

Review Paper on Effective heart disease prediction System

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Abstract: A variety of factors influence each person's health, and some disorders are fatal. Heart disease is an important condition that affects people of all ages. A pre-processing strategy is proposed in this study to increase the accuracy of various ECG signals. ECG Sensors are used in a healthcare monitoring system that we propose. The ECG sensors, which are essential for remote patient monitoring, detect the values that are of substantial importance. A smartphone app is used to continually monitor the patient's ECG, and various data extraction techniques are applied to the ECG wave to extract properties that can be utilised to accurately predict heart problems. The many methods used in data mining

Keywords: Pulse sensor, ECG sensor, ESP-32 controller, Arduino suite, Embedded C, Python, IOT.

INTRODUCTION

Health is regarded as a blessing that relies on proper care and several elements. Many cultures developed for a few centuries and perished away. Disorder and deterioration surpassed them. Our societies are not free from health diseases. This current lifestyle has an impact on health disorder which is rising day by day. Among all other health disorders, heart disease is now a major crisis as many individuals are losing their lives who are suffering from heart disease. Internet of Things (IoT) has become an essential part of human life and it is used in all fields such as education, business, finance, social networking, and healthcare, etc. The healthcare industry has been adopting new technology for providing better and smart healthcare structures. With the IoT, remote and real-time monitoring of patients is made possible and this unleashes the potential to continuously monitor the health and helps the physicians to give suggestions or treat promptly. As an enormous community of people is suffering from heart disease, it is vital to carry out diagnosis at the early stage to save lives and help to support a healthy lifestyle of people. Health care monitoring has enhanced tremendously due to the result of different IoT qualifications and instruments to track patient's health requirements regularly.

The patients can also interact with the physician more efficiently which provides the pleasure of therapy and it also decreases the hospital stay and healthcare expenditures. The main focus of employing IoT in the healthcare system is to set up a fully automated environment for patient monitoring and providing assistance and care to patients in real-time. There is a rise in the need for a portable system that can be used at home by the patient for measuring their ECG profiles and diagnosing their disorder in real-time. So, in this, an extensive review is carried out to find the existing technologies that are available for monitoring heart-related diseases. It is comprehended from the analysis that the accumulated raw data includes noise and irrelevant contents. These are irrelevant and inaccurate data that are not helpful for diagnosis. This noise and a huge interpretation in data lead to a decrease in classification accuracy, sensitiveness, and accuracy. Therefore, in this paper, a novel pre-processing approach is used to remove noise and unrelated data from ECG signals.

Relevant attributes are identified utilizing correlation techniques to improve data efficiency. The machine learning classifier algorithms such as KNN, naïve Bayes, and Decision tree are used for classifying the ECG signals based on waveforms. The classifier that obtains better performance metrics can be used for diagnosing the variation in the ECG waveform and identifying the type of abnormality and disorders. Machine Learning is used across many spheres around the world. The healthcare industry is no exception. Machine Learning can play an essential role in predicting the presence/absence of Locomotor disorders, heart diseases, and more. Such information, if predicted well in advance, can furnish vital insights to doctors who can then adapt their diagnosis and treatment per-patient basis.

LITERATURE SURVEY

[1] Early Prediction of Heart Disease Using PCA and Hybrid Genetic Algorithm with k-Means ByMd. Touhidul Islam, Sanjida Reza Rafa, Md. GolamKibria. The most important aspects of this implementation are to detect heart disease at an early stage. The k-means procedure is used for bunching the data. This type of clustering can get stuck in the local optima. use of Hybrid Genetic Algorithm (HGA) for data clustering to avoid this problem. This proposed technique can indicate early heart disease with an accuracy of 94.06%. This procedure reduces the dimensionality of the dataset using PCA and combined the unsupervised heuristic k-means algorithm with metaheuristic Genetic Algorithms for better combinatorial optimization.

[2] Heart Disease Prediction using Hybrid Machine Learning Model"ByDr. M. Kavitha , G. Gnaneswar, R. Dinesh, Y. RohitSai, R. SaiSuraj. This approach used the Cleveland heart disease dataset, and data mining methods such as deterioration and category are used. Machine learning methods Random Forest and Decision Tree are involved. The outcome shows an accuracy level of 88.7% through the heart disease prediction model with the hybrid model. The interface is designed to get the user's input parameter to indicate the heart disease, for which we used a hybrid model of Decision Tree and Random Forest.

