATED WORK

The research have worked with data mining and pattern recognition to predict the disease. The Research was carried out using classification algorithm. The researchers used various algorithm such as Naïve Bayes, Decision Tree to predict the disease. The clustering algorithm such as K-means wereused to extract the required data.

The research paper [10] describes the prototype using naïve bayes and weighted associative classifier (WAC) to predict the probability of patients receiving heart attacks[12].The researchers [10] used the information miningalgorithms decision trees, naïve Bayes, neural networks, association classification and genetic rule for predicting and analyzing cardiovascular disease from dataset. Associate degree experiment performed by the researchers on dataset created a model mistreatment neural networks and hybrid intelligent. The analysis paper describes the epitome exploitation naive Bayes and weighted associative classifier (WAC)to predict the likelihood of patients receiving heart attacks. The researchers developed aninternet basedmostly intelligent system exploitation naïve Bayes algorithmic program to answer complicated queries for diagnosis cardiovascular disease and facilitate medical practitioners with clinical choices.The scientist uses association rules representing a technique in data processing to boost illness prediction with great potentials. Associate in Nursing algorithmic program with search constraints was also introduced to cut back the amount of association rules and valid exploitation train and check approach. Three popular data processing algorithms (support vector machine, artificial neural network and call tree) were utilized by the researchers to develop a prediction model exploitation502 cases. SVM became the simplest prediction model followed by artificial neural networks. The researchers uses call trees, naïve Bayes, and neural network to predict cardiovascular disease with fifteen widespread attributes as risk factors listed within the medical literature.

4. METHODOLOGY

The Method consist that a dataset is applied nntool in matlab. Then process of training and performance evaluation takes place and final result is calculated.

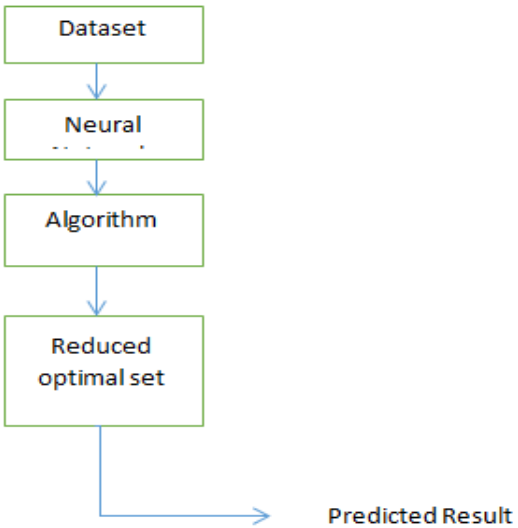

Figure. Flow Diagram of System

4.1. EXPERIMENTATION SETUP

MATLAB (matrix laboratory) is a multi-paradigm numerical +computing environment and fourth-generation programming language. A proprietary programming language developed by Math Works, MATLAB

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 4, April 2017

allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C, C++, Java, Fortran and Python model of an out-of-order CPU. The process involves Learning Algorithms as follows:

The Learning and Training Algorithm are mathematical functions used to find Networks weights.Neural Network Toolbox supports a variety of training algorithms, including several gradient descent methods, conjugate gradient methods, the Levenberg-Marquardt algorithm (LM), and the resilient back propagation algorithm.

1. Preprocessing, Post processing and Generalization:

Preprocessing the network inputs and targets improves the efficiency of neural network training. Post processing enables detailed analysis of network performance. It also decreases the dimension of input using component analysis.

2. Training of Neural Network:

Matlab consist of nntool for processing of data. In this we can train the dataset. For training dataset we consider Feed forward Neural network. The nntools has plots which helps to find performance and gives confusion matrix.

