**A Review of Liver Patient Analysis Methods Using Machine Learning**

**Define Problem/ problem understanding:**

Liver diseases averts the normal function of the liver. This disease is caused by an assortment of elements that harm the liver. Diagnosis of liver infection at the preliminary stage is important for better treatment. In today’s scenario devices like sensors are used for detection of infections. Accurate classification techniques are required for automatic identification of disease samples. This disease diagnosis is very costly and complicated. Therefore, the goal of this work is to evaluate the performance of different Machine Learning algorithms in order to reduce the high cost of liver disease diagnosis.

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. In this project we will analyse the parameters of various classification algorithms and compare their predictive accuracies so as to find out the best classifier for determining the liver disease.

**Specify the Business problem:**

This project compares various classification algorithms such as Random Forest, Logistic Regression, KNN and ANN Algorithm with an aim to identify the best technique. Based on this study, Random Forest with the highest accuracy outperformed the other algorithms and can be further utilised in the prediction of liver disease and can be recommended to the user.

**Business Requirements:**

Patients with Liver disease have been continuously increasing because of excessive consumption of alcohol, inhale of harmful gases, intake of contaminated food, pickles and drugs and other factors. This dataset was used to evaluate prediction algorithms in an effort to reduce burden on doctors. Use these patient records to build a prediction model that will predict which patients have liver disease and which ones do not.

**Literature Survey**

With a growing trend of sedentary and lack of physical activities, diseases related to liver have become a common encounter nowadays. In rural areas the intensity is still manageable, but in urban areas, and especially metropolitan areas the liver disease is a very common sighting nowadays. Problems with liver patients are not easily discovered in an early stage as it will be functioning normally even when it is partially damaged.

An early diagnosis of liver problems will increase patients survival rate. There are various algorithms that have been used with varying levels of success. Logistic regression, decision tree, random forest, and neural networks have all been used and have been able to accurately predict liver disease.

This paper is structured as follows. Section two briefly Data set of liver disorders, Section three reviews the various methods of liver disorders finally, Section four is a conclusion. The used data source in this study is UCI machine learning repository.The Liver Disorders data is named as BUPA Liver Disorders.

Liver disorders are also an important disease in medicine. Levels of enzymes combined to blood are analyzed in Liver Disorders diagnosis. It can be a lot of possible errors in this diagnosis due to the number of enzymes to be many as well as the effects of different taken alcohol rates to be very from one patient to the other.

Problems with liver patients are not easily discovered in an early stage as it will be functioning normally even when it is partially damaged. An early diagnosis of liver problems will increase patient’s survival rate. Liver disease can be diagnosed by analyzing the levels of enzymes in the blood. Furthermore, nowadays mobile devices are widely used for supervision humans’ body conditions.

In this method is used for to predict the susceptibility to two liver diseases such as chronic hepatitis and cirrhosis from single nucleotide polymorphism(SNP) data . They also used to identify a set of SNPs relevant to those disease.

Liver disease can be diagnosed by analyzing the levels of enzymes in the blood. Furthermore, nowadays mobile devices are widely used for supervision humans’ body conditions. In addition, automatic classification algorithms are demanded. According to their implements for liver diseases (almost definitely mobile capable or web capable), that decline the patient queue at the liver experts such as endocrinologists.

**Social Or Business Impact**

Social Impact:- Today almost everybody above the age of 12 years has smartphones with them, and so we can incorporate these solutions into an android app or ios app. Also it can be incorporated into a website and these app and website will be highly beneficial for a large section of society.

Business Model/Impact:- Its now more feasible Blood test centers to give the result. As for this model user don’t need to have any deep knowledge of medical science and liver diseases.

User need to do pass the details being asked, which are already present in the blood test report ( some like age, gender are already known) and then user will get the results of prediction.