

# Multi Disease Detection using Deep Learning

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**Abstract** -The main causes of disability and death in India and around the world are chronic diseases like heart disease, cancer, diabetes, stroke, and arthritis. Since these illnesses have a higher death rate than other illnesses, it is important to discover a promising treatment for chronic illnesses. The expansion of medical data in the healthcare industry and precise medical data analysis are beneficial for disease early diagnosis, patient care, and community services. With the Deep Learning model, which is more capable of performing a variety of tasks, the properties of medical data are extremely compatible. By lowering the mortality rate of chronic diseases, we hope to create a system for numerous diseases that can detect them early and perhaps save many lives.

**Key Words:** Accurate, Chronic, Diagnosis, Detection, Healthcare, Prediction, Solution.

## 1. INTRODUCTION

The main problem of healthcare organizations (hospitals, medical centers) is to provide quality services at affordable costs. Quality care means that patients are properly diagnosed and treated effectively. Bad clinical decisions can lead to disastrous consequences, which are therefore unacceptable. Hospitals also need to reduce the cost of clinical testing. They can achieve these results by using appropriate computerized information and decision support systems. Most hospitals today use some type of hospital information system to manage health or patient records. These systems usually generate large amounts of data in the form of numbers, texts, charts, and images.

An efficient solution over manual diagnosis techniques. The Expansion of this work is to create a more fine prediction and broaden the technique to modify the classification of disease based on prediction. This model will help doctors to cross verify the tests result provided by the labs. This system can be used by doctors to enhance doctors experience over diseases. By using this model we will be able to reduce the cost of tests that needs to carry out for the detection of chronic disease. However, the analysis of patients is depending on accuracy of diagnosis and then treatment as well. The wrong diagnosed patients lead to deaths in chronic type diseases. So the high risk of diagnosis there is need of accurate diagnosis aid for chronic diseases.

### 1.1 Need of the Topic

With the progress of society, people's living habits and environmental conditions are gradually changing, which

invisibly increases people's hidden dangers of various diseases. Major diseases such as Brain Health, Cardiovascular Diseases, Vision Impairment, Diabetes, Cancer, etc, have a serious impact all over the world. Looking at diabetes alone, there are 422 million people in the world who are troubled, and Type 2 diabetes patients account for more than 90%. With the increase of age, the heart senescence and loss of function make the risk of heart diseases increase. Heart disease deaths account for more than 30% of global deaths. These major diseases seriously affect human health and reduce personal productivity. At the same time, it will aggravate social pressure and increase medical and health care expenditure

Although work is carried out for different diseases but there is not any promising solution found that gives accurate diagnosis for all in one. This model is trying to develop system for multi-disease detection and stages predictions gives early detection and saves lots of life's by reducing death rate by chronic diseases. It goals to make clear the effectiveness of deep gaining knowledge of in disorder prediction, and Demonstrates the excessive correlation among deep studying and the scientific area in destiny development. The unique feature extraction methods of deep learning methods can still play an important role in future medical research. The ability of deep learning to process complex data, the method of extracting the main features of multi-dimensional data, the efficient response to unstructured data, and the classification strategy with higher accuracy are all superior to the previous technical methods. There is a wealth of hidden information in these data that is largely untapped. This raises an important question: "How can we transform data into useful information that enables clinicians to make informed clinical decisions?" This is the main motivation for this topic

## 2. LITERATURE SURVEY

According to [1] the disease prediction, model uses K-Nearest Neighbor (KNN) and Convolutional neural network(CNN) machine learning algorithm for accurate prediction of disease. The accuracy of general disease prediction by using CNN is 84.5%. We compare the results between KNN and CNN algorithm in terms of accuracy and time and the accuracy of CNN algorithm which is more than KNN algorithm and time required for classification for CNN is less than KNN. So we can say CNN is better than KNN in terms of accuracy and time.

According to [2] Machine learning is to discover examples and highlights in images that measure the values dependent on application. Image classification is done by using the Machine Learning based Reinforcement Learning Algorithms. The output result shows better efficiency in terms of sensitivity and accuracy using medical image processing technique. Image classification is not done by using the Machine Learning based supervised Learning Algorithms and unsupervised Learning Algorithms.

According to [3] Supervised machine learning techniques used in this prediction of heart disease are artificial neural network (ANN), decision tree (DT), random forest (RF), support vector machine (SVM), naïve Bayes(NB)and k-nearest neighbor algorithm. Furthermore, the performances of these algorithms are summarized. It is better to use search algorithms for selecting the features and then applying machine learning techniques for prediction will give us better results in the prediction of heart disease.

According to [4] For predicating a cure for cancer, some of the methods are artificial neural networks (ANNs), support vector machine (SVMs) and decision trees (DTs). In this study, the ML &DL approaches used in cancer progression modeling are reviewed. The predictions addressed are mostly linked to specific ML, input, and data samples supervision. By using the proposed framework, we would like to use other state of the art machine learning algorithms and extraction methods to allow more intensive comparative analysis.

### 3. PROPOSED SYSTEM

This application of Deep Learning has the potential to significantly detect and classify with almost accuracy for the low population, high dimensional dataset without requiring any hand-crafted, case specific features. For future work, can implement this technique on some more images. Increasing the number of images used for the process, can improve the accuracy. This application is included with predefined scale for detection of disease. The score of this scale will help us to understand the seriousness of the disease and will lead to the precautions to be taken. In the proposed system Gaussian Filter is used for image filtering and also it is faster because multiplying and adding is faster than sorting.

