Computer-aided detection of simultaneous abdominal organ from CT images based on iterative watershed transform

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Abstract

The interpretation of medical images benefits from anatomical and physiological priors to optimize computer-aided diagnosis applications. Segmentation of the liver, spleen, and kidneys is regarded as a major primary step in computer-aided diagnosis of abdominal organ diseases. In this paper, a semi-automated method for medical image data is presented for abdominal organ segmentation data using mathematical morphology. Our proposed method is based on a hierarchical segmentation and watershed algorithm. In our approach, a powerful technique has been designed to suppress over-segmentation based on a mosaic image and on the computation of the watershed transform. Our algorithm is currently 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, Simultaneous organ segmentation, Watershed algorithm.

1. Declaration of conflicts

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2. Authors' biography

No Biography

3. References

No reference