CAROTID TOOLS

PLAQUE ANALYSIS

SEMI-AUTOMATIC US-MRI REGISTRATION

D.O.R. Carvalho et al., Registration of Full-Hand Ultrasound and MRI of Carotid Artery through Combination of Point-Based and Intensity-Based Algorithms, British Medical Image Registration, 2012

PLAQUE CHARACTERIZATION CTA+MRI

A van Dongen et al., Supervised/Unsupervised plaque characterization incorporating class label uncertainty, SPIE, 2012

CAROTID SEGMENTATION IN MRI

Automatic segmentation of vessel lumen and outer vessel wall of the carotid artery from MRI images

QUANTITATIVE MRI

Acquire multiple images with different settings and fit theoretical signal curve to acquire T1 and T2. Maximum Likelihood estimation with Rician noise model. A T1 or T2 map shows these tissue specific physical properties for each voxel.

DISTENSIBILITY FROM CTA

Vessel distensibility is a marker for atherosclerotic disease

EVALUATION FRAMEWORKS

For standardized quantitative comparison of coronary artery centerline extraction algorithms

SMARTVIS COMBINED VISUALIZATION

Combined perfusion MRI and CTA based information visualization

CORONARY ARTERY REGISTRATION

2D/3D x-ray angiography to CTA registration

3D/3D coronary centerline registration for improved guidance during percutaneous coronary intervention (PCI)

CAROTID TOOLS

HEART SEGMENTATION AND MODELING

HEART SEGMENTATION FROM CTA

Automatic, atlas based heart chamber segmentation from CTA.

HEART SHAPE AND MOTION MODEL

8 manually segmented end-diastolic CTA datasets

EPICARDIAL FAT QUANTIFICATION FROM CT

Automatic and manual fat quantification by atlas based segmentation

CORONARY ARTERY SEGMENTATION

CORONARY ARTERY SEGMENTATION IN CTA

Semi-automatic coronary centerline extraction from CTA images (centerline from aorta to manually selected end point)

CORONARY CALCIUM SCORING

Automatic vessel specific Agatston, calcium mass and volume scoring from CT

CORONARY STENOSIS DETECTION & QUANTIFICATION

Automatic stenosis detection, quantification and segmentation from CTA images. Requires artery lumen segmentation.

The focus of our group is image processing. For a complete list of topics see www.bigr.nl

If you have further project ideas, or would like to collaborate, please contact Prof. Wiro Niessen (w.niessen@erasmusmc.nl)

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Combined perfusion MRI and CTA based information visualization

Combined SPECT and CTA visualization

Combined perfusion MRI and CTA based information visualization

Combined SPECT and CTA visualization

HA Kirisli et al., Comprehensive Visualization of Multimodal Cardiac Imaging Data for Assessment of Coronary Artery Disease: First Clinical Results of the SMARTVis Tool, IJCARS, 2012

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