Team ID   :   **PNT2022TMID13986**

Team Leader   : **Navaneethan R**
Team member : **Logesh G D**
Team member : **Sarun R**
Team member : **Mani Bharathi S**

LITERATURE SURVEY ON STATISTICAL MACHINE LEARNING APPROACHES TO LIVER DISEASE PREDICTION

Introduction :

Liver diseases avert the normal function of the liver. Mainly due to the large amount of alcohol consumption liver disease arises. Early prediction of liver disease using classification algorithms is an efficacious task that can help the doctors to diagnose the disease within a short duration of time. Discovering the existence of liver disease at an early stage is a complex task for the doctors. The main objective of this project is to analyze the parameters of various classification algorithms and compare their predictive accuracies so as to find out the best classifier for determining the liver disease.

The life of humans living without liver tumors is one of the fundamental care of human livelihood. Therefore, for better care, detection of liver disease at a primitive phase is necessary. For medical experts, predicting the illness in the early stages due to subtle signs is a very difficult task. Many, when it is too late, the signs become evident. The current work aims to augment the perceive nature of liver disease by means of machine learning methods to solve this epidemic. The key purpose of the present work focused on algorithms for classification of healthy people from liver datasets. Centered on their success variables, this research also aims to compare the classification algorithms and to provide prediction accuracy results.

Literature Survey :

In Human beings, Liver is the most primary part of the body that performs many functions including the production of Bile, excretion of bile and bilirubin, metabolism of proteins and carbohydrates, activation of Enzymes, Storing glycogen, vitamins, and minerals, plasma proteins synthesis and clotting factors. The liver easily gets affected due to intake of alcohol, pain killer tablets, food habits, and includes plenty of wired practices. Currently, the liver related diseases are identified by analyzing liver function blood test reports and scan reports. It takes more time as well as expensive. While employing different data mining algorithms to ease this process it is possible to reduce the time for diagnosing the liver disease. When more data are used, the prediction will be more accurate. To avoid the local storage scarcity experienced in many healthcare centres, cloud storage is used. As the documents generated are voluminous in size in health care centres cloud storage would be an appropriate choice. This article discusses different data mining algorithms like K-Nearest Neighbor (KNN), Decision Tree (DT) and Adaptive Neuro-Fuzzy Inference System (ANFIS) that are used to provide a decision support model that could help the physician in predicting the liver disease from the dataset. The performance of each algorithm is evaluated with respect to accuracy, sensitivity, precision and specificity. A survey on the efficiency of these algorithms is presented.

In the human body one of the most important organs is liver. If the regular functionality of the liver is disturbed then this condition is called disease affected liver. Therefore, an early stage of disease detection is more important which helps in disease prevention at starting stage with small medications. But, it is too difficult to identify Liver disease at early stages because symptoms are very less at the starting stage. Lab results with physical examination are involved in the Traditional methods. This paper aims to represent a Diagnosing for Liver disease prediction in Patients using Combined Machine Learning Models. Optimized three machine learning algorithms are used in

accurate diagnosis of liver disease by the doctors and these are Artificial Neural Networks (ANN), Decision Trees, K-Nearest Neighbors (KNN). With the help of these algorithms, given data is classified and results are produced. The future data is predicted with the help of past and present data in these machine learning algorithms. The accuracy results are produced by comparing three classification algorithms.

Liver Disease (LD) is the main cause of death worldwide, affecting a large number of people. A variety of factors affect the liver, resulting in this disease. The diagnosis of this condition is both expensive and time-consuming. Machine Learning offers a lot of potential in terms of automated disease diagnosis. As a result, the purpose of this research is to assess the efficacy of various Machine Learning (ML) algorithms to lower the high cost of liver disease diagnosis through prediction. With the current rise in numerous liver disorders, it's more important than ever to detect liver disease early on. This research proposed intelligent model to predict liver disease using machine learning technique. This proposed model is more effective and comprehensive in terms of performance of 0.884 accuracy, and 0.116 miss rate.

