Review on Heart Disease Prediction using Ann and Classifier

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Abstract— **The huge amount of information produced by the hospitals. In health care system there is large amount of data but poor in knowledge. The reason behind it is lack of effective analysis system to discover hidden relationship and data. Because of these data mining are used for the extracting and analyzing the knowledge. Numbers of data mining techniques are used like decision tree, Naïve Bayes, KNN, K-means, BP algorithm. But neural network is one of the most important techniques in data mining. In this paper we use the Intelligent Algorithm i.e. ANN (Artificial Neural Network). By using data mining techniques it takes less time for the prediction of the disease with more accuracy. Result from using neural networks is nearly 100% in paper [3].**

Keywords— Data mining, Heart disease, Artificial intelligence, Artificial neural network.

INTRODUCTION

Heart disease is one of the biggest causes for death from last some years. There are number of diseases occur, many problems occur while facing them. Recently computer technology as well as machine learning technology is used to develop the software for the doctors, which help to predict their decisions.
Data Mining: Is the extracting useful information from data. There are variety of tools & technology used in data mining. Number of terms like data classification, clustering, data integration, data regression for normalizing the data clustering or classification is used. Prediction of heart disease based on the patient's database. In Biomedical diagnosis the data mining plays an important role for predicting heart disease by using information regarding symptoms. Sometime physicians may not be able to diagnosis correctly hence because of this it is difficult to predict disease.

Artificial Intelligence**:** AI   is the branch of computer science concerned with making computers behave like humans. It has ability to make decision best on past experience or insufficient or conflicting information and the ability to understand the spoken language. An agent acts **intelligently** when

- It is flexible to changing environments and changing goals

- It learns from experience

I.   HEART DISEASE

Heart disease is the part of our body. Life depends on that. Heart simply pumps blood throughout the body. Now a day's a major task of healthcare association like hospitals, medical focuses are diagnosing the patients accurately. Clinical choices the doctor's experiences and the knowledge riched up to in database. Heart disease is the most challenging task for reducing patient's number. Heart disease has 2 risk factor:
1. Non-Modifiable: It's risk factor for heart disease like stroke, coronary heart disease, cardiovascular.
2. Modifiable: It's risk factor for heart disease like obesity, smoking, lack of exercise.
   Symptoms for Heart Disease:
   Extreme shortcoming nervousness.
   Sweating, unsteadiness.
   Non regular heart beats.

II.   RELATED WORK

In this section, Data mining techniques used for decision making in heart disease is analyzed.
Few research works has been carried out results for diagnosis of various diseases using data mining.

Sellappan et al. Propose Intelligent Heart Disease Prediction System Using Data Mining Techniques[1]using data mining techniques, namely, Decision Trees, Naïve Bayes and Neural Network. Results show that each technique has its unique strength in realizing the objectives of the defined mining goals. IHDPS can answer complex "what if" queries which traditional decision support systems cannot.
The IHDPS is user-friendly, web-based, scalable and reliable.

K. Srinivas et al. Propose Analysis of Coronary Heart Disease and Prediction of Heart Attack in Coal Mining Regions Using Data Mining Techniques [2].They have presented the effective heart disease prediction method using data mining techniques. Firstly, we have provided an efficient approach for the extraction of significant patterns from the heart disease data warehouses for the efficient prediction of heart attack Based on the calculated significant weightage, the frequent patterns having value greater than a predefined threshold were chosen for the valuable prediction of heart attack. It answers the complex queries.

A.Khemphila et al. propose Heart disease Classification using Neural Network and Feature Selection [3], which introduced the multi-layered perception and Back Propagation algorithm. Here use of information gain where the Neural network use for the classify the diagnosis of patients. It improves the classification accuracy. The output of this has attained an accuracy of training data set as 89.56% and validation data set as 80.99%.

M A. Jabbar et al. presented Classification of Heart Disease using Artificial Neural Network and Feature Subset Selection [4], introduced a classification approach which uses ANN and feature subset selection for the classification of heart disease. It is feasible and faster and more accurate for diagnosis of heart disease.

Dangare et al. Propose Improved Study of Heart Disease Prediction System using Data Mining Classification Techniques [5]. It used the multilayer perceptron neural network (MLPNN).This paper uses Neural Networks, Decision Trees, Naive Bayes. The system uses medical terms such as sex, blood pressure, cholesterol like 13 attributes to predict the likelihood of patient getting a Heart disease. But this paper added 2 more attributes they are obesity and smoking. From results conclusion is Neural network is more efficient.

