IJIRCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 11, Issue 5, May 2023

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 8.379

International Journal of Innovative Research in Computer and Communication Engineering

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 5, May 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1105164|

Heart Diseases Prediction using Machine learning

Sunanda Dere, Shweta Bhosale, Isha Bhingare, Kajal Kinhale, Prof. S. B. Shirke

Department of Computer Engineering, Shri Chhatrapati Shivajiraje College of Engineering, Maharashtra, India

ABSTRACT: Heart Disease forecast is treated as most confounded task in the field of medical sciences. In addition to identifying heart problems, the decision support system could also recommend personalized emotional support strategies for patients. This could include connecting patients with supportive social networks, recommending lifestyle changes, and providing access to mental health resources. Today clinical field have made considerable progress to treat patients with different sort of infections. To accomplish a right and practical treatment and emotionally supportive networks can be created to settle on great choice. Numerous emergency clinics use clinic data frameworks to deal with their medical services or patient information. These frameworks produce gigantic measures of information as pictures, text, outlines and numbers. Tragically, this information is seldom used to help the medical growth. There is a greater part of concealed data in this information that isn't yet investigated which offer ascent to a significant inquiry of how to make valuable data out of the information. So there is need of making an incredible venture which will assist experts with anticipating the heart issues before it happens. The principle objective of this paper is to build up a model which can decide and extricate obscure information related with heart problems from a past heart information base record. It can tackle muddled questions for recognizing heart disease and subsequently help clinical experts to settle on savvy clinical decision.

KEYWORDS*:* Machine learning, prediction Model, heart disease prediction, classification algorithms, heart disease.

I. INTRODUCTION

Acute myocardial infarction is frequently called a respiratory failure and is the most widely recognized reason for abrupt passing in urban and country regions. Ideal recognition of a coronary failure is vital on the grounds that deferred expectations can make serious harm the heart muscle, called cardiomyopathy, which can prompt bleakness and passing.

At the point when cell phones become one of the most broadly utilized advances today, building up an application for anticipating a coronary episode will deliver productive outcomes in diagnosing somebody who has endured a chest pain. This will lead to an early prediction of a heart attack, which will lead to doctors' early diagnosis and treatment as well as early treatment. Chest pain is the most common and obvious symptom of a heart attack, although some other characteristics can easily cause a heart attack.

II. RELATED WORK

M. A. Jabbar et.al, [1] proposed another method of applying affiliation management procedures in the medical field to find heart disease predictions. The human service industry collects a large amount of medical service data. Unfortunately, these services have not been tapped to find successful enveloped data. Choose hidden examples and find that hidden examples and relationship softening have not been fully utilized. Information mining strategies can help solve this problem. Data mining has discovered various applications in business and science. Affiliation rules, arrangements, and aggregation are important areas of passion for information mining.

M. Akhiljabbar et.al, [3] proposed using KNN with genetic programs to achieve a strong order in predicting coronary heart disease. KNN is a well-known and efficient classifier that works by identifying the category of a given data point based on the category of its nearest neighbors. The use of genetic programs to improve KNN's performance is an interesting approach, as genetic algorithms are able to perform global searches in complex and multi-modal scenarios. By combining KNN with genetic programs, it may be possible to achieve more accurate and robust predictions of coronary heart disease. However, as mentioned earlier, the accuracy of grouping results depends on the careful selection of relevant attributes and feature engineering. It's also important to ensure that the algorithm is trained on a diverse and representative sample of the population to avoid biases in the predictions.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 5, May 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1105164|

Chaitrali S Dangare [4] it's interesting to hear about the work that examines the prediction of heart disease using progressive information quality. It seems that the study uses clinical terms such as gender, circulatory system strain, cholesterol, and 13 other attributes to predict the likelihood of patients suffering from heart disease. The inclusion of additional features such as robustness and smoking is also notable.

The use of data mining techniques such as decision trees, naive Bayes, and neural networks to predict heart disease is a common approach. These techniques are able to analyze large amounts of data and identify patterns and relationships that may not be easily discernible to humans.

Zeinab Arabasadi et.al, [5] proposed a high-precision hybrid method for diagnosing coronary artery disease. It's interesting to hear that the proposed method is able to increase the efficiency of neural networks by using a genetic algorithm to optimize the initial weights.

