Connecting IGT Device with OpenIGTLink
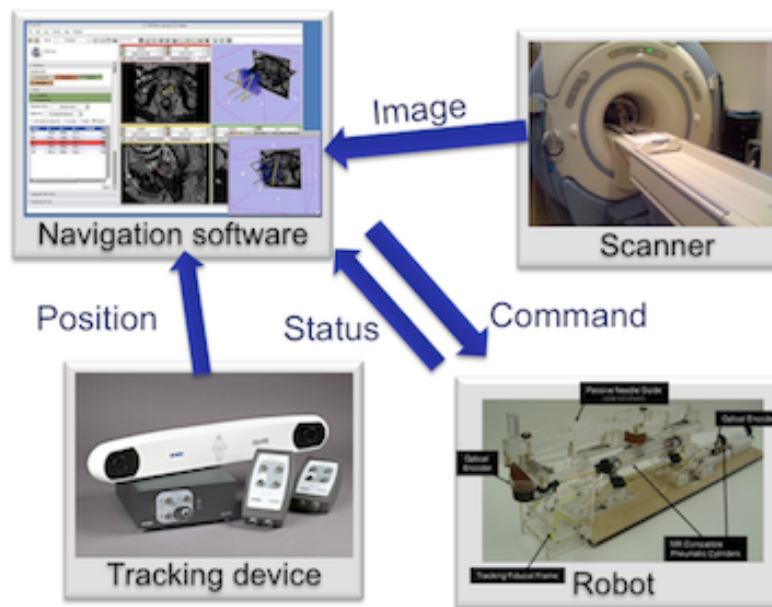

Junichi Tokuda, PhD

This course requires the following installation:

• 3DSlicer version 3.6.3 Software (Slicer3.6.3-2011-06-07), which can be installed from:

http://www.na-mic.org/Wiki/index.php/Events:2011-06-15-Robarts-Slicer-Workshop

Disclaimer

It is the responsibility of the user of 3DSlicer to comply with both the terms of the license and with the applicable laws, regulations and rules.

Learning objective

Following this tutorial, you'll be able to import tracking data from external devices (e.g. tracking system) through the network.
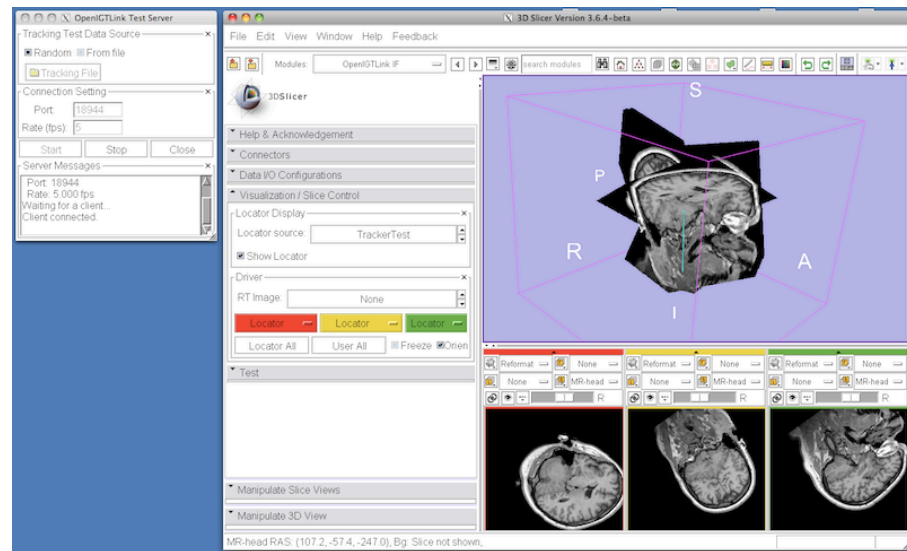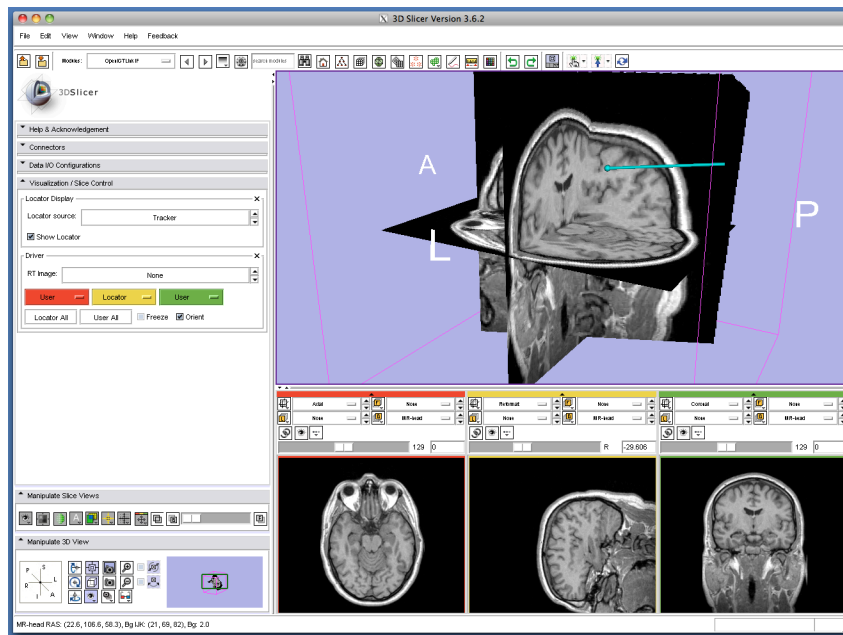
- Configuring OpenIGTLink IF module

