AbstractID: 1357 Title: Automated Lung Segmentation in Thoracic MR Scans

Segmentation of critical structures within thoracic magnetic resonance (MR) scans is a necessary step in computer-based detection and/or evaluation of disease extent. Segmentation of the lungs in MR scans is complicated by potentially significant cardiac motion artifacts. We have developed an automated method for the segmentation of lungs that accounts for such artifacts. First, the thorax is segmented using a threshold obtained from the gray-level profile along a line from the center of the image to its edge. The segmented thorax is used to create two separate lung segmentation images. The first is created using histogram-based gray-level thresholding techniques applied to the segmented thorax. To include artifact-corrupted lung regions within the lung boundary, a second lung segmentation image is created by first applying a grayscale erosion operator to the segmented thorax followed by histogram-based gray-level thresholding techniques. A logical OR is used to combine the two lung segmentation images. The automated method was applied to 10 thoracic MR scans from mesothelioma patients. Only those sections above the diaphragm were considered, resulting in 144 sections for segmentation. A radiology resident evaluated the segmented lung regions in each section (288 lung regions) using a five-point scale (from "highly accurate segmentation" to "highly inaccurate segmentation"). Eighty-five percent (n=244) of the lung segmentation regions were assigned to one of the top two rating categories: highly or moderately accurate. S.G.A shareholder R2 Technology, Inc.