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Vessel Cross-Sectional Area Measurements Using CT Angiography

Tech ID: 28767 / UC Case 2017-409-0

BRIEF DESCRIPTION

A new approach to visualizing small and stenotic vasculature not readily visible with modern day diagnostic computed tomography angiography.

FULL DESCRIPTION

Coronary computed tomography angiography is a commonly utilized imaging technique to visualize a patient's vasculature and potential vascular narrowing. Unfortunately, computed tomography angiography is unable to resolve small vessel cross-sectional area with a diagnostic accuracy of 50%. To overcome such shortcomings, vessel identification can be improved by a semi-automatic thresholding methodology. However, this method is highly dependent on the vessel size such that stenosis severity would be underestimated or overestimated based on the threshold selected. To address vessel measurements affected by arterial calcification, a pre-contrast image can be subtracted from a post contrast CT image to remove the unwanted artifact. Yet again, this method is not perfect and is limited by patient motion artifacts in between CT scans that yield inaccurate background subtraction. Clearly, an accurate and robust method that can measure vessel cross-section area (CSA) and stenosis severity in coronary CT angiography would be desirable.

UCI researchers have created a simple signal processing methodology that calculates the CSA of vessels. The method circumvents the problems associated by low resolution computed tomography systems at the voxel level by analyzing the conserved total signal in each area of interest. The proposed method improves the precision and accuracy of identifying small and narrowed vasculature by a factor of two and three, respectively.

SUGGESTED USES

- » Identify small or stenotic blood vessels that wouldn't be resolvable due to the current resolution limit in modern day computed diagnostic computed tomography

ADVANTAGES

- » Accurate measure vessel cross sectional diameter regardless of whether the size is too small to resolve.
- » Proper medical intervention based on CT angiography results

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,898,150	01/26/2021	2017-409

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OTHER INFORMATION

CATEGORIZED AS

- » **Imaging**
 - » Medical
- » **Medical**
 - » Diagnostics
 - » Disease: Cardiovascular and Circulatory System
 - » Imaging
 - » Screening

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2017-409-0

STATE OF DEVELOPMENT

The technology resides in the research and develop phase.

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