# A REVIEW ONEARLY DETECTION OF CANCER USING AI

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**ABSTRACT :**

The identification of lung cancer at the early stage is very demanding and difficult task due to construction of the cell. The cancer grows in the body when cancerous cells start to develop uncontrollably. The image processing plays vital role in the prediction of lung cancer at early stage which is also helpful in treatment to avoid the lung cancer. This proposed system is developed to detect lung cancer at early stage with the help of image processing techniques and artificial neural network classifier to design computer based diagnosis system. In this system, during the preprocessing step, several image enhancing techniques, masks are applied using morphological operations and thresholding technique, which eliminates background and surrounding tissue. Region of interest (ROI) is calculated using region based segmentation algorithm. Circle fit algorithm is used to extract the desired nodule. Radius, Mean Intensity, Area, Euler Number and ECD features are extracted in feature extracting step. Finally, Back propagation algorithm is used to train Artificial Neural Network (ANN) in categorization stage.v

**INTRODUCTION:**

The main cause of lung cancer is growth of cells in lung tissue which is irregular and out of control. One of the reasons is smoking. If it is detected earlier, then there will be a good chance of curing. Screening is the one of the important step for lung cancer detection. Screening is the process used to detect and identify the nodule. A nodule appear as round and white in co lour on a Co mputed Tomography scans images or an chest X-ray.[1] There are two types of nodules one is a benign and second one is a malignant. A nodule with diameter 3 cm or less is called a Pulmonary or non-cancerous nodule. These nodules are also called as benign. A nodule whose diameter is larger than 3 cm is poisonous and called as malignant nodule. Malignant nodule should be identified as early possible because it is likely to be cancerous nodule. To check whether these nodules are expanding, they are needed to be observed over the time. If there is a change in the size of nodule and it is growing then there is a probability of getting cancer. So, a nodule should be observed. [2] As compared with other types of cancer, the long term endurance rate of lung cancer patient is very lo w. So, the identification of lung cancer at early stage is very important and it provides vital research platform in med ical image processing field

**LITERATURE SURVEY:**

**Lung Nodule Detection Using Image Segmentation Methods**

**AUTHOR: Nanusha**

**Abstract:**

The detection and segmentation of lung nodules based on computer tomography images (CT) is a basic and significant step to achieve the robotic needle biopsy. In this paper, we reviewed some typical segmentation algorithms, including thresholding, active contour, differential operator, region growing and watershed. To analyse their performance on lung nodule detection, we applied them to four CT images of different kinds of lung nodules. The results show that thresholding, active contour and differential operator do well in the segmentation of solitary nodules, while region growing has an advantage over the others on segmenting nodules adhere to vessels. For segmentation of semi-transparent nodules, differential operator is an especially suitable choice. Watershed can segment nodules adhere to vessels and semi-transparent nodules well, but it has low sensitivity in solitary nodules

**Segmentation and Image Analysis of Abnormal Lungs at CT: Current Approaches, Challenges, and Future Trend**

**AUTHOR: Awais Mansoor Ph.D et al,**

**Abstract:**

Our aim is to review and explain the capabilities and performance of currently available approaches for segmentation of lungs with pathologic conditions on chest CT images, with illustrations to give radiologists a better understanding of potential choices for decision support in everyday practice. The computer-based process of identifying the boundaries of lung from surrounding thoracic tissue on computed tomographic (CT) images, which is called segmentation, is a vital first step in radiologic pulmonary image analysis. Many algorithms and software platforms provide image segmentation routines for quantification of lung abnormalities; however, nearly all of the current image segmentation approaches apply well only if the lungs exhibit minimal or no pathologic conditions. When moderate to high amounts of disease or abnormalities with a challenging shape or appearance exist in the lungs, computer-aided detection systems may be highly likely to fail to depict those abnormal regions because of inaccurate segmentation methods. In particular, abnormalities such as pleural effusions, consolidations, and masses often cause inaccurate lung segmentation, which greatly limits the use of image processing

methods in clinical and research contexts. In this review, a critical summary of the current methods for lung segmentation on CT images is provided, with special emphasis on the accuracy and performance of the methods in cases with abnormalities and cases with exemplary pathologic findings. The currently available segmentation methods can be divided into five major classes: (a) thresholding-based, (b) region-based, (c) shape-based, (d) neighboring anatomy–guided, and (e) machine learning–based methods. The feasibility of each class and its shortcomings are explained and illustrated with the most common lung abnormalities observed on CT images. In an overview, practical applications and evolving technologies combining the presented approaches for the practicing radiologist are detailed.

