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IOT Based Heart Disease Prediction

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ABSTRACT: In today's modern world cardiovascular disease is the most lethal one. This disease attacks a person so instantly that it hardly gets any time to get treated with. So diagnosing patients correctly on timely basis is the most challenging task for the medical fraternity. A wrong diagnosis by the hospital leads to earn a bad name and losing reputation. At the same time treatment of the said disease is quite high and not affordable by most of the patients particularly in India. The purpose of this paper is to develop a cost effective treatment using data mining technologies for facilitating data base decision support system. Almost all the hospitals use some hospital management system to manage healthcare in patients. Unfortunately most of the systems rarely use the huge clinical data where vital information is hidden. As these systems create huge amount of data in varied forms but this data is seldom visited and remain untapped. So, in this direction lots of efforts are required to make intelligent decisions. The diagnosis of this disease using different features or symptoms is a complex activity. In this paper using varied data mining technologies an attempt is made to assist in the diagnosis of the disease in question.

KEYWORDS: cardiovascular disease, data mining, intelligent decisions, symptoms

I. INTRODUCTION

Today, many hospitals manage healthcare data using healthcare information system; as the system contains huge amount of data, used to extract hidden information for making intelligent medical diagnosis. The value of machine learning in healthcare is its ability to process huge datasets beyond the scope of human capability, and then reliably convert analysis of that data into clinical insights that aid physicians in planning and providing care, ultimately leading to better outcomes, lower costs of care, The main objective of this research is to build Intelligent Heart Disease Prediction System that gives diagnosis of heart disease using historical heart database. 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. The data mining classification techniques viz. Neural Networks, Decision Trees, Random Forest, and Naive Bayes are used.

The healthcare industry collects huge amounts of healthcare data which, unfortunately, are not "mined" to discover hidden information for effective decision making. Discovery of hidden patterns and relationships often goes unexploited. Advanced data mining techniques can help remedy this situation. This research has developed a prototype Intelligent Heart Disease Prediction System (IHDPS) 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. Using medical profiles such as age, sex, blood pressure and blood sugar it can predict the likelihood of patients getting a heart disease. It enables significant knowledge, e.g. patterns, relationships between medical factors related to heart disease, to be established. IHDPS is -based, user-friendly, scalable, reliable and expandable. It is implemented on the Java-Python platform by using Random Forest Algo.

II. LITERATURE SURVEY

Very few systems use the available clinical data for prediction purposes and even if they do, they are restricted by the large number of association rules that apply. Diagnosis of the condition solely depends upon the Doctors' intuition and patient's records. Detection is not possible at an earlier stage.

In the existing system, practical use of various collected data is time consuming. There are only few decision support systems available in medical industry whose functionalities are very limited. As mentioned earlier, medical

decisions are made with doctor’s intuition and not from the rich data from the medical database. Wrong treatment due to misdiagnosis causes serious threat in medical field. In order to solve these issues data mining solution was with help of medical databases was introduced.

The leading cause for mortality and morbidity is cardiovascular disease

[1]. Ahmed M. Alaa[2] et.al proposed machine learning techniques for Cardiovascular disease risk prediction. But they achieved maximum accuracy of 77%. As the dataset is unbalanced, there is a need to apply sampling techniques. But they directly applied Machine learning models on the dataset. Stephen F. Weng[3] et.al studied application of machine learning algorithms to improve cardiovascular risk prediction. They shown that Machine-learning algorithms are successful in improving accuracy of cardiovascular risk prediction, but the required number of patient records must be more to achieve better results. Rine Nakanishi [4] et.al evaluated ML methods for improving the prediction rate of coronary heart disease (CHD). They applied machine learning approaches on 6814 patient records and achieved good accuracy rate. Senthilkumar Mohan[6] proposed a machine learning model that finds significant features for improving the prediction rate of cardiovascular disease. They tried with various combinations of features and achieved an accuracy of 88.7% with hybrid random forest.

III. PROPOSED SYSTEM

The proposed system have eminence of detecting heart attack with help of observing heart rate based on internet of thing. Our method uses a pulse sensor, Arduino board and a Wi-Fi module. After setting up the system, the pulse sensor will start sensing heart rate readings and will display the heartbeat of person on LCD screen. Also, with the use of Wi-Fi module it will transmit the data over internet. System allows a set point which can help in determining whether a person is healthy or not by checking his/her heartbeat and comparing it with set point. After setting these limits, the system will start monitoring the heart rate of patient and immediately the heart rate goes above or below the certain limit the system will send an alert message. As a part of this project we are implementing an android application model that will track the heartbeat of particular patient and monitor it correctly and give the emergency message on chances of heart attack