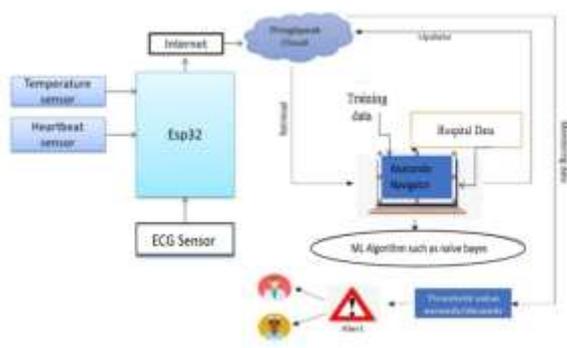
[3] Predicting Heart Disease at Early Stages using Machine LearningBy Rahul Katarya, PolipireddySrinivas. Machine learning

shows influential outcomes in making decisions and prognoses from the broad set of data constructed by the healthcare industry. Some of the supervised machine learning methods used in this prediction of heart disease are artificial neural network (ANN), decision tree (DT), random forest (RF), support vector machine (SVM), naïve Bayes (NB) and k nearest neighbor algorithm. Similarly, the interpretations of these algorithms are summarized. It will be useful for the doctor to diagnose the patients efficiently.

[4] Prediction of Heart Disease using Machine Learning Algorithms” By Garima Choudhary, Dr.Shailendra Narayan Singh. This technique has been made for heart sickness for all age group sufferers with the help of machine learning algorithms. A decision tree algorithm has been used to make the predictions whether an individual has heart sickness or not followed by the Ada-Boost algorithm. Among the applied classifiers the importance of elements has been recognized.

[5] Heart Disease Prediction using Machine Learning” By Apurb Rajdhan, Avi Agarwal, Dr.Poonam Ghule, MilanSai, Dundigalla Ravi. The suggested work indicates the possibilities of Heart Disease and classifies patients' risk levels by executing different data mining techniques such as Naive Bayes, Decision Tree, Logistic Regression, and Random Forest. The test results demonstrate that the Random Forest algorithm has reached the highest accuracy of 90.16% corresponding to other ML algorithms executed.

III. BLOCK DIAGRAM



These sensors are attached to the ESP-32 microcontroller to collect the heartbeat rate and ECG signals. The different readings of the patient’s vital signs are gathered and sent for testing by the classifier model which is using the dataset for detecting the abnormalities. The essential concept behind the suggested method is to improve the pre-processing of ECG data. The suggested model has two main steps: Pre-processing and classification of heart disease data. The data collected from sensors will be sent to the machine learning module for further analysis. The Project aims at using various machine learning algorithms like Naive Bayes for predicting and organizing arrhythmia into different categories. Experimented with two different filter element selection methods. One of the reasons for using fewer elements was the limited number of data records(452)comparedto257 features. This helps in avoiding overfitting and also gives insight into the important features which have a maximum correlation with the output labels but minimal correlation among themselves. In the foremost procedure, we discretized all the continuous-valued columns and then computed the mutual information(Y, X)between each segment and the outcome label vector using the below formula.

The second method was to utilize a MatLab feature selection package named mRMRTThis method selects the components which have both maximum correlations with the output labels and minimum correlation among themselves

IV. ALGORITHM

Machine Learning can help with a variety of healthcare issues. The Naive Bayes algorithm is a machine learning technology that aids in the diagnosis of heart disease patients. This research examines a few parameters and predicts heart disease, resulting in the development of a heart disease prediction system (HDPS) based on data mining techniques. When the dimensionality of the inputs is high, the Naive Bayes Classifier approach is used. Naive Bayes can often outperform more advanced classification systems, despite its simplicity. The naive Bayes model recognises the characteristics of heart disease patients. It depicts the likelihood of each input attribute for the predictable state.

Many machine learning and data mining approaches are built on the foundation of Naive Bayes or Bayes' Rule. To generate models, the rule (algorithm) is employed.

V. OBJECTIVES

1. To design an IoT method that could continuously read the health data like Temperature, ECG, and Pulse rate of the Person.
2. To develop a method to robustly classify an ECG trace into one of 13 broad arrhythmia classes.
3. Using machine learning algorithms to determine heart disease. Categorize the specific name by using the classifiers.

VI. REFERENCES

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