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HEART ATTACK DETECTION AND HEART RATE MONITORING USING IOT

[1]Dol Sharayu, [2]Ghodake Pankaj, [3]Dolas Dnyaneshwari, [4]Gaikwad Vaishnavi, [5]Atul A. Joshi

[1]UG Scholar, Department Of E& TC, AVCOE, Sangamner, Dist- Ahmednagar, Maharashtra, India
[2]UG Scholar, Department Of E& TC, AVCOE, Sangamner, Dist- Ahmednagar, Maharashtra, India
[3]UG Scholar, Department Of E& TC, AVCOE, Sangamner, Dist- Ahmednagar, Maharashtra, India
[4]UG Scholar, Department Of E& TC, AVCOE, Sangamner, Dist- Ahmednagar, Maharashtra, India
pankajghodake52@gmail.com

ABSTRACT :- In today's modern world cardiovascular disease is the most lethal one. This disease attacks a person instantly that could make startling ramifications for the human existence. Thus, diagnosing patients accurately on time is the most difficult errand for the clinical society. The coronary illness treatment is very high and not reasonable by the majority of the patients especially in India. The research scope is to develop an early prediction treatment usingdata mining technologies.

Index Terms - Data Mining, Cardiovascular Disease (CVD), Heart Attack, Decision Tree, SVM, Smart-phone.

I. INTRODUCTION

Heart play's significant role in living organisms. Monitoring and Detection of heart related diseases require more precision, perfection and correctness [8]. As a little mistake can cause fatigue problem or death of the person. Health-care information systems tend to capture data in databases for research and analysis in order to assist in making clinical choices. Nowadays various individuals are losing their life because of respiratory failure. Coronary episode can happen when the progression of blood to heart is impeded. Inferable from late conclusion of respiratory failure we are deficient to save the existences of numerous people. In this framework, we propose a framework that will recognize coronary failure by observing the pulse in view of IoT (Internet of Things). For a solid grown-up, normal heartrate is 60 to 100 bpm (pulsates each moment). Competitors heart beat for the most part range from 40 to 60 bpm relying on their wellness [9]. On the off chance that an individual's pulse is continually north of 100 thumps each moment, the individual is supposed to have higher pulse which is likewise infamous as tachyarrhythmia. It can diminution the efficiency of heart by letdown the amount of blood pumped through the body can result in chest pain and lightheadedness. With the advancement in technology, it iseasy to monitor the patient's heart rate even at home. IoT is dexterity of network mechanism to intellect and gather information from world ubiquitously us then share the information athwart internet anywhere it can be managed for some tenacity.

II. LITERATURE REVIEW

Abhishek Ta, "Heart Disease Prediction System Using Data Mining Techniques" In this study, the aim was to design a predictive model for heart disease detection using data mining techniques from Transthoracic Echocardiography Report dataset that is capable of enhancing the reliability of heart disease diagnosis using echocardiography [1]. Sellappan Palaniappan, Rafiah Awang "Intelligent Heart Disease Prediction System Using Data Mining Techniques" A prototype heart disease prediction system is developed using three data mining

classification modeling techniques. The system extracts hidden knowledge from a historical heart disease database. DMX query language and functions are used to build and access the models. The models are trained and validated against a test dataset. Lift Chart and Classification Matrix methods are used to evaluate the effectiveness of the models. All three models are able to extract patterns in response to the predictable state. The most effective model to predict patients with heart disease appears to be Naive Bayes followed by Neural Network and Decision Trees [2].

Aditya Methaila, Prince Kansal,"EARLY HEART DISEASE PREDICTION USING DATA MINING TECHNIQUES " In this paper the focus is on using different algorithms and combinations of several target attributes for effective heart attack prediction using data mining. Decision Tree has outperformed with 99.62% accuracy by using 15 attributes. Also, the accuracy of the Decision Tree and Bayesian Classification further improves after applying genetic algorithm to reduce the actual data size to get the optimal subset of attribute sufficient for heart disease prediction. Association classification technique apriori algorithm, was along with a new algorithm MAFIA was used. Straight Apriori-based algorithms count all of the 2k subsets of each k-item set they discover, and thus do not scale for long item sets. They use look ahead to reduce the number of item sets to be counted. MAFIA is an improvement when the item sets in the database are very long [3]. 4. S. Kiruthika Devi, S. Krishnapriya and Dristipona Kalita"Prediction of Heart Disease using Data Mining Techniques" The accuracyof the algorithms used in each technique can be enhanced by hybridizing or combining algorithms to a single algorithm which may not be accurate for weakly classified sets of data, and is expected to make quicker and moreprecise decisions[4].

