ABSTRACT

Early Prediction of Heart Diseases using ML based Models

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Problem Statement:

To predict CVD (cardiovascular diseases) ,early, using basic blood tests, smoking history, etc. (which are easily accessible ,affordable in rural primary health centers) , using ML based prediction models.

Existing methodologies:

Currently in western countries, costly tests such as ECG, treadmill test ,fluoroscopy test, CT scans, etc. are used , for early detection of CVD's. These tests , are neither accessible , nor affordable in rural parts of India, and many cases of CVD, go un-noticed, until advanced stage. India witnesses huge number of cases(54.5 million) of CVD, most of them , are identified, only when it reaches, its advanced stage.

Proposed System:

A ML based Prediction model is proposed, to accurately predict CVD(cardio vascular diseases) early in patients, so that the complications , in the advanced stage of CVD , could be avoided , and many lives could be saved, especially in rural areas . Following ML algorithms are proposed to be used :

1)K nearest neighbors

2)Naïve bayes

3)logistic regression

To improve performance, other algorithms such as "Random Forest" etc. may be used.(depending on data set used.   )

70% data is used for training the model, in each of the above case, and remaining 30% is used to test the models. In preprocessing, non numerical values are encoded to 1/0. T-test ,co-variance, correlation etc. may be used , to identify, attributes , relevant to predict, CVD.(to get idea, about the attributes.), depending on the dataset.

The accuracy of each model should be measured and performance on testing data , may be further elaborated by constructing confusion matrix , and evaluating sensitivity ,specificity, etc.

The ML based heart disease prediction system , is proposed to be used , as a affordable, easily accessible , screening tool, to diagnose heart diseases in primary healthcare centers in India.

References:

Base Paper: Machine Learning -based heart disease prediction system for Indian population: An exploratory study done in South India

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