IV. RESULT



The screenshot shows the application interface. At the top, there are tabs for 'Instructions', 'Take Test', and 'My Report'. Below this is a section titled 'Guidelines for using Heart Care+' with two columns: 'DESCRIPTION OF INPUTS TO BE ENTERED BY USER' and 'TESTS FOR HEART DIAGNOSIS'. The 'DESCRIPTION' column lists 11-14 items related to ECG and heart rate. The 'TESTS' column lists 'BLOOD TEST', 'ECG TEST', and 'STRESS TEST' with a corresponding image of a person's arm being tested. Below the guidelines is a form titled 'Please enter the details below to predict your heart health:'. The form contains several input fields: Name (dhs), Chest Pain Type (Typical Ang...), Thallium test result (Reversible d...), Sex (Male/Female), Maximum Heart Rate achieved in stress test (232), Slope of the peak exercise ST segment (Flat), Age (80), Resting ECG results (Normal), Number of major vessels colored by fluoroscopy (3), Cholesterol (300), Resting Blood Pressure (231), ST depression induced by exercise relative to rest (133), and a question 'Is your Fasting Blood Sugar greater than 200?' with 'Yes' selected. There are 'Clear', 'Get Result!', and 'Exit' buttons. At the bottom, a green box displays the result: 'Your heart disease diagnosis result is: NEGATIVE. You have no blockage or less than than 50% diameter narrowing due to blockage in atleast one of your major blood vessels. 75% of the cases support your diagnosis. Please note down your id for providing feedback: 74'.

Fig 1: homepage

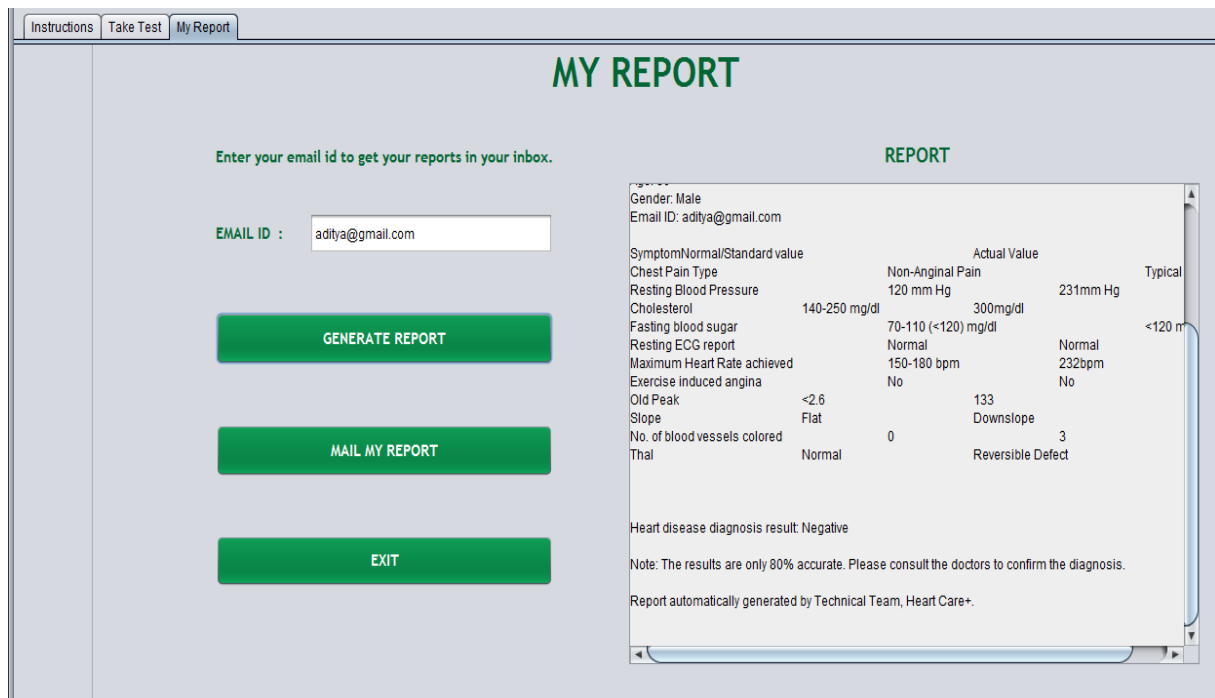


Fig 2.Report

V. CONCLUSION

In this exploration we have attempted to propose a total paper on detecting heart attack by monitoring the heartbeat of person. The heart beat sensor which is interfaced with microcontroller senses the heartbeat of person and transmits them over internet using Wi-Fi module. System allows setting limits of heart beat. After setting these limits person can start monitoring the heart beat and whenever the person's heart beat goes above certain set point they can get an alert on high heart beat and also about chances of heart attack. Also the system alerts for lower heart beat.

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