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PREDICTION OF LUNG CANCER USING DEEP LEARNING

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ABSTRACT

Machine Literacy is a branch of artificial intelligence that employs a variety of statistical, probabilistic, and optimization ways that allow computers to "learn" from one exemplification and to descry hard- to- discern patterns from large, noisy, or complex data sets. Machine literacy offers a top approach for developing sophisticated, automatic, and objective algorithms for the analysis of high-dimensional and multimodal biomedical data. Machine literacy plays an important part in medical systems. before identification of conditions, we can be helped to descry them before and more directly, which can save numerous people as well as reduce the pressure on the system. Lung The early identification and vaticination of lung cancer have become a necessity in the exploration, as they can grease the posterior clinical operation of cases. Machine Learning grounded decision support systems donate the croakers.

Machine Learning and Deep Learning are used to reuse data as well as produce models for diagnosing cases. Combining the processing of patient information with data from casket X- rays, using CNN with the well- known-trained model, Caps Net network for data this form are the styles used for this design to identify lung conditions originally and dissect the data set, also apply Machine literacy and Deep literacy to prognosticate whether the case has lung complaint or not. The project is a double bracket with input being the case's data (age, gender, casket X-ray images & view position) and the affair is set up what the complaint is or not. The paper aims to describe and diagnose lung cancer as beforehand as possible with help of algorithms like SVM and CNN which will help the croaker.

Keywords: SVM algorithm, CNN algorithm, Deep Learning, Machine Learning.

I. INTRODUCTION

Lung cancer is a major growing disease all over the world. It is a disease of abnormal cells multiplying and growing into a tumor. Lung cancer often spreads toward the center of the chest because of the natural flow of lymph nodes. These cancer cells spread to the different organs in the body and this process is called 'Meta State' Image processing is widely used in the medical field to detect different kinds of diseases. We detect these tumors through four stages. The first stage is collecting data from different CT scans of the lungs that is normal and abnormal through Kaggle. In the second stage, we apply several types of image enhancement techniques to get the best quality images. In the third stage, we apply different algorithms for image segmentation and in the fourth stage we obtain general features from the enhanced segmented image which gives an indicator of the normality or abnormality of images. Lung disease is the most dangerous and widespread disease so, early detection of the disease can avoid serious problems.

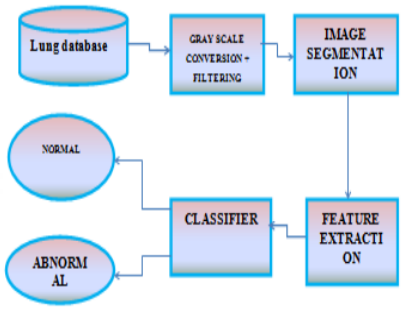

Figure.1 Block Diagram

II. Existing System

In the previously existing models, they used the back propagation neural network method to improve the accuracy and used ant colony optimization with ANN and SVM to predict the accuracy. The outcomes are encouraged by an SVM classifier to decide whether the lung picture is carcinogenic or not. The SVM classifier is assessed dependent on an LIDC dataset. The disadvantages of previously existing models are the CT filter picture is pre-prepared and pursued by division of the ROI of the lung, the Discrete waveform Transform is connected for picture pressure and highlights are extricated utilizing a GLCM.

III. Working

The collected data sets are being uploaded and the datasets are being split into test and train sets in the percentage of 80 to 20. Based on our requirements we use the 3 algorithms to find out the accuracy rate and normality and abnormality of the lungs. When we upload a data item the required algorithm compares the data item to the existing data set items and gives the results as normal and abnormal. The comparison between the two algorithms is done based on the accuracy graphs so that we can identify the best algorithm to be used for Lung cancer detection.

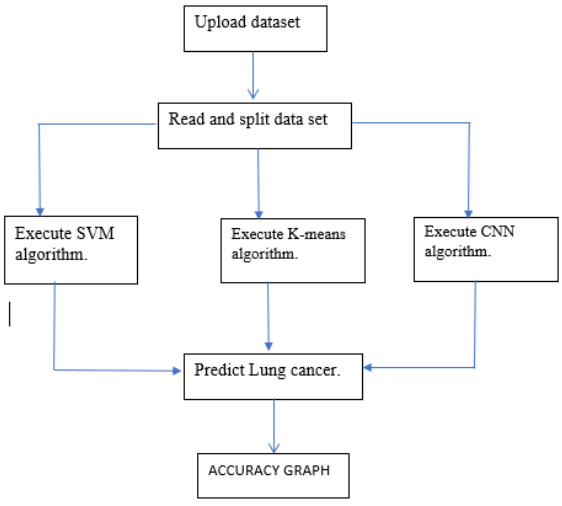

Figure 2. Flow Chart of Working

IV. Proposed System

Deep Learning has been proposed as a promising tool to classify malignant nodules. We aim to validate lung cancer prediction using a convolution neural network by comparing the accuracy with the other algorithms. We as users train the model with the data set as train data and test data. When we assign new data, the assigned data will be classified into the required group of the data set. The classification is done by using different algorithms like SVM, CNN, K-Means, and KNN.

