

Coronary artery segmentation in angiograms with pattern recognition techniques - a survey

ABSTRACT

Medical image processing is nowadays one of the best tools to make an informative model from a raw image of each part of the body, and segmentation is the most important step in which used to extract significant features. Coronary artery segmentation algorithm in angiograms is a fundamental component of each cardiac image processing system. There are lots of techniques and algorithms proposed for extracting coronary arteries in angiograms. But based on our knowledge, there is not any review paper to categorize and compare them together. In this paper, we have divided these algorithms into five major classes and propose a survey for the main class, pattern recognition, which is a famous technique in this manner. We studied all the papers in the pattern recognition class and defined six categories for them: (1) Multi scale approaches (2) Region growing approaches (3) Matching filters approaches (4) Mathematical morphology approaches (5) Skeleton based approaches and (6) Ridge based approaches. Finally, we made a table to compare all the algorithms in each category against criteria such as: user interaction, angiography types, dimensionality, enhancement method, full coronary artery output, whole tree output, and 3D reconstruction ability.

Keyword: Medical image processing; Image segmentation; Coronary artery segmentation; Angiogram; Pattern recognition; Survey