

Segmentation of abdominal aortic aneurysms

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

Contrast CT angiograms of the abdomen provide high resolution images of the abdominal aorta and its branches. In case of abdominal aneurism, pre-surgical planning depend on specific measurements of the aneurism and its morphology. Parameters such as the aneurism maximum diameter, its length along the aorta, the size of the entry and exit lumen, the presence of intraluminal thrombus or calcifications are essential for therapeutic decisions and for subsequent surgical treatment.

Simple image segmentation algorithms along a centerline of the abdominal aorta should allow to easily identify the vessel lumen, the external walls and the presence of parietal thrombus and calcification. Color-coded volume of interest of these different components is required for easy interpretation by surgeons and treating physicians. Automatic calculation of basic dimensions and morphological characteristics are also needed.

4 Requirements

The goal of this plug-in is to provide an automatic segmentation of the abdominal aorta and the identification of the different layers of the vessel (inner lumen, external surface of the vessel, thrombus in the vessel wall and calcifications.

- Users should identify the center of the aortic aneurysm and select the proximal and distal limits of the vessel that need to be evaluated

- Program should then automatically generate volumes of interest (VOIs) based on OsiriX internal ROI polygons in each image that can be manually edit by the user if needed.
- A summary result window will show the segmented aorta flattened in two views: coronal and sagittal along the centerline. Interactive cursors should allow the user to display the vessel diameter at each point along the segment being analyzed. Key parameters such as maximum diameter of the aneurysm, the length and starting and ending lumen diameters should be calculated automatically and displayed. The result window should be exportable in PDF or DICOM format.
- Color-coded VOIs will also be displayed with different degree of transparency over the standard volume rendered image of the original data

5 Deliverable

1. A fully functional plug-in that can be automatically perform the segmentation of the abdominal aorta (see above for details)
2. Generation of a result window with a synthetic view of the results that can be exported in PDF or DICOM format
3. Segmented parts of the aorta will be generated in the standard OsiriX ROI format that can be displayed in the 3D volume rendering tools of the program.

6 Contact

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