- Setting up Test Server

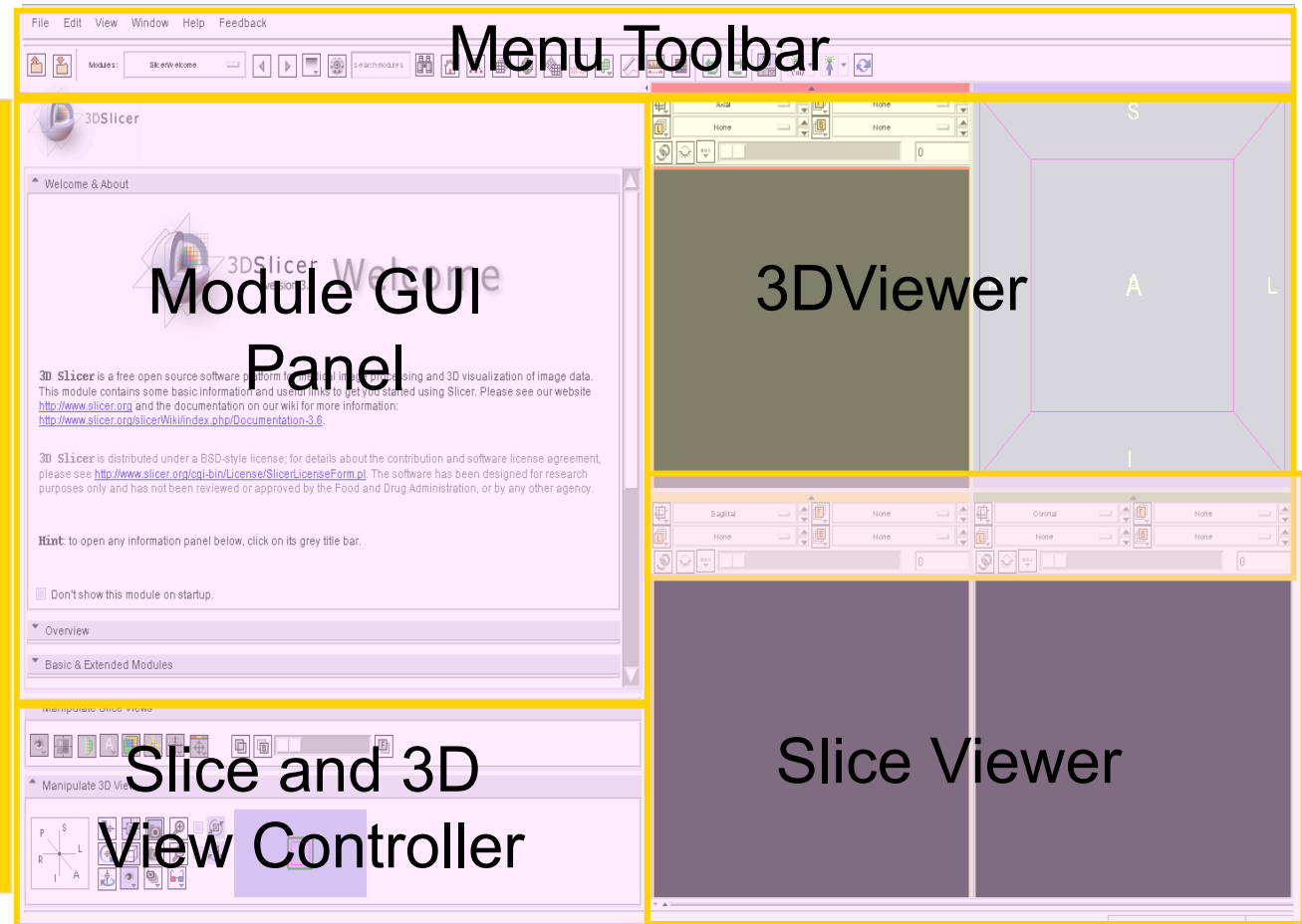- Visualizing Tracking Data

# Part 1: Configuring OpenIGTLinkIF module

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Slicer3 GUI

