Automatic LA Scar Detection

Greg Gardner, Alan Morris, Danny Perry, Josh Cates
SCI Institute/CARMA Center
University of Utah

ggardner@sci.utah.edu | 801.585.0649

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Learning Objective

Automatic left atrial (LA) scar detection in Slicer
Background

McGann et al. JACC, 52(15): 1263-1272, 2008
Current Workflow

Acquire LGE-MRI
Manually segment LA wall
Manually segment scar
Current Workflow

Manually segment scar

Automatically segment scar

Required Materials

• **Slicer**: Release 4.1

• **Data**: CARMA Left Atrial Scar
Additional Sample Data

32 patients

http://www.insight-journal.org/midas/collection/view/197

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http://www.na-mic.org
Pre-requisite Tutorial

Data Loading and 3D Visualization

Sonia Pujol, Ph.D., Harvard Medical School
Director of Training, National Alliance for Medical Image Computing

http://www.slicer.org/slicerWiki/index.php/Documentation/4.0/Training
Platforms

Developed

Tested

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Overview

Load the module

Load the dataset

Automatic scar detection
Select View>Extension Manager in the menu bar (or push ⌘4)

If the Extension Manager isn’t revealed, see the next 2 slides; otherwise, skip them
Loading the Module

To load the Extension Manager, Select Edit > Application Settings in the menu bar (or push ⌘2)
Loading the Module

Under the Extension menu, make sure ‘Enable extension manager’ is checked
Loading the Module

Select CARMA in the sidebar and click the extensions.
Loading the Module

Restart to install the extension
Loading the Data

To load the data, select Load Data from the default ‘Welcome to Slicer’ module.
Loading the Data

Select ‘Choose Directory to Add’ in the pop-up menu
Loading the Data

Select the directory containing the CARMA-LA-Scar dataset
Loading the Data

Make sure all 3 volumes are selected and click ‘Show Options’
Loading the Data

Designate the wall and blood pool volumes as label masks, then push ‘OK’
Adjusting the Viewer

Expose the viewer options, and select the button to link the viewers.
Click the icon and select ‘Red slice only’ from the drop-down menu.
Automatic Scar Detection

Under the modules menu, select CARMA>Automatic Left Atrial Scar
Automatic Scar Detection

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### Automatic Scar Detection

#### Parameter Sets

<table>
<thead>
<tr>
<th>Parameter set</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automatic Left Atrial Scar</td>
<td>Idle</td>
</tr>
</tbody>
</table>

#### Input volumes

- MRI Image: 1-mri
- LA wall mask: 1-wall
- Blood Pool mask: 1-blood_pool

#### Output volume

- Result: Result
Automatic Scar Detection

Under the MRI Image field, select the MRI image stack (1-mri)
Automatic Scar Detection

Under the LA Wall Mask field, select the label mask of the atrial wall (1-wall)
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Under the Blood Pool Mask field, select the blood pool label mask (1-blood_pool)
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Under the Result field, select ‘Create New Volume,’ which will be named Result.
Lastly, apply the settings
Automatic Scar Detection

Wait bar indicates the process in running
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Viewer automatically updates to show the resulting label mask.

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Conclusion

Student can use the module to automatically detect LA scar in Slicer 4.1

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