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Innovations in CT Angiography Image Analysis: Machine Learning Methods for Plaque Segmentation

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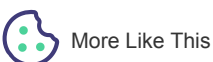
Abstract:

Segmentation is a common method for processing medical imaging in the present medical field. These techniques are used to provide computer-aided diagnosis (CAD) and pin point Region of Interest (ROIs) that are essential for examining a patient's symptoms and overall condition. Medical imaging is one of the main areas where this technology is used, and segmentation may automatically highlight the objects (such as vessels, cardiac chambers, etc.) which aids doctors for the disease diagnosis. Coronary Computed Tomography Angiography(CCTA) is a diagnostic process used by medical professionals to find heart vessel problems. In this proposed method, we first segment the cardiac vessel regions of interest before moving on to categorization. In the proposed work, we use simple segmentation algorithms to automatically recognize areas of occlusion by examining Coronary Computed Tomography Angiography (CCTA) images.

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I. Introduction

Early detection and treatment of coronary artery disease may reduce the possibility of having a heart attack. Evaluating cardiovascular diseases, coronary computed tomography angiography (CCTA) is a widely accepted non-invasive method. With the use of CCTA imaging, the coronary arteries are clearly seen. Radiologists study these images and analyze the coronary arteries for the expected narrowing of vessels[1]. In addition to evaluating the severity of stenosis, CCTA provides a non-invasive method to comprehensively quantify atherosclerosis in the entire heart. With advancements in CT technology, it is now possible to semi-automatically measure coronary atherosclerotic plaque with high level accuracy, comparable to intravascular ultrasound [2]–[5].

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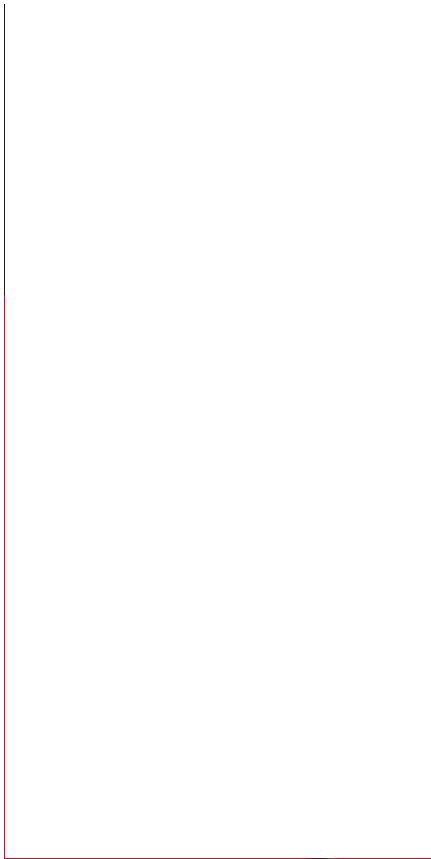
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