

Mapping color data on the heart

OsiriX Foundation

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1 General Conditions

Please refer to <http://www.osirixfoundation.com/awards.html> for General Conditions.

2 Category

This document describes a **Category 2** Plugin Award Project.

3 Description

3D anatomical images of the heart can be obtained with high precision from contrast cardiac CTA obtained from multidetector CT scanners (MDCT). It is often desirable to be able to map on the surface of the heart, information regarding blood perfusion and myocardial metabolism obtained from other imaging modalities such as cardiac scintigraphy or PET scans. This allows users to better identify the physical location of some anomalies of the heart and how they relate to coronary arteries on the surface of the heart. To do so, data from these other modalities can be color-coded according to a predefined color scale and then painted on the surface of the heart. This can be achieved by registration of the 3D data obtained from functional images with the anatomy of the heart on the CTA images. While simple fusion using transparency parameters generate relatively poor quality images, it is desirable that the myocardium itself be colored with the corresponding parametric colors, and be displayable in 3D.

4 Requirements

The goal of this plugin is to provide a tool that allows to math data from high resolution CT with data from SPECT or PET images of the heart. The challenge of this tools is to develop an innovative color blending technique allowing to paint the information on the voxels of the heart while maintaining the rest of

the structures outside the heart and coronary arteries unaffected. The plugin should allow:

- Fast automatic identification and segmentation of the left ventricular region of the heart and the coronary arteries.
- Semi automatic alignment of 3D data from functional studies with the anatomical images (with manual adjustments and registration if necessary)
- Color mapping of the parametric data on the morphological images of the left ventricle of the heart
- Rendering of the color-coded image in 3D using the volume rendering tool of OsiriX

5 Deliverable

1. A fully functional plugin that can perform the semi-automatic registration of functional data of the heart with a 3D CTA study of the heart
2. Generation of a set of images with colored myocardium that can be manipulated in 3D and viewed from different sides in the standard 3D volume rendering tool of OsiriX
3. Ability to generate movies of the rendered heart using the fly through feature of OsiriX.

6 Contact

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