

Abdominal Organ Segmentation in CT Images Based On Watershed Transform and Mosaic Image

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Abstract : Accurate Liver, spleen and kidneys segmentation in abdominal CT images is one of the most important steps for computer aided abdominal organs pathology diagnosis. In this paper, we have proposed a new semi-automatic algorithm for Liver, spleen and kidneys area extraction in abdominal CT images. Our proposed method is based on hierarchical segmentation and watershed algorithm. In our approach, a powerful technique has been designed to suppress over-segmentation based on mosaic image and on the computation of the watershed transform. The algorithm is currency in two parts. In the first, we seek to improve the quality of the gradient-mosaic image. In this step, we propose a method for improving the gradient-mosaic image by applying the anisotropic diffusion filter followed by the morphological filters. Thereafter we proceed to the hierarchical segmentation of the liver, spleen and kidney. To validate the segmentation technique proposed, we have tested it on several images. Our segmentation approach is evaluated by comparing our results with the manual segmentation performed by an expert. The experimental results are described in the last part of this work.

Keywords : anisotropic diffusion filter, CT images, morphological filter, mosaic image, multi-abdominal organ segmentation, mosaic image, the watershed algorithm

Conference Title : ICBES 2015 : International Conference on Biomedical Engineering and Systems

Conference Location : Paris, France

Conference Dates : March 30-31, 2015