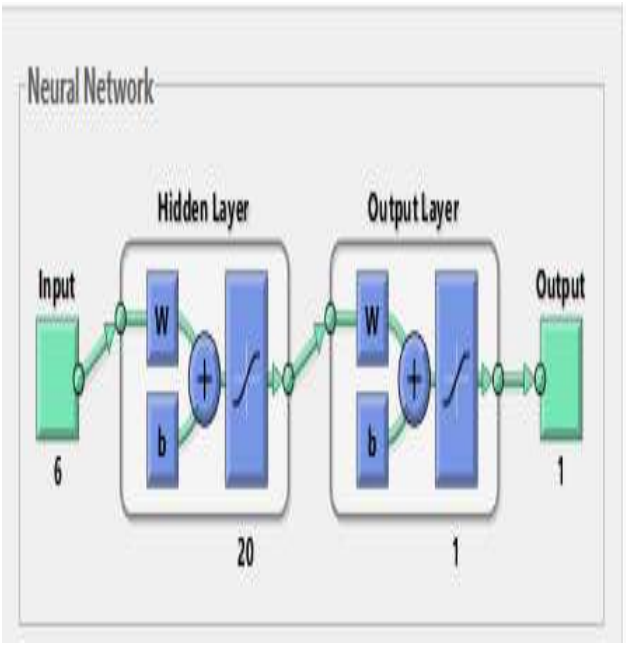

Figure 1.Training of Neural Network

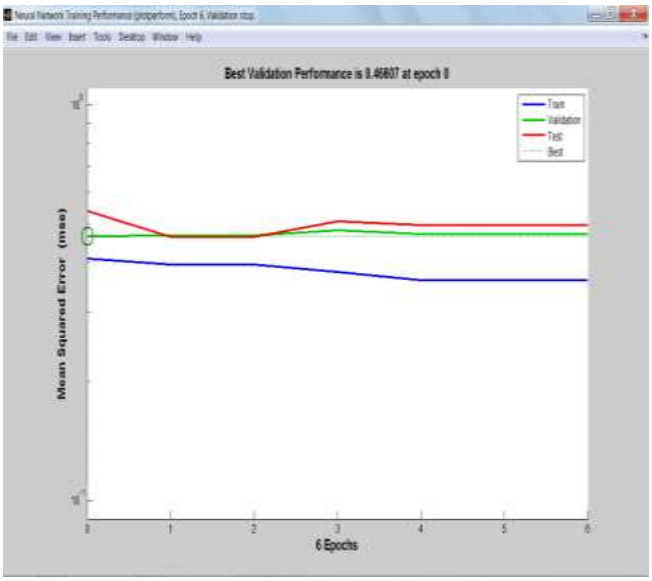

Figure 2. validation

2.**Code Generation**

In this load is used to load the dataset in to matlab. PrnetisStored in variable. And output is used to display the output.

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 4, April 2017

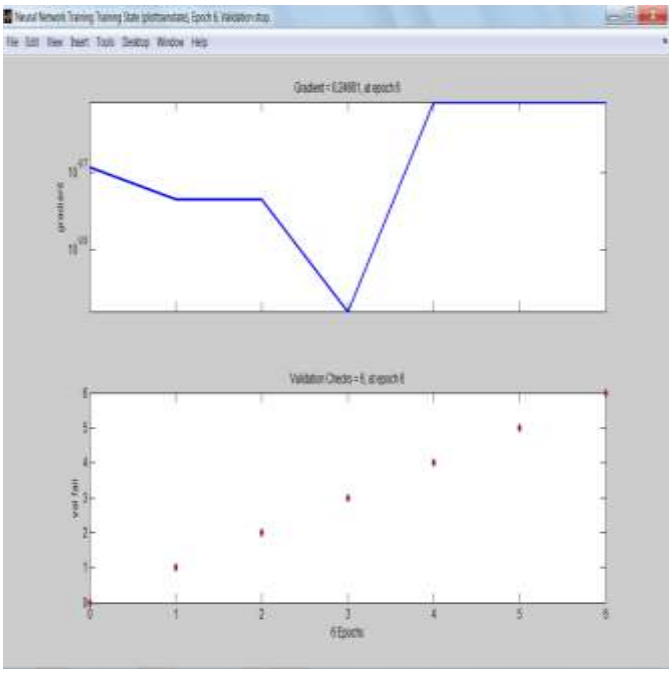

Fig: 3.1

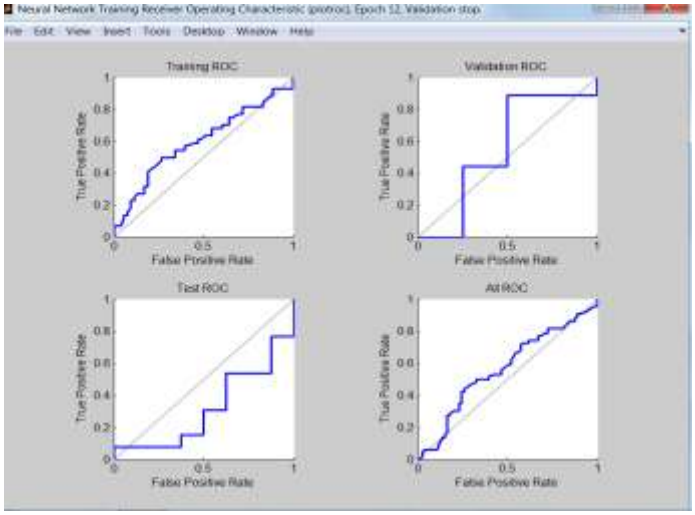

Fig: 3.2

6x139 double

	1	2	3	4	5	6
1	2	2	2	1	2	3
2	1	0	1	0	1	0
3	1	1	1	0	1	1
4	145	150	170	174	169	237
5	0	1	0	1	0	0
6	60	50	60	35	60	65
7						
8						
9						
10						