**EXISTING SYSTEM :**

The important step in the identification of lung cancer is detection of nodule. Image enhancement pre-processing is done again before extracting desired nodules. The image boundary connected objects are cleared. The gray thresholding for b inarizat ion, image background techniques are used for image pre-processing. Reg ion based algorith m is used to segment the nodules from lung. Nodule with area between 75 p ixels and 1000 p ixe ls is identified and segmented for further process

**PROPOSED SYSTEM :**

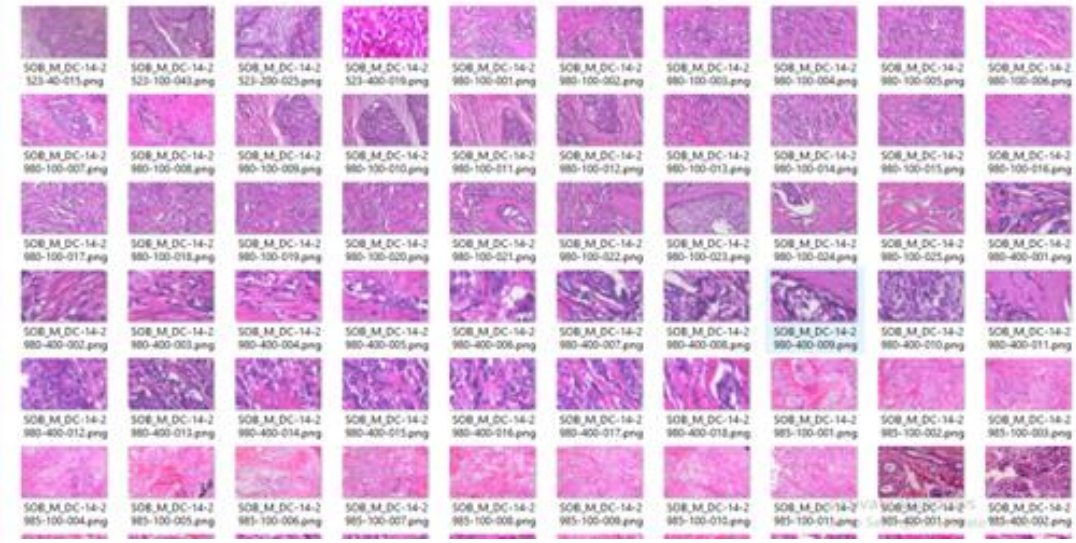
The median filter is generally used to diminish noise in an image. In the image, the median filter checks its nearby pixel to decide whether that neighbouring pixel is similar or not. In this filter it replaces pixel value with its neighbouring median pixel values. Histogram equalization technique is used to adjust image intensity to enhance contrast. It is the graphical interpretation of the image's pixel intensity values. It can be interpreted as the data structure that stores the frequencies of all the pixel intensity levels in the image.

