

平成19年度修士論文

題目 : Automatic Detection of GGO Candidate Regions Employing Selective Enhancement Filter from the Thoracic MDCT Images

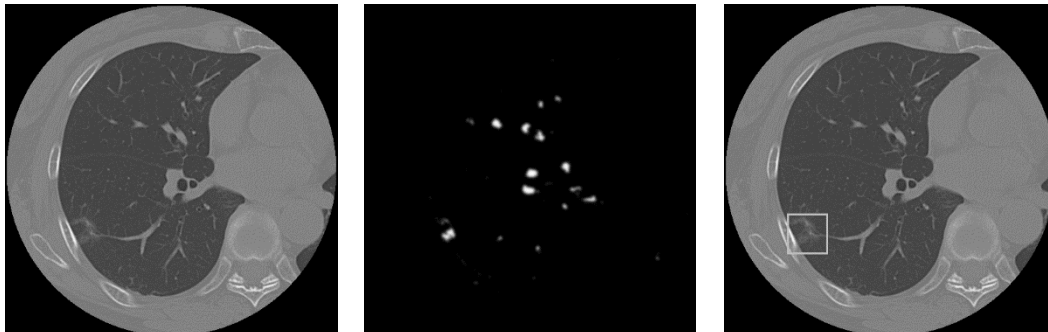
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Lung cancer is the leading cause of cancer death in men and women in the United States. Experts estimate that there will be 213,380 new cases of lung cancer in 2007, 114,760 cases in men and 98,620 cases in women. 160,390 Americans are expected to die of the disease, 89,510 men and 70,880 women. The lung cancer occurs most often between the ages of 55 and 65. There are two major types of lung cancer, non-small cell lung cancer and small cell lung cancer. Each type of lung cancer grows and spreads in different ways, and each is treated differently.

The computer aided diagnosis (CAD) is a method for detecting the lung abnormalities and tumors by use of a special X-ray at a very early stage. In recent years, optical devices produce digital images, such as CT or MRI that are highly efficient for extracting the abnormal shadows in the medical image processing field. The computed tomography (CT) technology has proven to be a very successful tool for medical diagnosis. The multi-detector row CT (MDCT) system also known as the Multi Slice CT (MSCT) provides a large volume of scanning with good image quality, and at very short time of acquisition (patient's breath-hold duration). Therefore, we are now able to obtain the good resolution images with better than the past. Especially, high resolution computed tomography (HRCT) is a proved imaging modality for evaluation of patients with some diseases or abnormal shadow areas, and medical doctors can easily detect it. In addition, short exposure time of MDCT may reduce the dosage for patients. However, a large number of CT images should be increased for the visual screening. At the same time, quantification of abnormal area is also desired by medical region. Therefore, many CAD systems are developed for supporting to the medical doctors by using the medical image processing technique.

The aim of this study is segmentation of lungs region and detection of abnormal area using thoracic MDCT image. In this study we also develop a method for detecting the GGO candidate region by using statistical features from an image set which is obtained by selective enhancement filter. This study also tried to decrease the amount of false positive rate and increase the amount of true positive

rate so that the accuracy of ground glass opacity from lungs region is developed.



実験結果