Project Design Phase-I

Proposed Solution

Date	18October 2022
Team ID	PNT2022TMID24640
Project Name	Statistical Machine Learning Approaches to Liver Disease Prediction
Maximum Marks	2 Marks

PROPOSED SOLUTION

Feasibility and Social Impact

The system being proposed here uses concept of machine learning and deep learning, and the models are first trained, then tested. Finally the most accurate model will predict the final result. At first, the system asks you to enter your details including age, gender, total Bilirubin, direct Bilirubin, total proteins, albumin, A/G ratio, SGPT, SGOT and Alkphos. Values of last eight parameters mentioned here, can be known by blood test report of the user. After taking these inputs from the user, the system compares the data input with the training dataset of most accurate model and then predicts the result accordingly as risk or no risk.

Novelty

The proposed solution uses advanced machine learning models like Random Forest, neural networks etc which provide better accuracy than traditional machine learning models and the is suitable for prediction with more number of features.

The system has following advantages:

No medical expertise required: You don't need to have any knowledge of medical science and liver diseases to predict the liver disease using this application. All you need to do is enter the details being asked, which are already present in the blood test report(some like age, gender are already known) and then you will get the results of prediction.

High accuracy: The system predicts the results with 100 % accuracy for the dataset that we have used while creating this application. While the accuracy might be different in some cases, it will still be high enough to be trustworthy at a large scale.

Immediate results: The results here are predicted within seconds of entering the details. You dont need to wait for a doctor to come, unlike in traditional method.

General workflow of the system related to creation and working

The application mainly consists of the following tasks:

Building and training the system: The phase is totally worked upon by developer of the system, and end user has nothing to do with it. In this phase, we split the dataset into training dataset and test dataset, and then trained the models using training dataset.

Testing the models: In this phase we tested the accuracy of the models with the test dataset that was formed in previous phase and the most accurate model is figured out.

Entering details and prediction: In this phase, the end user comes into picture. He/she enters the details of blood test report using GUI of the application. The application then matches the details with the training dataset of the most accurate model, and then predicts final result displaying, Risk or No Risk on the screen.

Diagrammatic representations:

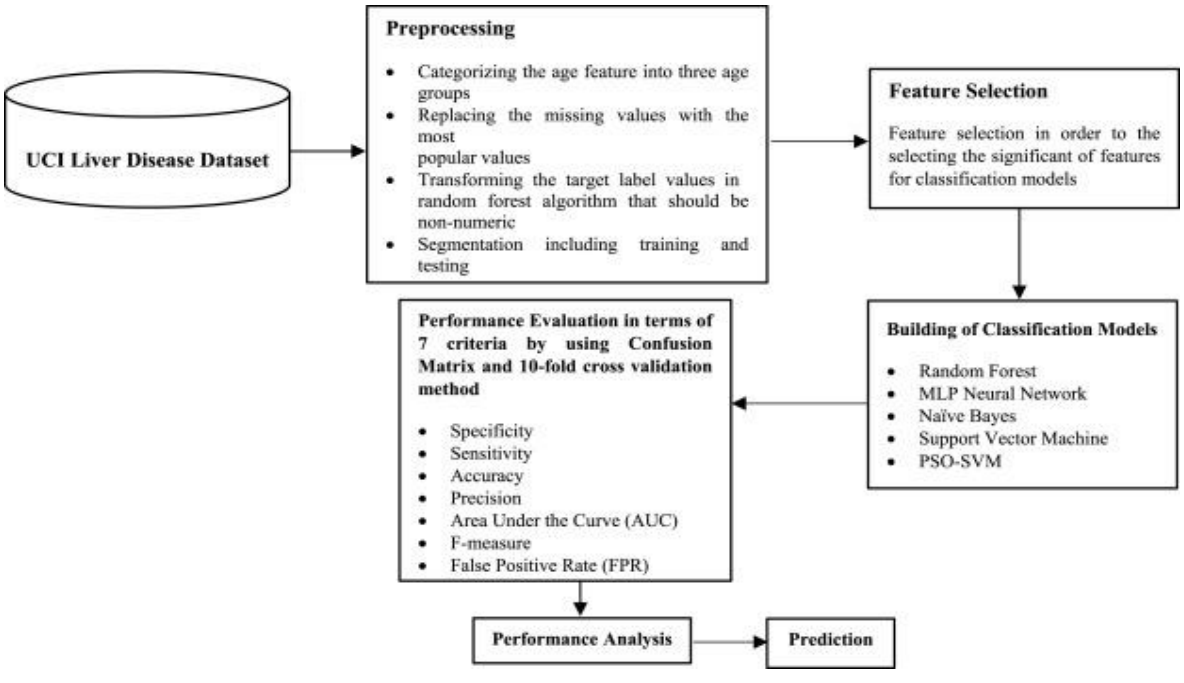
The diagrammatic representations of working of the system are as follows:

Use case diagram: The use case diagram of the system is as follows:

As we can see from the use case diagram first the user enters the blood test details and desktop app takes it as an input and predicts the output based on trained accuracy model and displays the result to the user whether the person is at the risk of liver disease or not.

Work flow diagram:

It represents flow of process which we have implemented to develop the prediction system.



Scope:

The scope is to create a model that predicts whether a person has a liver disease or not using Neural networks and Machine Learning .

Business Model:

The application created can be used by the medical sector for faster prediction of liver disease rather than using traditional methods that take a long time to provide results.

Scalability of the System:

The model can be integrated with equipments that measure different levels in the patient's blood and can be used to immediately predict the results.