

Automatic LV Segmentation with K-means Clustering and Graph Searching on Cardiac MRI

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Abstract : Quantification of cardiac function is performed by calculating blood volume and ejection fraction in routine clinical practice. However, these works have been performed by manual contouring, which requires computational costs and varies on the observer. In this paper, an automatic left ventricle segmentation algorithm on cardiac magnetic resonance images (MRI) is presented. Using knowledge on cardiac MRI, a K-mean clustering technique is applied to segment blood region on a coil-sensitivity corrected image. Then, a graph searching technique is used to correct segmentation errors from coil distortion and noises. Finally, blood volume and ejection fraction are calculated. Using cardiac MRI from 15 subjects, the presented algorithm is tested and compared with manual contouring by experts to show outstanding performance.

Keywords : cardiac MRI, graph searching, left ventricle segmentation, K-means clustering

Conference Title : ICCAIP 2015 : International Conference on Computer Analysis of Images and Patterns

Conference Location : Madrid, Spain

Conference Dates : March 26-27, 2015