M.Lavanya, Mrs.P.M.Gomathi, "Prediction of Heart Disease using Classification Algorithms" Medical related information are huge in nature and it can be derived from different birthplaces which are not entirely applicable in feature. The research undertook an experience on application of varies data mining algorithm to predict the heart attacks and to compare the based method of prediction. The predictive accuracy determined by J48, REPTREE, nave bayes, neural networks, CART. The overall objective is to study the various data mining techniques available to predict the heart [5] Hlaudi Daniel Masethe, Mosima Anna Masethe, "Prediction of Heart Disease using Classification Algorithms" 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 present a dramatic difference in the prediction when using different classification algorithms in data mining. 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. The predictive accuracy determined by J48, REPTREE and SIMPLE CART algorithms suggests that parameters used are reliable indicators to predict the presence of heart diseases [6].

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III. METHODOLOGY

Now it is the time to articulate the research work with ideas gathered in above steps by adopting any of below suitable approaches:

A. Block Diagram

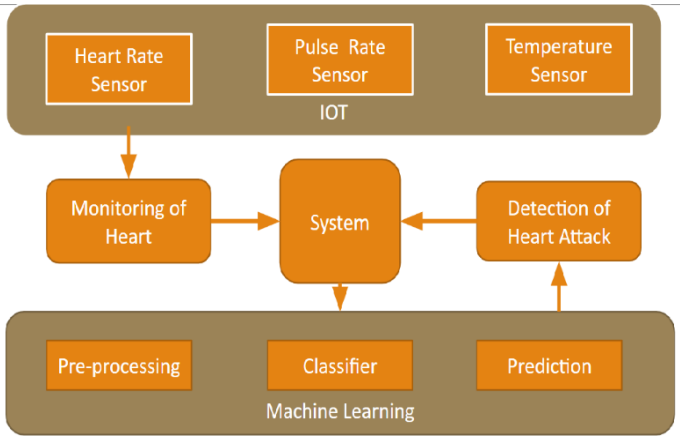

Fig 1: Block Diagram

B. *Block Diagram Description*

1. Arduino: Arduino is the center hardware where the other component are connected.
2. Router: It is used to collect the data through Arduino kit and sends to the remote devices e.g: Smart phone, Tablet, PC etc.
3. Heart Rate Sensor: It is used to monitor heart rate of Heart. An optical heart rate sensor measures pulse waves, which are changes in the volume of a blood vessel that occur when the heart pumps blood. Pulse waves are detected by measuring the change in volume using an optical sensor and green.
4. Temperature Sensor: Temperature sensor is used for temperature. The sensor is calibrated and easy to interface with the microcontrollers. The sensor can measure temperature from 0C to 50C
5. Pulse Rate Sensor: It is used to collect information related to pulse rate.
6. Preprocessing: Data is collected from sensors and pre processed
7. Classifier: Classifier such as SVM is used for classification
8. Prediction: Prediction related to heart disease is done on model implemented in classifier.
9. Detection: Detection of Heart Attack is Predicted through prediction model.

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C.Circuit Diagram:

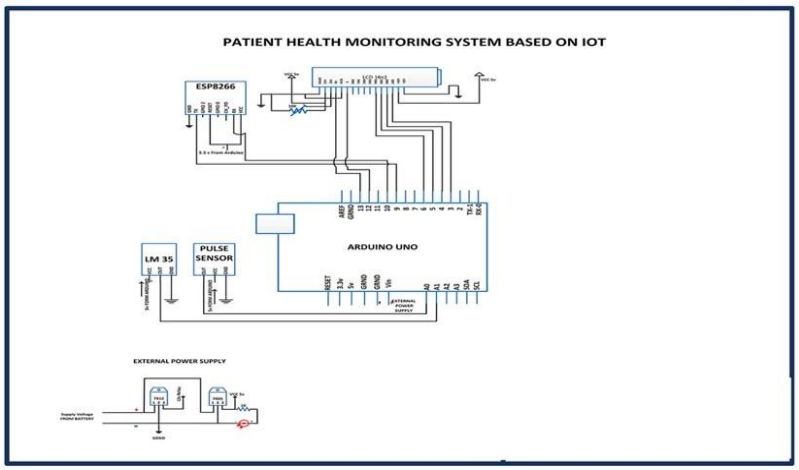

Fig 2: Circuit Diagram

D. Algorithm Support Vector Machine(SVM):

SVM is a supervised machine learning algorithm used for both classification and regression. The objective of SVM algorithm is to find a hyperplane in an N-dimensional space that distinctly classifies the data points. The dimension of the hyperplane depends upon the number of features.