III. ARTIFICIAL NEURAL NETWORK

Artificial neural network is used for complex and difficult tasks. Neural network is data mining tool used for classification & clustering. A neural network is typically a collection of neuron-like processing units with weighted connections between the units. There are two modes in artificial neural networks. First is activation transfer mode when activation is transmitted throughout the network and second is learning mode when the network organizes usually on the basis of the most recent activation Transfer.

There are two types of NN based on learning technique:
a) Supervised-output values are known beforehand (back propagation algorithm)
b) Unsupervised-output values are not known (clustering).
Basically in ANN there are 3 layers as follow:

1) INPUT LAYER: It accept the input bias values and pass to hidden layer by input layer this bias value is then multiplied by a weight and added to the sum that is going into the neuron.

2) HIDDEN LAYER: At each neuron in the hidden layer, a weight (wji) is multiplied to the value from each input neuron. Then a combined value uj is produced by adding the resulting weighted values from each hidden layer neuron. This weighted sum (uj) is then given to a transfer function ι, producing the outputs of value hj .The combined outputs obtained from the hidden layer neurons are then given to the neurons in output layer.

3) OUTPUT LAYER: In this layer weight (wkj) is multiplied to the value that is obtained from each hidden layer neuron, and then a combined value vj is produced by adding the resulting weighted values.
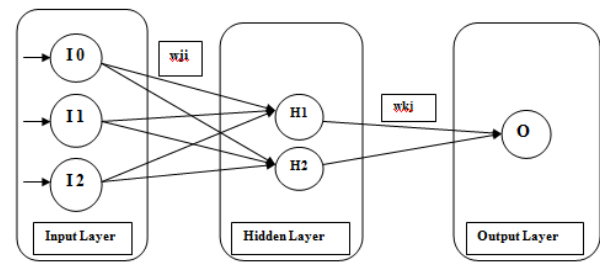

Fig.1: Artificial Neural Network

In above figure, hidden layer accepts data from the input layer. It uses input values and modifies them using some weight value, this new value is than send to the output layer but it will also be modified by some weight from connection between hidden and output layer. Output layer process information received from the hidden layer and produces an output. This output is than processed by activation function.
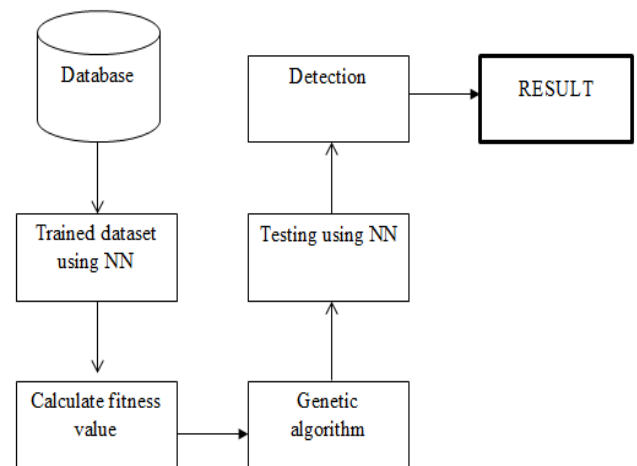
IV. EXISTING SYSTEM

Fig.2: Existing system architecture

Existing system used Genetic algorithm and NN. Genetic algorithm uses the two approaches: Crossover and Mutation. Here using the database first the data is trained using NN and then calculates the fitness value. The genetic algorithm is applied on that data and testing data set is formed.

V. PROPOSE SYSTEM

In Propose system we use the Artificial Intelligence. The Artificial Neural Network i.e. ANN is use to predict the heart disease by decision condition. In the existing system the main disadvantage is that it gives low accuracy in the results. Hence for increasing the accuracy we use the ANN. For normalizing the data set Data mining classifier is used.

CONCLUSION

Some Heart disease classification techniques are reviewed in this paper. From the analysis it is concluded that artificial neural network algorithm is best for classification of knowledge data from large amount of medical data. Good performance with increase in efficiency is obtained from neural network when provided with normalized data. The data is normalized using a classifier. It is supportive system to the doctor's decision. The Artificial neural network is one of the best for heart disease prediction.

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