Literature Survey

1. Somaya Hashem a,e, Mahmoud ElHefnawi a,e, Shahira Habashy b, Mohamed El-Adawy b,Gamal Esmat c "**Machine Learning Prediction Models for Diagnosing Hepatocellular Carcinoma with HCV-related Chronic Liver Disease**" Computer Methods and Programs in Biomedicine ,Volume 196 ,2020 worked on a dataset consists of 4423 patients details for prediction of HCC presence using classification and regression tree, alternating decision tree, reduce pruning error tree and linear regression algorithm .

Merit

- Accuracy between 93.2% and 95.6%.

Demerit

- Only ADTree achieved higher accuracy rate when compared to CART and regression model.

2. Rayyan AzamKhan ,YigangLuo ,Fang-XiangWu "**Machine learning based liver disease diagnosis: A systematic review" Neurocomputing, Volume468, 2022** investigated the potential of CAD system for detection of liver disease using the image acquisition modalities and machine learning algorithms like SVM, KNN , Neural Network.

Merit

- Best performance obtained by CNN.

Demerit

Large computation time and imbalanced dataset problems.

3. Varun Vats, Lining Zhang, Sreejit Chatterjee, Sabbir Ahmed, Elvin Enziama and Kemal Tepe **"A Comparative Analysis of Unsupervised Machine Techniques for Liver Disease Prediction**" **2018** proposed a paper by comparing the unsupervised machine learning techniques such as K-Means, Affinity propogation, and DBSCAN to predict liver disease. Among the three algorithms K-Means is proved as an optimal method for liver disease prediction by using Silhouette Coefficient. The algorithms are applied on a medical dataset containing liver disease related data.

4. Golmei Shaheamlung, Harshpreet Kaur, Mandeep Kaur "**A Survey on machine learning techniques for the diagnosis of liver disease" 2020** has discussed about the machine learning techniques used for liver disease prediction by various authors previously. The common machine learning techniques used for liver disease prediction are SVM, KNN, K-Means, Decision tree, and Neural network. All these are measured by analysis methods like accuracy, sensitivity, specificity, and precision. Different algorithm has different performance based on different scenarios. So a hybrid machine learning model can improve the performance and accuracy.

5. Satessh Ambesange, Vijayalaxmi A, Rashmi Uppin, Shruthi Patil, Vilaskumar Patil "**Optimizing Liver disease prediction with Random Forest by various Data balancing Techniques**" worked on Random Forest (RF) algorithm to predict the disease with different preprocessing techniques. Data set is checked for skewness, outliers and imbalance using univariate and bivariate analysis and then suitable algorithms used to remove outliers and various oversampling and under sampling techniques are used to balance the data.

Merit

- Balance dataset give high accuracy

Demerit

- If Data set is imbalanced then accuracy is low

6. Sateesh Ambesange, Ranjana Nadagoudar, Rashmi Uppin, Vilaskumar Patil, Shruti " **Liver Diseases Prediction using KNN with Hyper Parameter Tuning Techniques**" worked on prediction of liver disease by Machine learning based model trained with the dataset. Feature analysis ,transformation techniques have been used to transform the data .Here K-Nearest Neighbor model is used to diagnose and predict liver disease. Grid Search is used for tuning the model's hyper parameters.

Merit

- High Accuracy

Demerit

Require large dataset for better performance

7. Rakshith D B Mrigank Srivastava Ashwani Kumar Gururaj S P" **Liver Disease Prediction System using Machine Learning Techniques"(2021)** worked with a diagnosis of liver disease using various machine learning models. Machine Learning models such as Naïve Bayes, Artificial Neural Network , KNN are used to predict the liver disease by using different attributes .

Merit

- No medical expertise required
- Immediate results

Demerits

- Naïve Bayes model produce less accuracy than K-Nearest Neighbour, Artificial Neural Network.

8. Sivasangari "**Diagnosis of Liver Disease using Machine Learning Models "(2020)** worked with a diagnosis of liver disease using various machine learning models. Three machine learning models namely Support Vector Machine, Decision Tree and Random Forest is used to predict the liver disease by using different attributes .

Merit:

- Random forest operated very fast and efficiently, with more high dimensionality data set.

Demerits:

- Accuracy of decision tree is less than Support Vector Machine and Random-Forest models
- Large numbers of trees will do a positive result in Random Forest.