Pseudo Code

Input: D dataset, on-demand features, aggregation-based features,

Output: Classification of Application

for each application App-id in D do

Get on-demand features and stored on vector x for App-id

x.add (Get-Features(app-id));

end for

for each application in x vector do

Fetch first feature and stored in b, and other features in w.

hw,b (x) = g (z) here z= (wT x + b)

if (z ≥0)

assign g(z)=1;

else g(z)=-1;

end if

end for

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E. Flowchart:

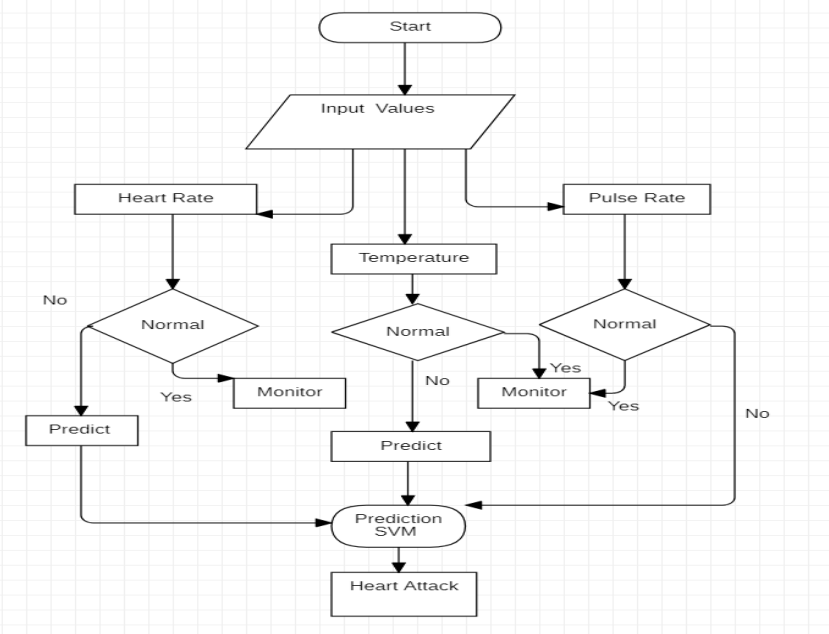

Fig 3: Flowchart

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IV. RESULTS AND DISCUSSIONS

A) EXPERIMENTAL SETUP

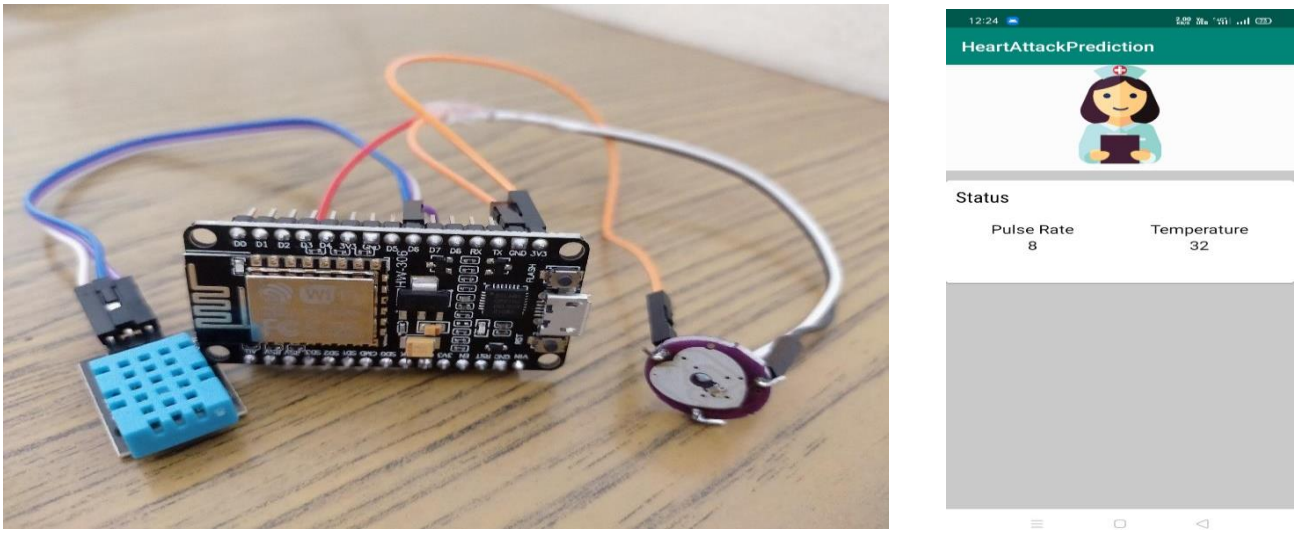

Fig 4: Experimental Setup and Application Reading of values

The system shows DHT11 sensor for temperature reading, Pulse rate sensor and Node MCU for inputting values for heart prediction. The values are seen in application.

