Visualizing and Predicting Heart Diseases with an Interactive Dashboard

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P.K. Anooj et al.(2011) suggested a weighted fuzzy rule-based clinical decision support system (CDSS) for the diagnosis of heart disease, automatically obtaining knowledge from the patient's clinical data. It involves two methods: 1) automated approach for the generation of weighted fuzzy rules and 2) developing a fuzzy rule-based decision support system. The first method uses the mining technique, attribute selection and attribute weightage method to obtain the weighted fuzzy rules. Then, the fuzzy system is constructed in accordance with the weighted fuzzy rules and chosen attributes. Finally, the experimentation is carried out on the proposed system using the datasets obtained from the UCI repository and the performance of the system is compared with the neural network-based system utilizing accuracy, sensitivity and specificity.

C. Beulah Christalin Latha et al.(2019) improving the accuracy of prediction of heart disease risk based on ensemble classification techniques, to improve the performance, weak classifiers and ensemble algorithms are used, this work has used ensemble algorithms such as bagging, boosting, voting, and stacking. Some of the techniques used for such prediction problems are the Support Vector Machines (SVM), Neural Networks, Decision Trees, Regression and Naïve Bayes classifiers. This work has used ensemble algorithms such as bagging, boosting, voting, and stacking.

Aditi Gavhane et al. (2018) suggested a Neural Network model to predict heart diseases. It takes age, sex, blood pressure, heart rate, diabetes, cholestral and BMI as input into the Multilayer Perceptron algorithm. The sensors like AliveKor, MyHeart, HealthGear and Fitbit generate the parameters for the algorithm.

S. Mohan et al. (2019) suggested a hybrid machine learning technique to predict heart disease which enhances performance level with an accuracy level of 88.7% through the prediction model for heart disease with the hybrid random forest with a linear model (HRFLM). The severity of the disease is classified based on various methods like K-Nearest Neighbor Algorithm (KNN), Decision Trees (DT), Genetic algorithm (GA), and Naive Bayes (NB). The performance of this method can be estimated from the accuracy in the outcome results based on ECG data.

Deepika D et al.(2021) suggested an optimized unsupervised technique for feature selection and novel Multi-Layer Perceptron for Enhanced Brownian Motion based on Dragonfly Algorithm (MLP-EBMDA) for classification of heart disease. approach. Classification has been performed by multi-layer perceptron incorporated with enhanced Brownian motion on the basis of dragonfly algorithm. The analytical results explored that the proposed system has shown effective results than the traditional methods in terms of accuracy for predicting the heart disease. The proposed system revealed prediction accuracy at the rate of 94.28% and sensitivity as 98.92%, thus resulting in better prediction of heart disease as normal or abnormal.

K. Mathan et al. (2018) proposed a decision tree data mining method with a neural network classifier for the prediction of heart disease. Among the different prediction models, the Gini index and neural networks models produce reliable predictions. A multi-layer perceptron neural networks (MLPNN) is utilized. The calculation depends on the decision trees. The most noteworthy precision accomplished is 86.1% by the equivalent width Gain ratio decision tree.

R. Valarmathi et al. (2021) proposed a prediction system to detect heart disease which involves hyper parameter tuning of Random Forest Classifier and XGBoost Classifier model. Cleveland Heart Disease dataset (CHD) and Z-Alizadeh Sani dataset is used for the evaluation process. The performance of the algorithm is analyzed using Bayesian Optimization based on the Gaussian process. The parameters are tuned using methods like Grid Search, Randomized Search and Tpot Classifier. The random forest model with TPOT classifier gives the highest accuracy of 97.52% for the CHD dataset.

Ali A. Samir et al. (2021) used a CNN-jSO approach for the prediction of heart (cardiac) diseases, in which the jSO optimization algorithm is employed to tune those CNN hyperparameters. The performance of the designed system is tested on the Physio Net heart sound and Kaggle heartbeat sounds datasets. The proposed CNN-jSO is compared with other algorithms and shown to be better than them. The CNN-jSO system was implemented in Python and yielded 97.76% training accuracy and 94.12% testing accuracy.

Ashok Kumar Dwivedi et al.(2018) performance evaluation of different machine learning techniques for prediction of heart disease, six machine learning techniques have been applied including artificial neural network (ANN), support vector machine (SVM), logistic regression, k-nearest neighbor (KNN), classification tree and Naive Bayes. Moreover, the performance was compared using receiver operating characteristic (ROC) and calibration graph, the highest classification accuracy of 85% was reported using logistic regression with sensitivity and specificity of 89 and 81%.

Mohammad Shafenoor Amin et al. (2018) proposed data mining techniques that can improve the accuracy of predicting cardiovascular disease. Prediction models were developed using different combination of features, and seven classification techniques: k-NN, Decision Tree, Naive Bayes, Logistic Regression (LR), Support Vector Machine (SVM), Neural Network and Vote (a hybrid technique with Naïve Bayes and Logistic Regression). Experiment results show that the heart disease prediction model developed using the identified significant features and the best-performing data mining technique (i.e. Vote) achieves an accuracy of 87.4% in heart disease prediction.