

## A SEGMENTATION METHOD OF LUNG AREAS BY USING SNAKES AND AUTOMATIC DETECTION OF ABNORMAL SHADOW ON THE AREAS

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**ABSTRACT.** *Segmentation for lung areas from CT images is an important task on understanding tissue construction, computing and detecting the abnormal shadow areas. Recently, many segmentation methods based on contour model are presented. SNAKES (active contour model), on the other hand, are used extensively in computer vision and image processing applications particularly to locate the object boundaries. In lung segmentation, SNAKES is used for extracting the detail of region of interest. However, a completely automatic segmentation method is not yet established, since it needs some manual efforts for initial contouring and constructing the contour models. In this paper, we propose a new segmentation method for lung areas by using SNAKES method without considering any manual operations. Furthermore, abnormal shadow areas including ground-glass opacity or lung cancer is classified by using voxel density on the CT slice image set. Experiment is performed employing nine thorax CT image sets and satisfactory results are obtained. Obtained results are shown along with some discussion.*

**Keywords:** Thorax MDCT, Segmentation, SNAKES, Ground-glass opacity, Region of interest, Computer aided diagnosis

**1. Introduction.** Recently, optical devices produce digital images, such as CT or MRI that are highly efficient for extracting the medical image region. Therefore, we are now able to obtain the images with better resolution than the past. High resolution computed tomography is a proved imaging modality for evaluation of patients with some disease or abnormal shadow areas, and a medical doctor can easily detect it. In addition, short exposure time of MDCT (Multi Detector-row Computed Tomography) may reduce the dosage for patients. However, a large number of test images should be increased for the convenience. At the same time, quantification of abnormal area is also desired by medical region. Therefore, CAD (Computed Aided Diagnosis) system is developed/proposed for medical image processing.

Various imaging techniques are proposed in the field of pulmonary complaints CAD. Especially, to segment the lung area and recognize abnormal area on CT images, some techniques are proposed [1-6]. But segmenting the region of interest (ROI) based on CT