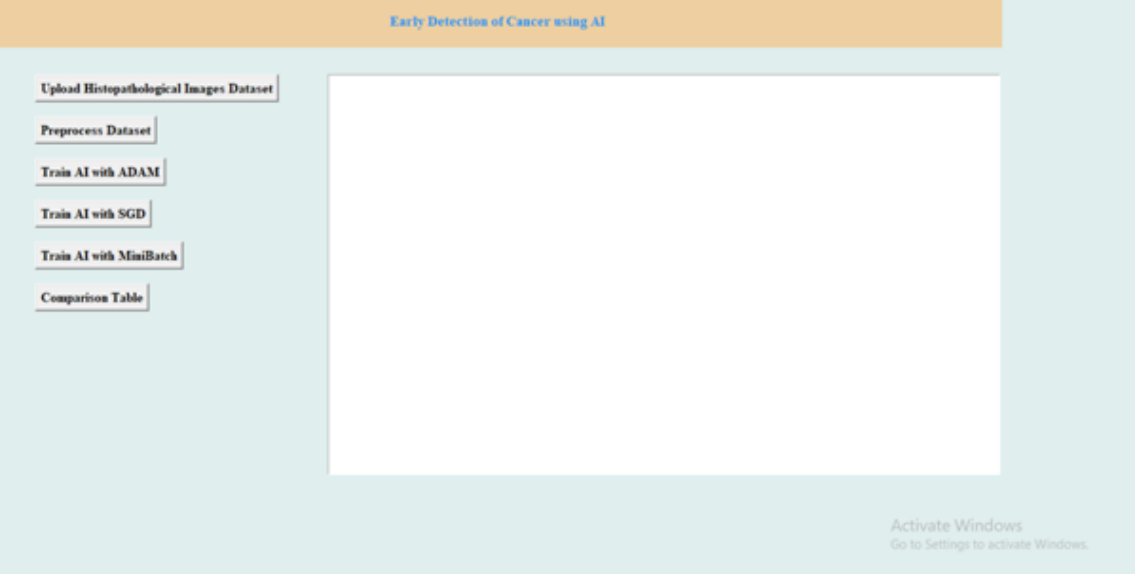
**IMPLEMENTATION:**

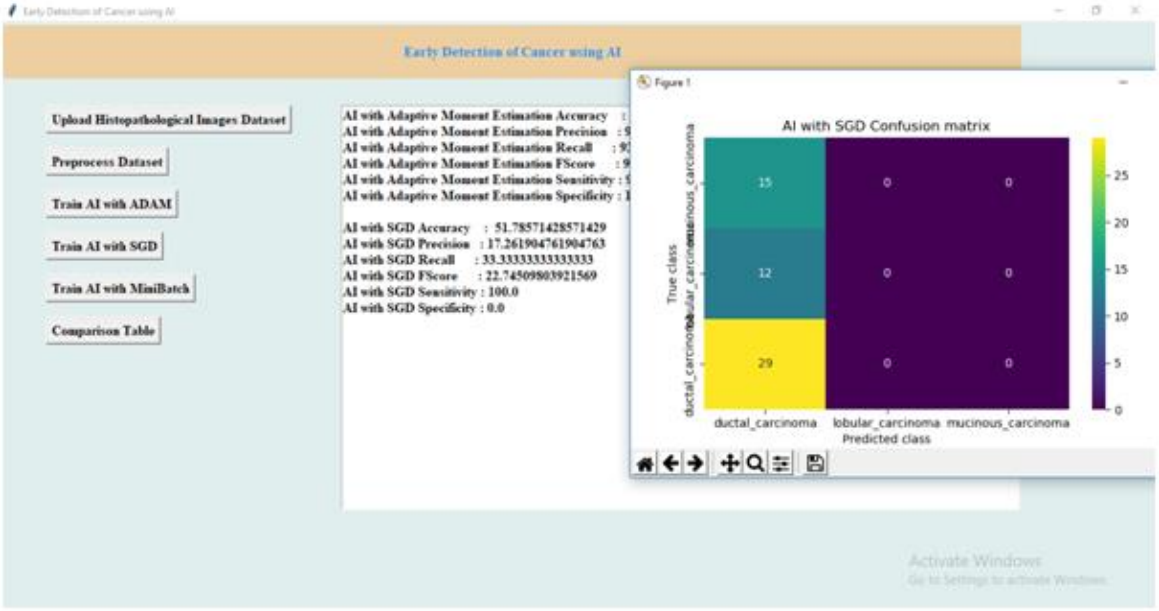
**MODULES:**

- upload MRI images dataset : use this button to get upload images.
- Generate images train & test model : use this button to get generate images train & test model.
- Generate deep learning CNN model : use this button to get deep learning CNN model.
- Get drive HQ images: using this button to get open drive HQ
- Predict tumor :use this button to get predict tumor.

**SCREEN SHOTS**








**CONCLUSION:**

The CA D Systems are beneficial to detect cancerous nodules& have a lot to offer to modern med icine. A nodule is identified with required area by using circle fit algorith m with maximu m rad ius which eliminates the unnecessary selection of wrong nodules. After every iteration, we get more accurate results. This led the system to provide Accuracy of 95.6%. The Sensitivity & Specificity of the system is 93.1% &100% respectively. Based on CT images, this system will give accurate and effective result of lung nodule detectionas benign or malignant lung nodule. In Future work, this system will help to diagnose cancer in different organs of human body. Techniques used in this system can be imp lemented in reducing the growth of abnormal cells or spreading to other parts of body. This system can be enhanced for MRI and Ultrasound images. The results obtained from A NN classifier are mo re precise and accurate but it requires more number of data inputs as compared with SVM classifier.

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