Amma, N.G.B [7] proposed that medical diagnostic systems undertake important work in clinical practice and are used by clinical professionals for analysis and treatment. In this work, the clinical estimation system is portrayed by the normal danger of heart infection. This structure works by consolidating genetic programs with the general preferences of the sensory system. The multi-layer feedforward neural system has been specially adjusted for complex layout problems. The load of the nervous system can be solved by genetic methods because it can find an acceptable load arrangement in fewer cycles.

Saba Bashir et.al, [8] Data science has been widely used in the medical field, including in the prediction of heart disease. With the help of machine learning algorithms and statistical models, data scientists have been able to analyze large volumes of data related to heart disease and develop models that can predict the likelihood of a patient developing the condition.
One of the key challenges in predicting heart disease accurately is the selection of relevant features or variables. There are numerous risk factors associated with heart disease, such as age, gender, family history, cholesterol levels, blood pressure, smoking status, and diabetes. Determining which factors are most important for predicting heart disease is a complex task that requires careful analysis of large data sets.
To improve the accuracy of heart disease prediction models, researchers have developed various feature selection techniques that can identify the most important variables. Some of the most commonly used techniques include correlation-based feature selection, mutual information-based feature selection, and recursive feature elimination.

In addition to feature selection techniques, researchers have also developed various machine learning algorithms that can accurately predict heart disease. These algorithms include decision trees, logistic regression, support vector machines, random forests, and artificial neural networks. By comparing the performance of different algorithms on multiple data sets, researchers can identify the most effective algorithm for predicting heart disease.

Overall, data science has the potential to revolutionize the field of cardiology by improving the accuracy of heart disease prediction and enabling more personalized treatment plans. However, continued research and development are necessary to refine and improve the current models and algorithms.

III. PROPOSED SYSTEM

It's great to hear about your proposed heart attack prediction mechanism that incorporates deep feature learning and training. It sounds like you have evaluated the performance of It's true that medical diagnostic systems can play an important role in clinical practice, providing valuable information to healthcare professionals for analysis and treatment. your approach and found it to be superior to other classifiers when using all attributes and the same training sample.

If your results show statistical significance, this suggests that the performance improvement you observed is not due to chance and is instead likely to be a real effect. This is an important finding and indicates that your approach has the potential to be a valuable tool for predicting heart attacks.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 5, May 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1105164|

Since the samples are not enough to learn the precise mapping between features and category labels, using low population, high-dimensional data sets to predict heart attacks is challenging. Current literature usually accomplishes this task by manually creating and selecting features. Compared with other technologies, it is found that random forest can identify the basic structure of the data.

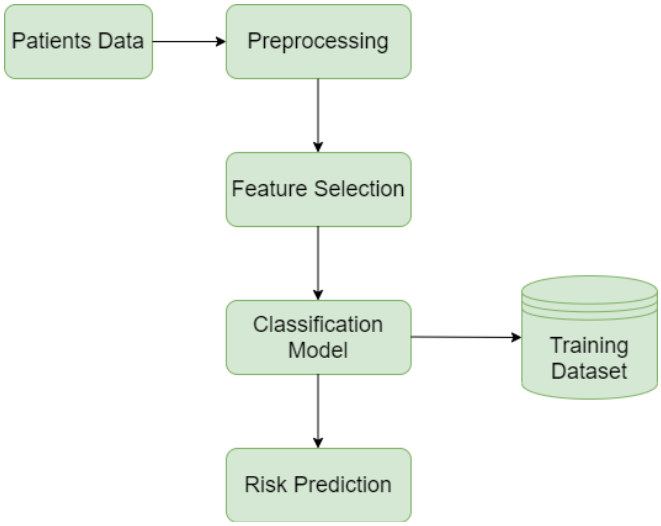


Figure 1. System Architecture

Algorithm:

Input:

Step 1: Upload dataset.
Step 2: Symptoms is the set of input attributes.
Step 3: Heart disease prediction is the set of output attributes.
Step 4: sample is a set of training data
Function Iterative Dichotomies returns a decision tree.

