**Liver Disease Detection and Classification Using Machine Learning and Deep Learning Technique**

**Abstract**

The rapid growth in count of patients suffering from liver disease is a major concern all over the globe. Identification of persons having liver disease is done through liver biopsy and by visual checking of MRI by trained experts which is a tedious and time-consuming process. Therefore, there is a need to develop automated diagnosis system which can provide results in less time and with high accuracy. Researchers worked on this domain and came up with various models for detection of liver disease and its severity using machine learning algorithms. In proposed method SVM, Logistic regression are used for liver dataset while CNN and ANN with liver images dataset and added two new modules as extension where one module take test data as input and then used logistic regression to predict weather that test data contains liver disease or not. Similarly in second module we will upload test image and then ANN will predict weather image is normal or not. Accuracy of CNN model is superior compare to the state of art techniques.

Keywords: Liver disease prediction , Convolutional neural Network , Support vector machine , machine learning , deep learning , Classification.

**Existing Method**

1. Only one type of data is collected for recognition of liver disease (manual method)
2. Mainly Machine learning classification is used like SVM , LR

**Drawbacks of Existing Methods :**

1. ML classification is suitable for dataset with tabular format (CSV or xlsheet ) and for image data its giving less accuracy
2. Accuracy of prediction is less in single type of data (either csv or image )
3. More time
4. Manual process is bit complex

**Proposed Method:**

1. Deep learning Convolution Neural Network(CNN)

**Advantages:**

1. Proposed module works on two types of data dataset and image data
2. More accuracy is obtained by CNN model
3. Easy Interface can be generated

**Applications**

1. Smart hospitality
2. Hepatologist can get help
3. In the areas where doctors are not available

**SOFTWARE AND HARDWARE REQUIRMENT SPECIFICATION**

**Hardware Requirement:**

• Processor Type: Pentium -IV

• RAM: 512 MB RAM

• Hard disk: 20 GB

**Software Requirement:**

• Operating System: Windows 2007

• Script: python

**Libraries Used**

1. pip install numpy==1.19.2
2. pip install pandas==0.25.3
3. pip install matplotlib==3.1.1
4. pip install keras==2.3.1
5. pip install tensorflow==1.14.0
6. pip install h5py==2.10.0
7. pip install protobuf==3.16.0
8. pip install scikit-learn==0.22.2.post1
9. pip install seaborn==0.10.1
10. pip install opencv-python==4.1.1.26
11. pip install opencv-contrib-python==4.3.0.36
12. pip install imbalanced-learn==0.6.2
13. pip install imblearn==0.0