V. Implementation and results:

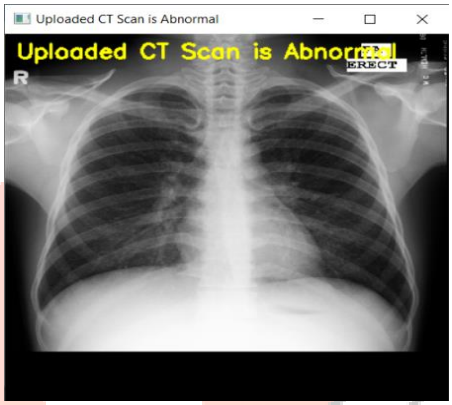

Figure 3. Output result

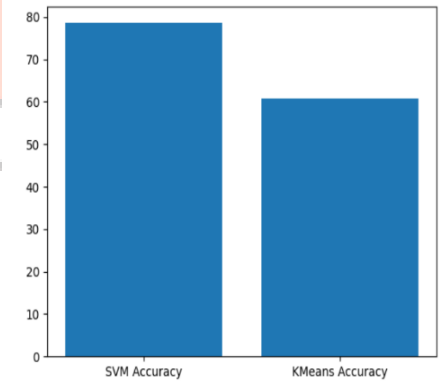

Figure 4. Accuracy graph

- Image enhancement is the process of sharpening or smoothen the image. It provides better input for the digital image processing. The objective of image enhancement is to process the image so that it is better suited for the further processing.
- Gabor filter is a linear filter used for texture analysis, which means that it basically analyses whether there is any specific frequency content in the image in specific directions in a localized region around the point or region of analysis in the spatial domain.
- Feature plays a very important role in the image processing. Before getting features, various image pre-processing techniques like binarization, normalization, masking approach etc., are applied on the sampled image feature extraction techniques are applied to get features that will be useful in classifying and recognition of images.
- Thresholding is one of the most powerful tools for image segmentation. The segmented image obtained from

thresholding has the advantages of smaller storage space, fast processing speed and ease in manipulation, compared with gray level image which usually contains 256 levels.

- The data items are compared with the given set and using the different algorithms the normality and abnormality are decided

We get the accurate results and Identifying the disease at an early stage reduces diagnosis errors caused by humans and the efficiency has been Improved. Developing and implementing deep learning algorithms requires technical expertise, which may not be available to all healthcare providers or facilities. Deep learning algorithms may sometimes become overfitted to the training data. Lung cancer is detected at early stage and the progression of the disease can be predicted based on that planning of treatment can be estimated.

VI. Conclusion

For the patient to receive therapy early, an image-processing approach is created to detect diseases at an early stage of cancer. The ability to spot aberrant tissue in target x-ray pictures is greatly influenced by time. One of the main driving forces behind this research is the precision and quality of the images. Low-level pre-processing techniques based on a Gabor filter were utilized for both image quality and image enhancement stages. This method is effective for the segmentation stages, allowing for the extraction of the region of interest. A comparison between normality and abnormality is conducted based on general characteristics. The primary characteristics for reliable picture comparison are pixel percentage and masking, which suggests that early detection of this disease is crucial to preventing serious stages and reducing its global distribution percentage.

VII. Future scope

The future scope of lung disease detection using deep learning is promising, as deep learning algorithms have shown great potential in accurately detecting and diagnosing various lung diseases such as pneumonia, tuberculosis, and lung cancer. One of the major advantages of deep learning in lung disease detection is its ability to analyze large amounts of medical data and extract relevant features, which can aid in more accurate and reliable diagnoses. Deep learning can also help develop personalized treatment plans based on a patient's specific medical history and disease characteristics. With the increasing availability of medical data and the rapid development of deep learning technologies, the future of lung disease detection using deep learning is expected to be transformative in the field of healthcare. It may lead to faster and more accurate diagnoses, improved patient outcomes, and lower healthcare costs. However, it is important to note that the accuracy and effectiveness of deep learning algorithms depend on the quality and quantity of the training data, and ethical considerations should always be considered in the development and deployment of such systems.

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