عنوان مقاله:

3D Automatic Segmentation of Coronary Artery Based on Hierarchical Region Growing Algorithm (3D HRG) in CTA Data- sets

محل انتشار:

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خلاصه مقاله:

Nowadays one of the most important causes of mortality is cardiovascular disease, especially coronary artery stenosis. Therefore, it is important to find an accurate and fastway to diagnose them. Computed tomography angiography is a non-invasive imaging method for the heart and its vessel, whichcan be used instead of angiography in many cases. Indeed, themain focus is on developing an automatic method which can be asaccurate as angiography with the least user's contribution.Automatic coronary artery segmentation is considered as the first step to reach this goal. Therefore, a hierarchical region growingalgorithm is proposed in which the whole heart region vessels, aorta, left ventricle and other cardiovascular vessels aresegmented for the purpose of coronary artery segmentation. Our method validation is assessed by a radiologist through comparingthe results with manual segmentation of him. Proposed method's results are 86.81% in average similar to radiologist's segmentation in kappa statistic and its label consistency withradiologist's segmentation is 90.23%. Comparing to other methods, our method is automatic and both left and rightcoronary can be segmented in all data-sets. It also segments important branches of coronary artery. According to the radiologist comments and high similarity measure, proposed method is reliable and applicable.

کلمات کلیدی:

automatic coronary artery segmentation , computed tomography angiography , 3D region growing algorithm , cardiovascular disease