B) Application Results

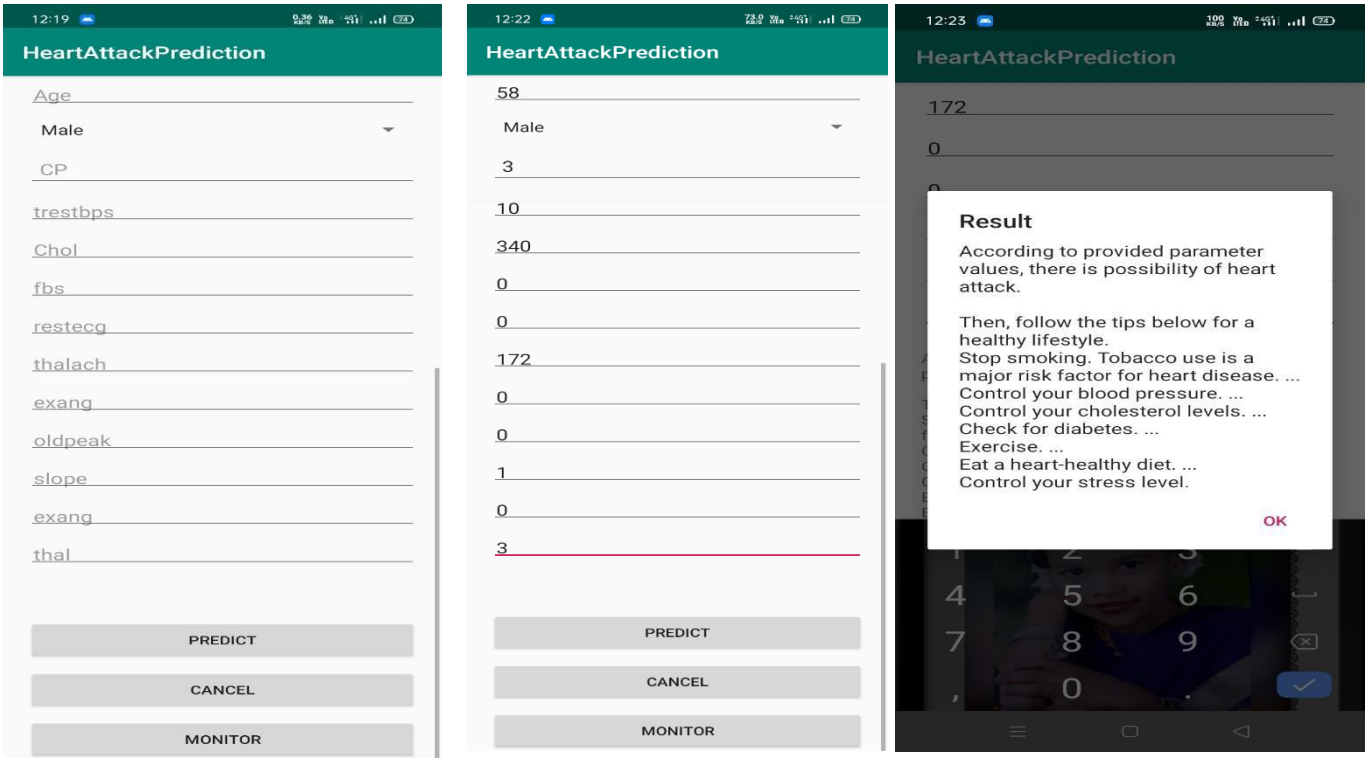

Fig 5 - Parameters are input and prediction of Heart Attack is evaluated

V. CONCLUSION

The symptoms of heart disease are familiar for everyone. But no one can predict when it may happen and also the prediction won't give any occurrence status for example typical or unusual. Our exploration intension is to inform the patients that neither typical nor unusual at its beginning phase. The utilization of information mining calculations shows it better execution results among themselves. This application will should foresee the cardiovascular failure from the chest torment at a beginning phase and guide the person to take treatment early such as to get their ECG done as early as possible and get evaluated from a doctor to make diagnoses of heart attack.

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