Liver, a crucial interior organ of the human body whose principal tasks are to eliminate generated waste produced by our organism, digest food, and preserve vitamins and energy materials. The liver disorder can cause various fatal diseases, including liver cancer. Early diagnosis, and treating the patients are compulsory to reduce the risk of those lethal diseases. As the diagnosis of liver disease is expensive and sophisticated, numerous researches have been performed using Machine Learning (ML) methods for classifying liver disorder cases. In this paper, we have compared four different ML algorithms such as Logistic Regression (LR), Decision Tree (DT), Random Forest (RF), and Extra Trees (ET) for classifying Indian Liver Patient Dataset (ILPD). Pearson Correlation Coefficient based feature selection (PCC-FS) is applied to eliminate irrelevant features from the dataset. Also, a boosting algorithm (AdaBoost) is utilized to enhance the predictive performance of those

algorithms. The comparative analysis is evaluated in terms of accuracy, ROC, F-1 score, precision, and recall. After comparing experimental results, we have found that boosting on ET provides the highest accuracy of 92.19%.

Liver illness is one of the worst diseases on the planet. It occurs in the human body, most notably in the liver. The liver's primary function is to eliminate waste created by organisms, to store key vitamins required by the body so that they do not go to waste, and to digest meals. This is a highly terrible disease, and the first thing that has to be done is to limit the risk explored by this lethal disease, and early detection can assist save the organism. The amount of people that are disease in the world is approx. 3.5 percent. The number of advancements that are happening in prediction of the disease done through the help of machine learning classification techniques like KNN, random forest SVM, and logistic regression. Other deep learning methods are also incorporated to solve this problem such as artificial neural network and convolution neural network. The methods would definitely increase the life expectancy of the patient suffering from this disease and avoid the chronic liver disease (CLD). The data may be gathered in enormous quantities as a result of the widespread use of bar codes for superior marketable items, the automation of many commercial and government transactions, and the advancement of data gathering systems. The proposed system that has been used ensemble methods such as random forest, xgboost and gradient boost and are combined to get a greater accuracy.

Conclusion :

SVM, Logistic Regression, comprises two main machine learning techniques used. Using all the models, the prediction analysis has been implemented and their performance has been assessed. The probability of liver disease prediction attained with an accuracy of 96%.In future , the present scenario can be compared with other techniques such as naive bayes classification, Random forest etc.,.

References :

[1] R. Kalaiselvi, K. Meena, V. Vanitha, "**Liver Disease Prediction Using Machine Learning Algorithms**", IEEE, 8 January 2022, DOI: 10.1109/ICAECA52838.2021.9675756

[2] Chokka Anuradha, D Swapna, Balamuralikrishna Thati, V Navya Sree, S Phani Praveen, "**Diagnosing for Liver Disease Prediction in Patients Using Combined Machine Learning Models**", IEEE, 25 February 2022, DOI: 10.1109/ICSSIT53264.2022.9716312

[3] Taher M. Ghazal, Aziz Ur Rehman, Muhammad Saleem, Munir Ahmad, Shabir Ahmad, Faisal Mehmood, "**Intelligent Model to Predict Early Liver Disease using Machine Learning Technique**", IEEE, 27 April 2022, DOI: 10.1109/ICBATS54253.2022.9758929

[4] Md. Fazle Rabbi, S. M. Mahedy Hasan, Arifa Islam Champa, Md. AsifZaman, Md. Kamrul Hasan,"**Prediction of Liver Disorders using Machine Learning Algorithms**", IEEE,01 February 2021,DOI: 10.1109/ICAICT51780.2020.9333528

[5] Sai Rohith Tanuku, Addike Ajay Kumar, Sai Roop Somaraju, Rushitaa Dattuluri, Madana Vamshi Krishna Reddy, Sambhav Jain, "**Liver Disease Prediction Using Ensemble Technique**", IEEE, 07 June 2022, DOI: 10.1109/ICACCS54159.2022.9784999