LUNG CANCER DETECTION USING ARTIFICIAL INTELLIGENCE

[1]Beldar Sonali, [2]Wagh Nishigandha, [3]Arkhade Prajakta, [4]Wagh Shobha, [5]Prof. Chandgude A.S

[1,2,3,4]UG Students, [5]Project Guide
Department of Computer Engineering
SND COLLEGE OF ENGINEERING AND RESEARCH CENTER, YEOLA, NASHIK, 423401

Abstract: **Identification of lung cancer is an efficient way to minimize the death rate and maximize survival rate of patients. It is an essential step to screen out the computed tomography (CT) images for pulmonary nodules towards the efficient treatment of lung cancer. However, robust nodule identification and detection is a most critical task due the complexity of the surrounding environment and heterogeneity of the lung nodules. The use of machine learning to detect, predict, and classify disease has grown exponentially in the past few years, especially for complex tasks such as lung cancer detection and recognition. Deep Convolutional neural networks (DCNN) have exploded in popularity for transforming the field of computer vision research. In this paper, we are using Deep Convolutional Neural Network for lung cancer classification using CT images-based lung cancer image dataset consortium (LIDC) for detecting cancerous and noncancerous lung nodules for measuring the accuracy of classification better than existing methods.**

Keywords: **Lung Cancer, CNN, Computed Tomography, computer vision**.

I. INTRODUCTION

Lung Cancer is a leading cause of deaths worldwide. The National Lung Screening Trial (NLST) is a randomized controlled trial in the U.S. including more than 50,000 high risk subjects, showed that lung cancer screening using annual low dose computed tomography (CT) reduces lung cancer morality by 20% in comparison to annual screening with chest radiography. Machine Learning has proved itself in many visual recognitions systems, for finding discriminative features without any segmentation and increasing object detection accuracy. To use the Machine Learning effectively huge dataset is required and its availability in our problem motivated to go for it.

II. MOTIVATION

Highly influenced by the teachings of the Shrimad Bhagavad-Gita we decided work for the people who have a Cancer disease. During academics we had met people with cancer disease, we had seen their problem closely. So that was the biggest motivation for us to create this project.

III. PROBLEM DEFINATION

In the world of technology, everything and everyone in the world is growing so rapidly, so we think whose have a cancer disease try to solve their problem. The prediction of lung cancer-prone patients will aid doctors in their treatment decision-making. As technology is changing world so rapidly, so technology can also change the life of such people,

IV. REVIEW OF LITERATURE

Comparative study of lung cancer detection using Machine Learning Algorithm. In this paper Datasets have been collected from UCI ML repository and Data world. Here the datasets have been trained by SVM, LR, NB, DT finally they have compressed the accuracy of the model and in that SVM had provided more accurately.

Lung Cancer Detection using ANN. In this paper they have used the technology Data Mining and they have trained models based on ANN and vali21dated the results.

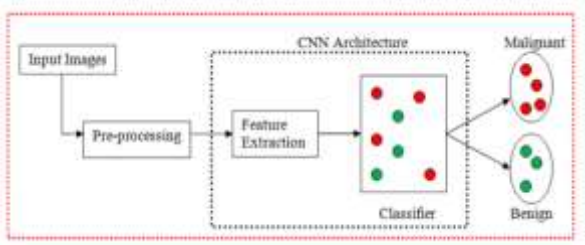
Predicting Lung cancer in machine learning. In this paper Digital image processing is well known for phase of preprocessing image and they have trained ANN to obtain the results.

Predicting lung cancer using Epidemiological. In this paper they has been uses to predict lung cancer they have used two nonlinear generative models one based on generative adversarial network and another on Variational autoencoder are used to synthesize auxiliary positive samples for training set.

V. PROPOSED SYSTEM

In the process of lung cancer classification, the images applied at the input layer of Deep Convolutional neural networks are classified into cancerous or non-cancerous at the output layer after processing in all hidden layers of the network. DCNN is a deep learning algorithm that takes an input image, and then marks significance for each object in the image. The network further classifies each object in the image one from the other when it is trained precisely with a greater number of datasets. Deep learning methods needs minimum preprocessing steps in comparable to the other image processing algorithms. The objective of DCNN is to convert input images suitable for processing with minimum permissible loss of image features for achieving the best level of accuracy.

VI. SYSTEM ARCHITECTURE



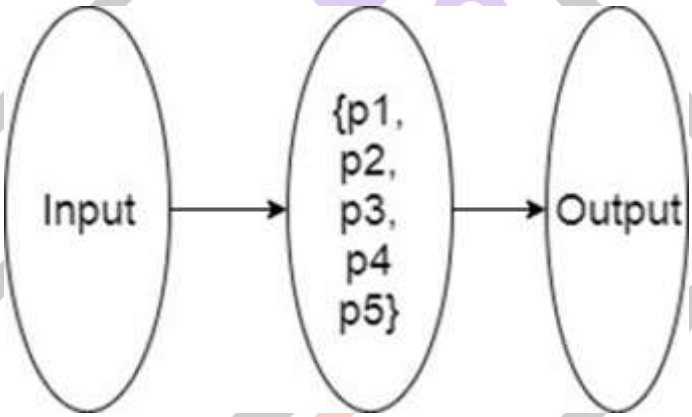
METHODOLOGY AND ALGORITHM.