The Graphical User Interface (GUI) of Slicer3 integrates five components:

- the Menu Toolbar
- the Module GUI Panel
- the 3D Viewer
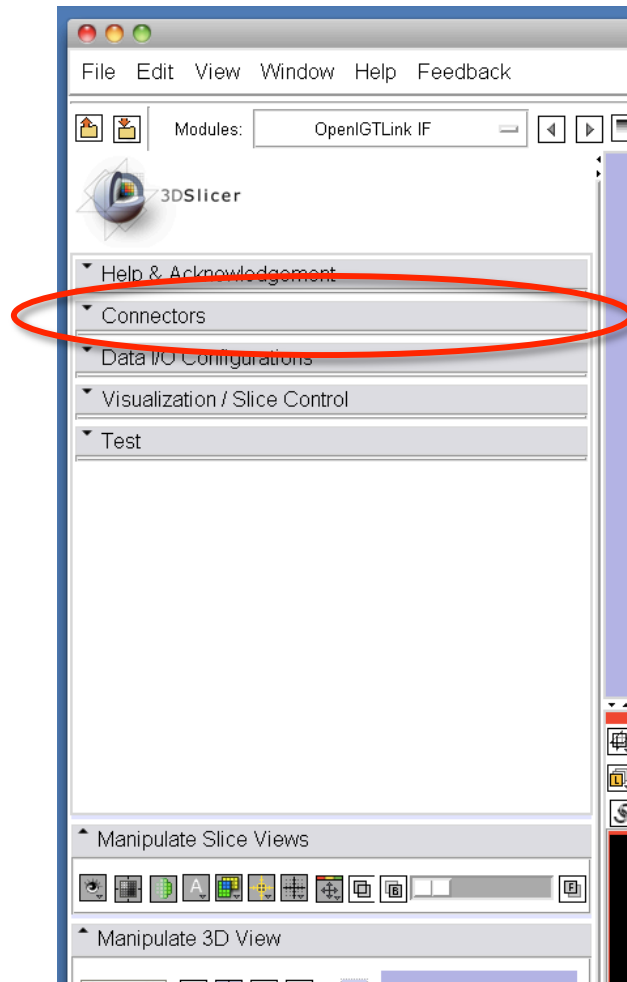- the Slice Viewer
- the Slice and 3D View Controller

