A COMPUTER BASED DETECTION OF LUNG NODULES IN CHEST RADIOGRAPHS

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Introduction

- Lung cancer is the leading cause of cancer death in the United States.
- Lung cancer usually exhibits its presence with the formation of pulmonary nodules.
- Nodules are round or oval-shaped growth present in the lung.
- Chest radiographs are used by radiologists to detect and treat such nodules, but nodules are quite difficult to detect with human eye.
- Computer Aided Detection (CAD) applied to such data would be very essential and will be of valuable help in lung cancer screening.

FlyerScan CAD Algorithm

The algorithmic steps of the CAD system include:
- Local contrast enhancement
- Automated anatomical segmentation
- Detection of nodule candidates
- Feature extraction
- Candidate classification

Methodology

- Here, proposed FlyerScan algorithm is implemented for Lung Image Database Consortium (LIDC)- Image Database Resource Initiative (IDRI).
- Algorithm is trained and tested using specific sets from the LIDC-IDRI database.
- CAD system is trained based on the centroid of nodules provided by at least one of four board certified radiologists.
- In this research, we later explore into new set of classes and features.

Results

![Figure 2: Original chest radiograph](image)

![Figure 3: Local Contrast Enhancement on original chest radiograph](image)

![Figure 4: Lung Segmentation applied on Local contrast enhancement image](image)

![Figure 5: Lung segmentation with centroid of nodules provided by radiologists](image)

Future Work

- To explore into a new set of features and classes that would aid in nodule classification for each patient.
- To improve the efficiency of existing FlyerScan CAD algorithm

References