عنوان مقاله:

A Novel Method for Heart localization in Short Axis Cardiac Magnetic Resonance Images

محل انتشار:

کنفرانس بین المللی مهندسی و فن آوری اطلاعات (سال: 1396)

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نویسندگان:

Nasrin Bastani - *Computer engineering school, Islamic Azad university of Najafabad/ Advanced medical technology school, Isfahan university of medical science*

Saeed Kermani - *Advanced medical technology school, Isfahan university of medical science*

خلاصه مقاله:

Cardiac Magnetic Resonance (CMR) imaging system is one of the most popular noninvasive modalities to monitor and evaluate cardiac function. This evaluation generally is being done by measuring cardiac characteristics like left ventricle volume, left ventricle mass, ventricular enlargement or ejection fraction. Extraction of heart, left ventricle or right ventricle as an object in these images, named segmentation, is the only way to obtain these cardiac characteristics. The first step toward many cardiac segmentation algorithms is heart localization. A strong heart localization method provides a useful prior knowledge, for the segmentation algorithm to determine seed points and pixels to study on. It leads us to a full automatic segmentation algorithm with a high precision and accuracy because of limiting the algorithm to be executed only on the heart and near-heart pixels and increases the speed of segmentation process because of using less pixels. In this paper, we introduce a new algorithm for heart localization in short axis CMR images that uses the theory that heart is the only moving organ in these images. We identify moving edges using a compound method of Canny edge detection and Kmeans classifier and then we localize the heart using boundary tracing. The evaluations show our method has the ability of recognizing more than 99 presents of pixels related to heart object and the most largeness of identified area from manual segmentation of the whole heart is not more than 8 pixels.

کلمات کلیدی:

Short axis CMRI, Heart localization, Canny edge detection, Kmeans classification