Menu Toolbar

Module GUI Panel

3DViewer

Slice and 3D View Controller

Slice Viewer

Starting OpenIGTLinkIF

Select IGT ->
OpenIGTLinkIF
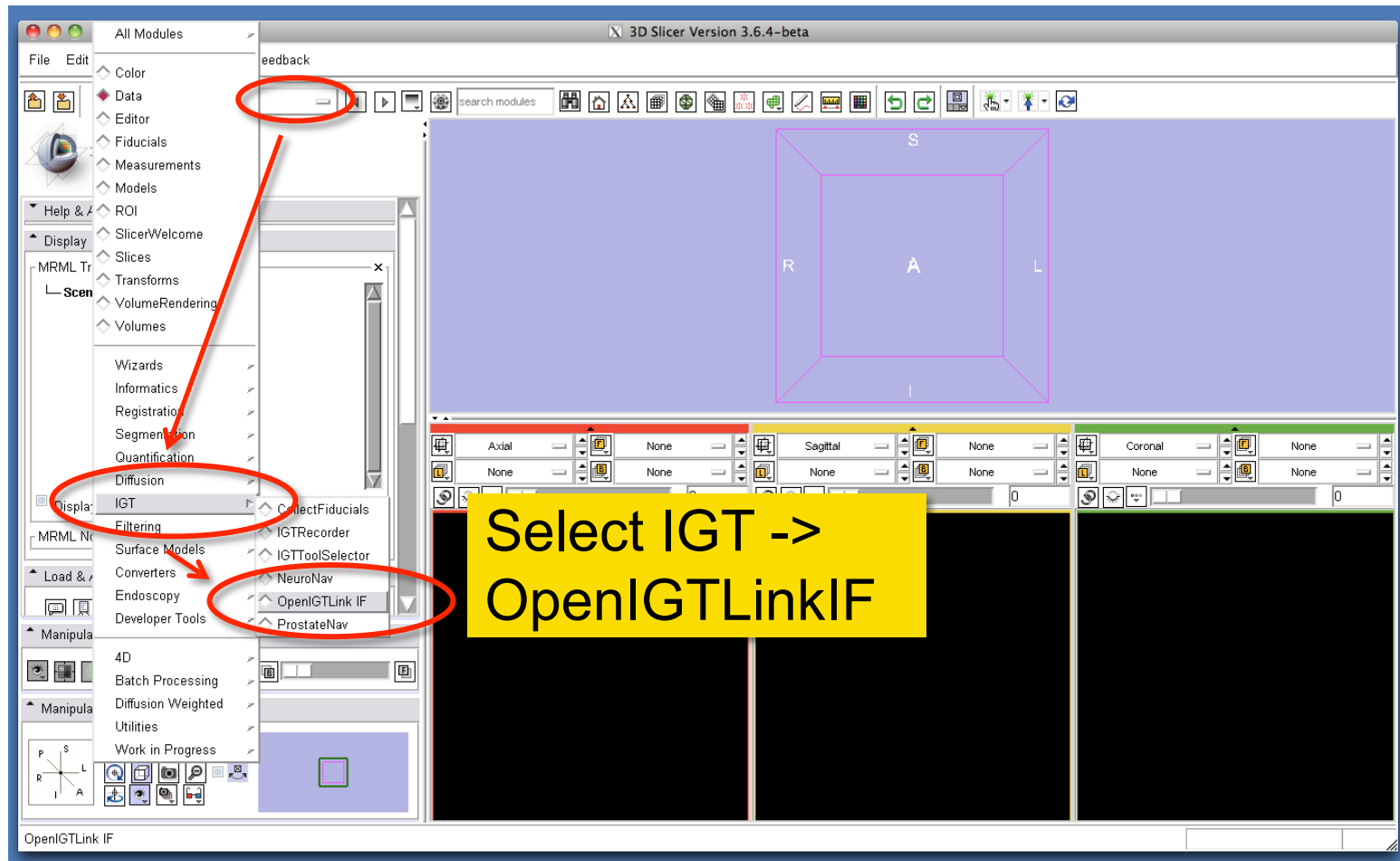
Adding Connector

To connect 3D Slicer to external device/software using OpenIGTLink IF, a "connector" has to be created for each connection.

