EARLY PREDICTION OF CORONARY HEART DISEASE

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Abstract — In this paper, This study proposes an effective heart disease prediction model (HDPM) for a CDSS which consists of Density-Based Spatial Clustering of Applications with Noise (DBSCAN) to detect and eliminate the outliers, a hybrid Synthetic Minority Over-sampling Technique-Edited Nearest Neighbor (SMOTE-ENN) to balance the training data distribution and XG-Boost to predict heart disease.In this project we make use of real time hospital dataset. The proposed work predicts the chances of Coronary Heart Disease and classifies patient's risk levels by implementing different Machine learning techniques such as Support Vector Machine, KNN, Random Forest, Decision Tree. Thus, this presents a comparative study by analyzing the performance of different Machine Learning models.

INTRODUCTION

In Heart disease is a cardiovascular disease (CVD) that remains the number one cause of death globally and contributes to approximately 30% of all global deaths. If unmitigated, the total number of deaths globally is projected to increase to around 22 million in 2030. The American Heart Association reported that nearly half of American adults are affected by CVDs, equating to nearly 121.5 million adults. In Korea, heart disease is among the top three leading causes of death and contributed to nearly 45% of total deaths in 2018 [3]. Heart disease is a condition when plaque on arterial walls can block the flow of blood and cause a heart attack or stroke. Several risk factors that can lead to heart disease include unhealthy diet, physical inactivity, and excessive use of tobacco and alcohol. These risk factors can be minimized by practicing good daily lifestyle such as salt reduction in the diet, consuming fruits and vegetables, doing regular physical activity, and discontinuing use of tobacco and alcohol which eventually could help to reduce the risk of heart disease [4]. The early

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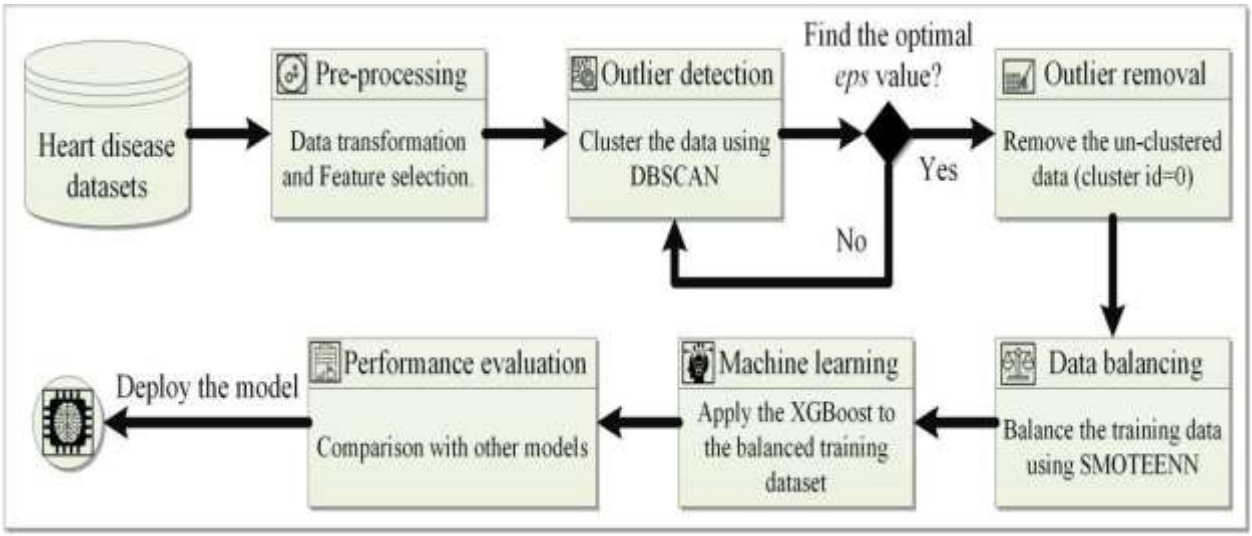
heart disease identification of high-risk individuals and the improved diagnosis using a prediction model have generally been recommended to reduce the fatality rate and improve the decision-making for further prevention and treatment.



System Architecture

PROPOSED SYSTEM

In the existing system, the results are compared for two datasets and the results are compared with various machine learning algorithms. A clinical decision support system, a hybrid Synthetic Minority Over-sampling Technique-Edited NearestNeighbor (SMOTE-ENN) to balance the training data distribution and XG-Boost to predict heart disease. Two publicly available datasets (Statlog and Cleveland) were used to build the model and compare the results can be used to diagnose the subject's heart disease status earlier. This study proposes an effective heart disease prediction model (HDPM) for a CDSS which consists of Density-Based Spatial Clustering of Applications with Noise (DBSCAN) to detect and eliminate the outliers with those of other models (naive Bayes (NB), logistic regression (LR), multilayer perceptron (MLP), support vector machine (SVM), decision tree (DT), and random forest (RF).