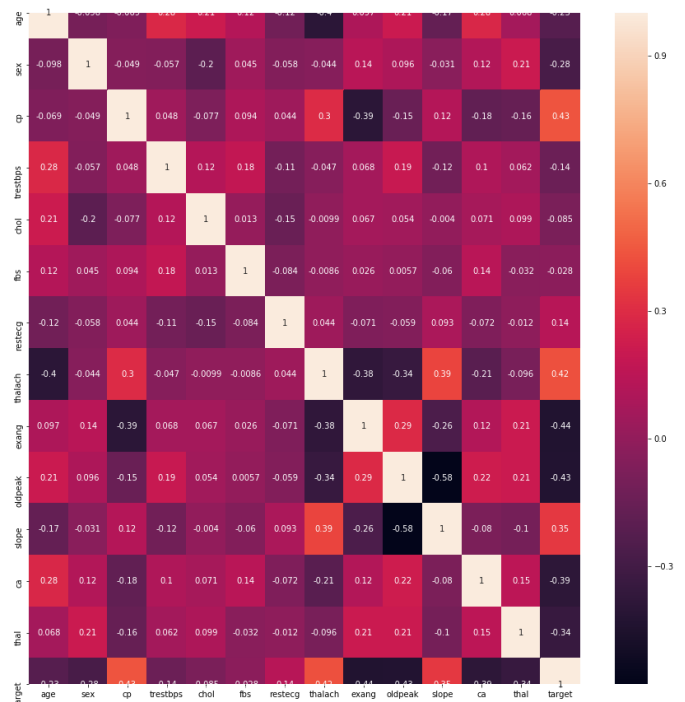


Fig 1.Heart Disease Prediction Heat Map

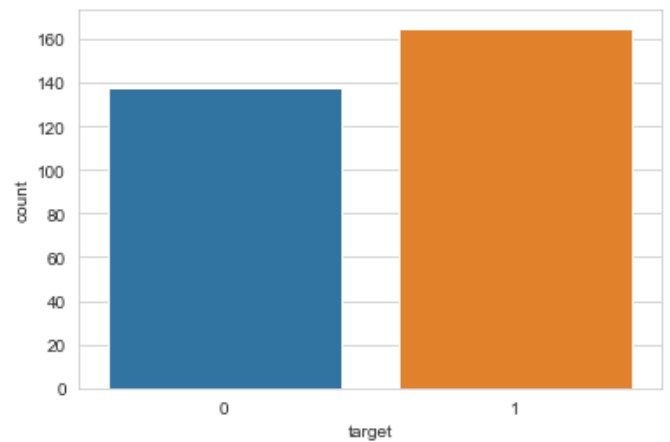


Fig 2. Count-Target Graph

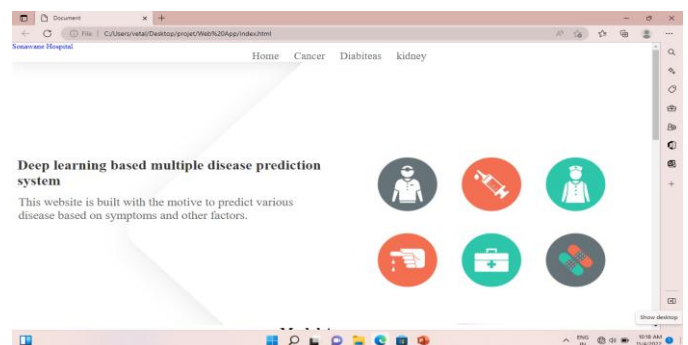
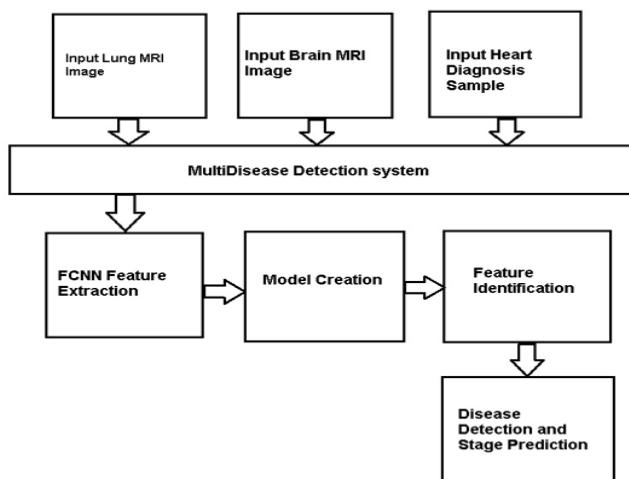


Fig 3. Proposed System GUI

#### 4. PROPOSED SYSTEM ARCHITECTURE

The system experiences three diseases namely heart disease, diabetes and malaria because they are interrelated. The first step is to import the UCI dataset, the PIMA dataset and the corresponding Indian liver dataset. After we import the dataset, a visualization of each input will take place. After visualization, data preprocessing takes place where we check outliers, missing values and also scale the dataset, then on the updated dataset, we split the data into shape and test. Then on the training dataset, we applied the knn, xgboost random forest algorithm and applied the knowledge of the classified algorithm using the test dataset. After applying the knowledge, we will choose the algorithm with the best accuracy for each disease. Next, we built a pickle file for all diseases and then we integrated the pickle file with the django framework to export the model to the web.



#### 5. CONCLUSIONS

Developing the most promising system for multi disease detection and stages predictions which gives early detection and saves lots of lives by reducing death rate by chronic diseases. In the face of the high dimension and instability of medical data, deep learning has become the main driving force for the future development with its unique feature processing method and variable model. An efficient solution over manual diagnosis techniques. The Expansion of this work is to create a more fine prediction and broaden the technique to modify the classification of disease based on prediction. This model will help doctors to cross verify the tests result provided by the labs. This system can be used by doctors to enhance doctors experience over diseases. By using this model we will be able to reduce the cost of tests that needs to carry out for the detection of chronic disease.

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