



Cardiovascular Segmentation Based on Hough Transform and Heuristic Knowledge

Zahra Turani ^a, Reza A. Zoroofi ^a, Shapoor Shirani ^b, Sara Abkhofta ^a

^a University of Tehran, Iran; ^b Radiology Department, School of Medicine, Tehran University of Medical Science, Iran

Nowadays cardiovascular diseases are one of the most major causes of mortality. Computed Tomography Angiography (CTA) is a very useful imaging tool to diagnosis cardiovascular disease. So it is important to analyze the CTA images well. This paper proposed a new method for fully automatic cardiovascular segmentation based on combination of Hough transform and region growing algorithm. It is a robust method which segments ascending aorta, descending aorta, and left ventricle concurrently. Comparing to the manual method which is done by cardioradiologist and previous automatic and semi- automatic works, our method is faster, more accurate, and fully automatic. This procedure also can be applied to coronary segmentation. The validation of the acquired cardiovascular images is evaluated by cardioradiologist. By evaluating 10 datasets, which contain about 5000 images, the accuracy of the method is 100% comparing to the gold standard. Our gold standard is the images segmented by cardioradiologist.