Disadvantages Of Existing system

- Time consuming.
- Require high storage capacity

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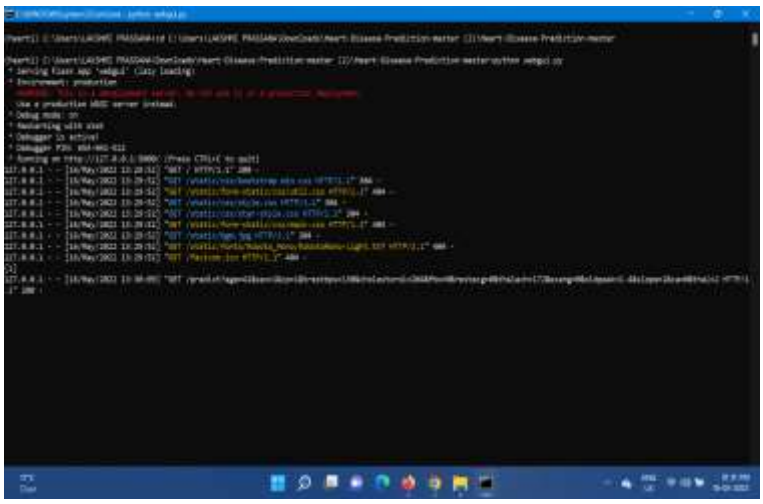
PROPOSEDSYSTEM

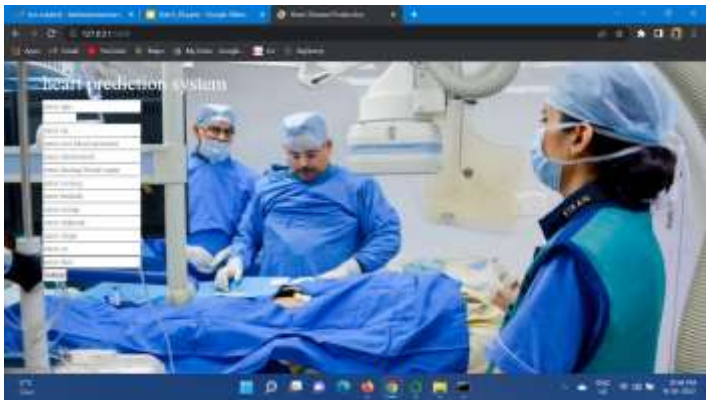
The proposed system overcomes the drawbacks of the shortcomings of the existing system. Managing fast execution and can work with minimum storage capacity. This results gives the maximum accuracy.

Advantages of Proposed system

- Consumes less time.
- Minimal manpower.
- Paper-less management.

RELATED WORK





Home Page for Heart disease prediction

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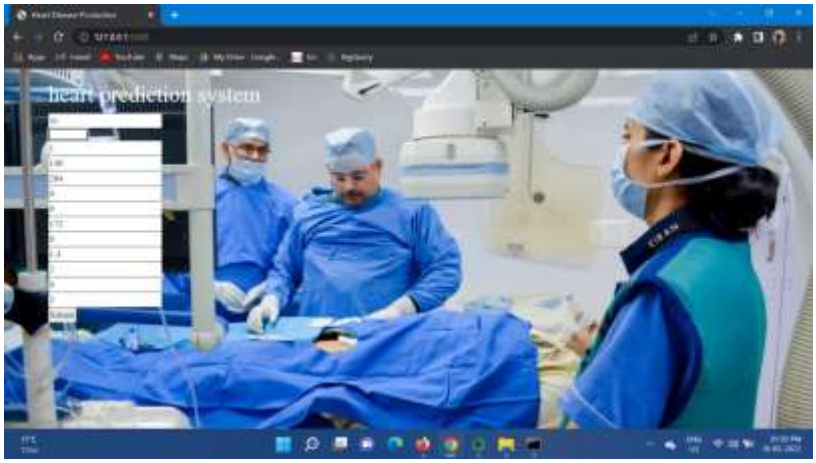

Input values

CONCLUSION

In this paper, We proposed an effective heart disease prediction model (HDPM) for heart disease diagnosis by integrating DBSCAN, SMOTE-ENN, and XGBoost-based MLA to improve pre-diction accuracy. The DBSCAN was applied to detect and remove the outlier data, SMOTE-ENN was used to balance the unbalanced training dataset and XGBoost MLA was adopted to learn and generate the prediction model. Using datasets of heart disease were utilized by produce the generalized prediction model. We performed evaluation analysis of our proposed model with other classication models and the results from previous studies. In addition, we presented the statistical evaluation to our model as compared to other models. The experimental results conformed that the proposed model achieved better performance for the taken dataset than previous study results, by achieving an accuracy up to 84.90%. In addition, the statistical-based analysis result also showed the significant improvement for the proposed model as compared with the other models.

FUTUREENHANCEMENT

Furthermore, we also designed and developed the proposed HDPM into the Heart Disease Clinical Decision Support System (HDCDSS) to diagnose the subjects'/patients' heart disease status effectively and effciently. The HDCDSS gathered the patient data combined with other diagnosis data and transmitted them to a secure web server. All the transmitted diagnosis data were then stored into MongoDB, which can effectively provide timely response with rapidly increasing medical data. The proposed HDPM was then loaded to diagnose the patients' current heart disease status, which was later sent back to the HDCDSS's diagnosis result interface. Thus,

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the developed HDCDSS is expected to help clinicians to diagnose patients and improving heart disease clinical decision making effectively and effciently. Finally, the overalldesigned and developed HDCDSS in this study can be used as a practical guideline for the healthcare practitioners.

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