Convolutional Neural Network: Neural networks, as its name suggests, is a machine learning technique which is modeled after the brain structure. It comprises of a network of learning units called neurons. These neurons learn how to convert input signals (e.g., picture of a cat) into corresponding output signals (e.g., the label "cat"), forming the basis of automated recognition. convolutional neural network (CNN, or Convent) is a type of feedforward artificial neural network in which the connectivity pattern between its neuron is inspired by organization of the animal visual cortex.\

Layers In CNN:

1. Convolution Layer
2. Subsampling Layer
3. Pooling Layer
4. Activation Layer

VII. MATHEMATICAL MODEL:



Let S be system:
S={I,P,O}
Input (video/frame)
P= {P1,P2,P3,P4} //Functions
S: is a System.
p1: Upload CT Scan Image.
p2: Preprocessing.
p3: Feature Extraction
P4: Classification.
Output(detect video forged or not)

VIII. SCOPE

This project is useful in order to diagnose the early-stage cancer. But there are still some improvements required for this project such as we could improve the accuracy by feeding more data.

ADVANTAGES:

- Easy to use
- High performance

APPLICATIONS:

- Hospitals
- In Laboratories
- Social NGO

IX. RESULT AND ANALYSIS

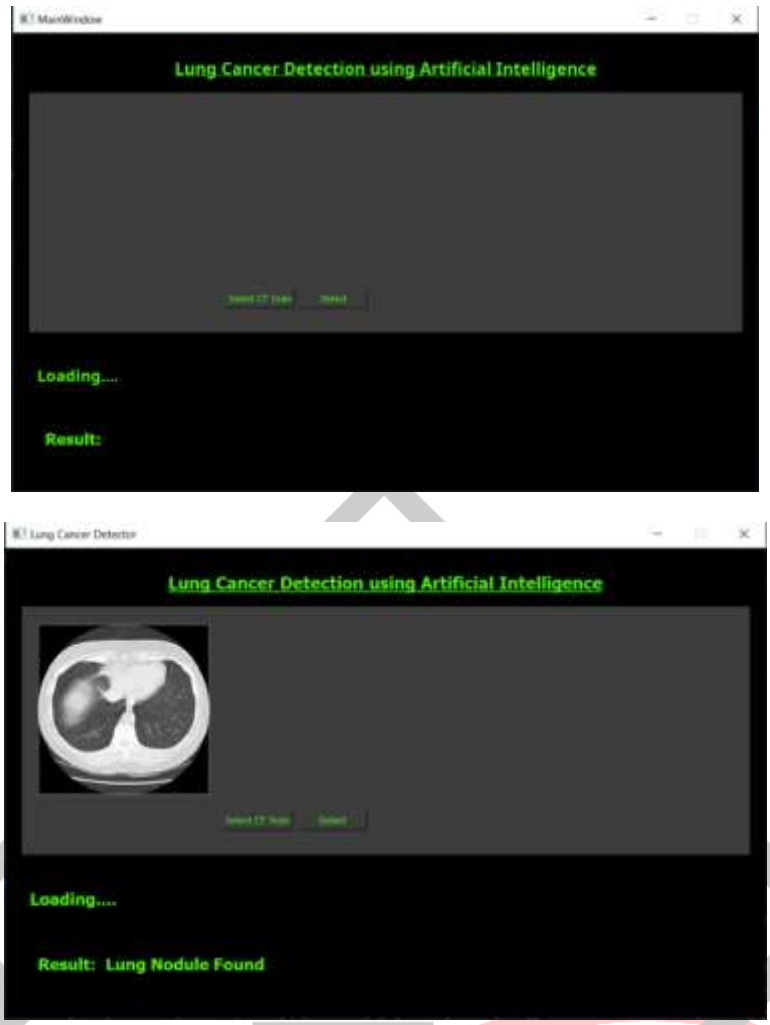


Fig- CT Scan Image After Segmentation

X. CONCLUSION

When lung cancer is diagnosed at an early stage, it would be beneficial because the medication will then be initiated to prevent disease from having a harmful result. Therefore, this paper summarizes a detailed survey on various machine learning approaches to classify lung malignancies using either CT scan images or X-ray images. Also, many classifiers have been used by the researchers in the literature such as: MLP, SVM, Naïve Bayes, Neural Network, Gradient Boosted Tree, Decision Tree, k-nearest neighbors, multinomial random forest classifier naïve Bayes, stochastic gradient descent, and ensemble classifier .Consequently, and based on the extensive survey that have been done in this work, it can be concluded that the methods which utilized deep learning techniques obtained higher results in terms of accuracy than other classical machine learning technics.

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