1. Create root node for the tree.
2. If (all inputs are positive, return leaf node positive)
   If Else (if all inputs are negative, return leaf node negative)
   Else (Some inputs are positive and some inputs are negative, check condition (Positive>negative||Positive<negative), then return result)
3. Calculate the entropy of current state H(S)
4. For each attribute, calculate the entropy with respect to the attribute 'X' denoted by H(S,X)
5. Select the attribute which has maximum value of IG(S,X)
6. Remove the attribute that offers highest value from the set of attributes
7. Repeat until we run out of all attributes or the decision tree has all leaf nodes.

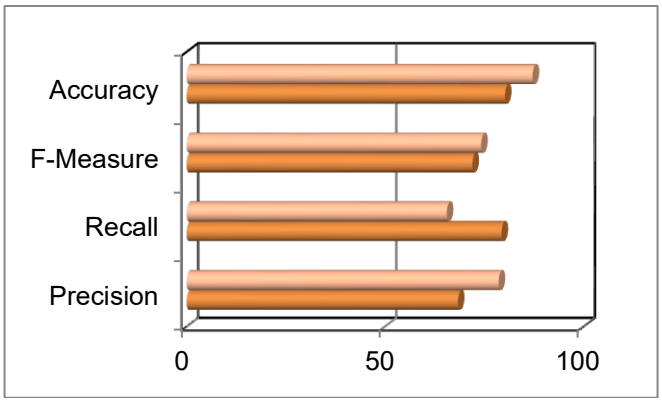
IV. RESULT AND DISCUSSION

We compared the prediction accuracy of the proposed heart disease on the number of samples and showed the result graphically. Let see the following graph and table shows the Heart disease prediction accuracy result based on decision tree classification technique.

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 8.379 |

|| Volume 11, Issue 5, May 2023 ||

| DOI: 10.15680/IJIRCCE.2023.1105164|



	Existing System	Proposed System
Precision	68.45	77.70
Recall	79.44	65.64
F-Measure	72.11	74.31
Accuracy	80.29	88.26

V. CONCLUSION

Overall, introducing a new methodology for grouping coronary heart disease has the potential to improve our understanding of this complex disease and lead to more effective treatments and prevention strategies. Train informational collections taken from UCI Repository. Our methodology utilizes Naive Bayes and Random Forest techniques which are aggressive techniques for classification. This predictive model can help doctors perform an effective heart disease diagnosis process with fewer attributes. Coronary heart disease is indeed one of the leading causes of mortality not only in India but also worldwide. Distinguishing proof of significant hazard factors and creating choice emotionally supportive network, and successful control measures and wellbeing instruction projects will decrease in the coronary illness mortality.

REFERENCES

[1] M. A. Jabbar, B.L Deekshatulu, Priti Chandra, “An evolutionary algorithm for heart disease prediction” CCIS, PP 378-389, Springer (2012).
[2]Ms.M.C.S.Geetha, Dr.I.ElizabethShanthi, Ms.N. SanfiaSehnaz,” The paper "Analyzing the Suitability Of Relevant Classification Techniques On Medical Data Set For Better Prediction" presented at the International Conference on I-SMAC in 2017.
[3]M.AkhiljabbarB.LDeekshatuluaPriti Chandra International “Classification of Heart Disease Using K- Nearest Neighbor and Genetic Algorithm” Conferenceon Computational Intelligence: Modeling Techniques and Applications (CIMTA) 2013.
[4] Chaitrali S Dangare “Improved Study Of Heart Disease Prediction System Using Data Mining Classification Techniques”, International Journal Of Computer Applications, Vol.47, No.10 (June 2012).
[5]ZeinabArabasadi, RoohallahAlizadehsani, MohamadRoshanzamir, HosseinMoosaei, Ali AsgharYarifard “Computer aided decision making for heart disease detection using hybrid neural network-Genetic algorithm” Science Direct 2017.
[6] Sahar H. El-Khafifand Mohamed A. El-Brawany, “Artificial Neural Network-Based Automated ECG Signal Classifier”, 29 May 2013.
[7] Senthilkumar Mohan, Chandrasegar Thirumalai, and Gautam Srivastava, titled "Effective Heart Disease Prediction Using Hybrid Machine Learning Techniques" and published in IEEE ACCESS in 2019, proposes a novel approach to predicting heart disease using a combination of machine learning algorithms.

INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor: 8.379

doi cross ref

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

9940 572 462 6381 907 438 ijircce@gmail.com

www.ijircce.com

Scan to save the contact details