Fig: 3.3

IJARCCE

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 4, April 2017

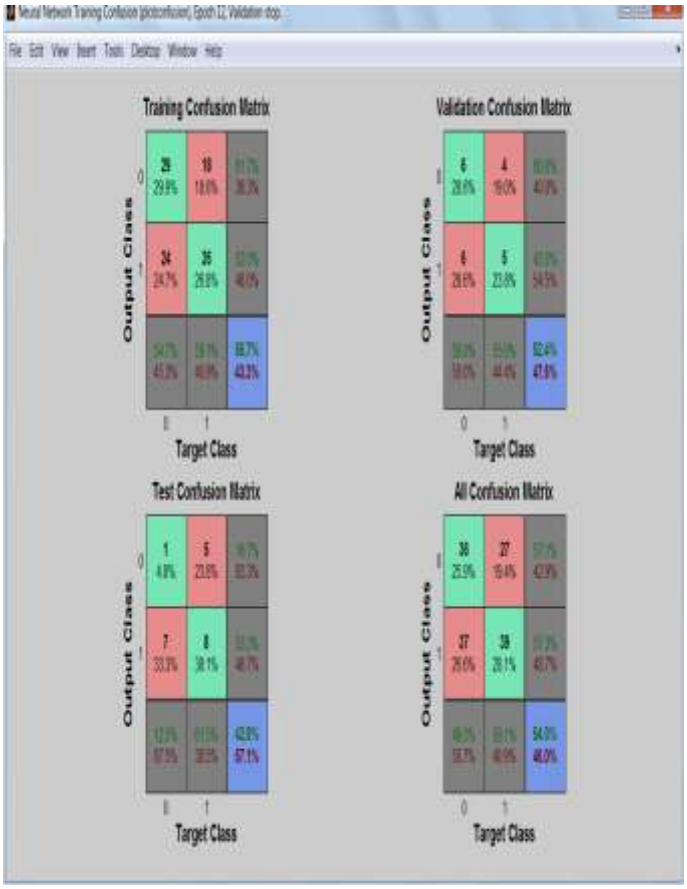

Fig: 3.4

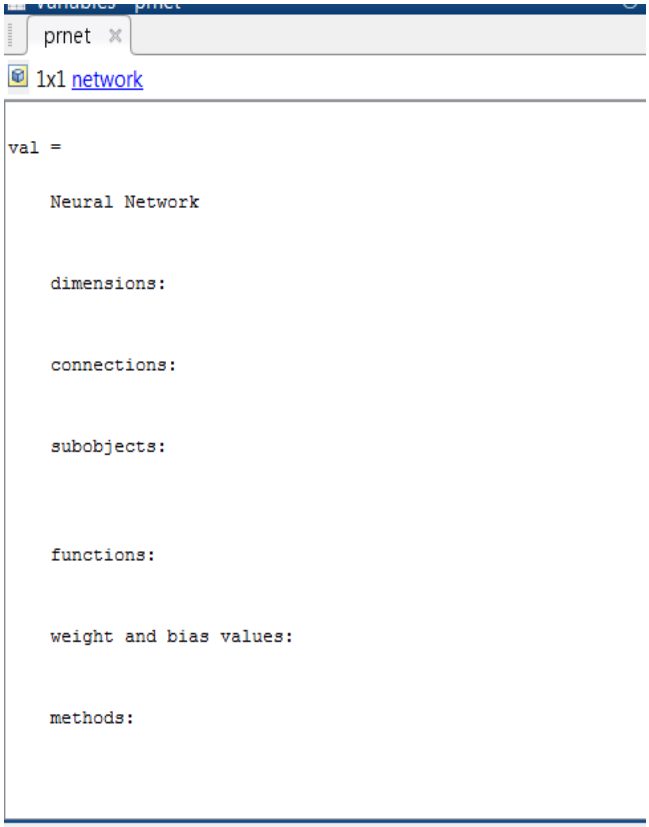

Fig: 3.5

ISSN (Online) 2278-1021
ISSN (Print) 2319 5940

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified
Vol. 6, Issue 4, April 2017

Fig 1 represents training of neural network. Fig 2 represents performance of neural network. It is based on epoch and mean square error values. If there is no large difference between train and test graphs then the output is proper else there will be an error. Fig 3.1 represents the neural network training state based on the performance based on gradient with epoch and gradient with the values in between 10^-7 to 10^-8. Fig 3.2 represents neural network training receiver operating characteristics(ROC) based on the validation, training, testing and all ROC. Fig 3.3 represents the separated input for training data. Fig 3.4 represents the confusion matrix. It gives values 56.7% as output. Fig 3.5 is used to store the variables.

V .CONCLUSION

The research undertook an experiment on application of various data mining algorithms to predict the heart attacks and to compare the best method of prediction. The research results do not presents a dramatic difference in the prediction when using Neural Network. The experiment can serve as an important tool for physicians to predict risky cases in the practice and advise accordingly. The model from the classification will be able to answer more complex queries in the prediction of heart attack diseases..

REFERENCES

[1] S.Florence1 , N.G.Bhuvaneswari Amma2 , G.Annapoorani3 , K.Malathi4, "Predicting the Risk of Heart Attacks using Neural Network and Decision Tree," International Journal of Innovative Research in Computer and Communication Engineering.
[2] HarshalYeole1 ,Sayali Ukirde2 , Sushma Khadse3 , Priyanka Pednekar4, "Prediction of Heart Disease Using BP-Neural Network & Genetic Algorithm," International Journal of Research in Advent Technology (E-ISSN: 2321-9637) Special Issue National Conference "NCPCI-2016", 19 March 2016.
[3] Dr. K. Usha Rani, "ANALYSIS OF HEART DISEASES DATASET USING N