

Wavelet Based ROI Lossless Medical Image Watermarking Scheme

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Abstract—

I. INTRODUCTION

II. DATA

III. METHODOLOGY

A. ROI segmentation

In our scheme, ROI is defined by the lung area of CT image and we implemented zero watermarking to this part to achieve perfect reconstruction. The automated segmentation of ROI is based on the morphological reconstruction and the connected component analysis. We first applied the hole-filling algorithm to get the rough region of Lung and removed the fake objects (like trachea, noise) according to the area of the connected components ($800 \leq N_{pixels} \leq 100000$). The morphological close operation was performed to fill the gaps inside the lung region (Fig. 1). The ROI we acquire from segmentation would be used in specify the bitwise processing region in image.

$$I_w = ROI^c \otimes Key$$

Where $I_w(x, y) \in \{0, 1\}$ is an indicator of the processed position. The corresponding watermarking position of level L in wavelets domain can be determined by just down-sampling by 2^{L-1} .

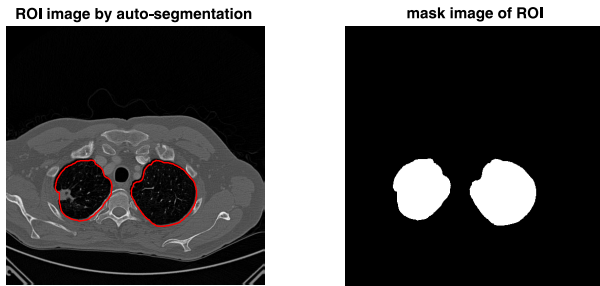


Fig. 1. Illustration of ROI in CT image. left: boundary of ROI. right: mask of lung region

IV. RESULTS

V. FUTURE STEPS

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REFERENCES

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