Connectors can be configured in "Connectors" Tab in OpenIGTLink IF module.
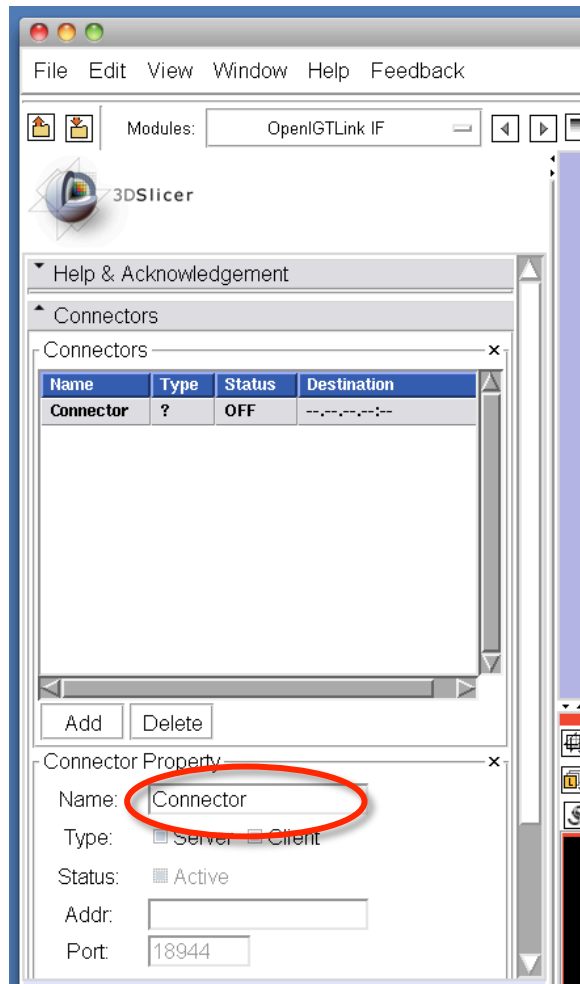
Adding Connector
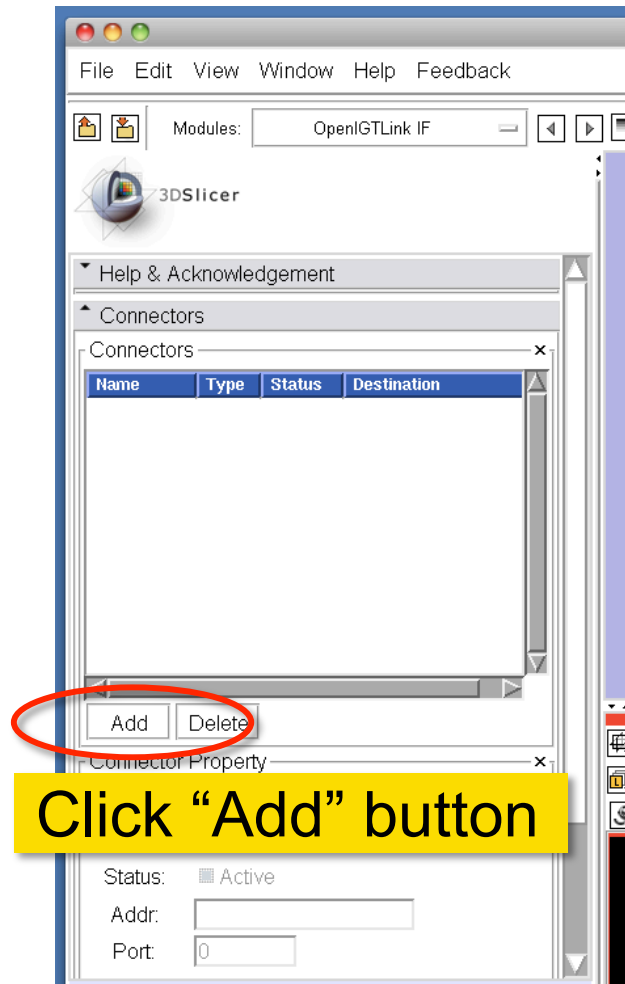
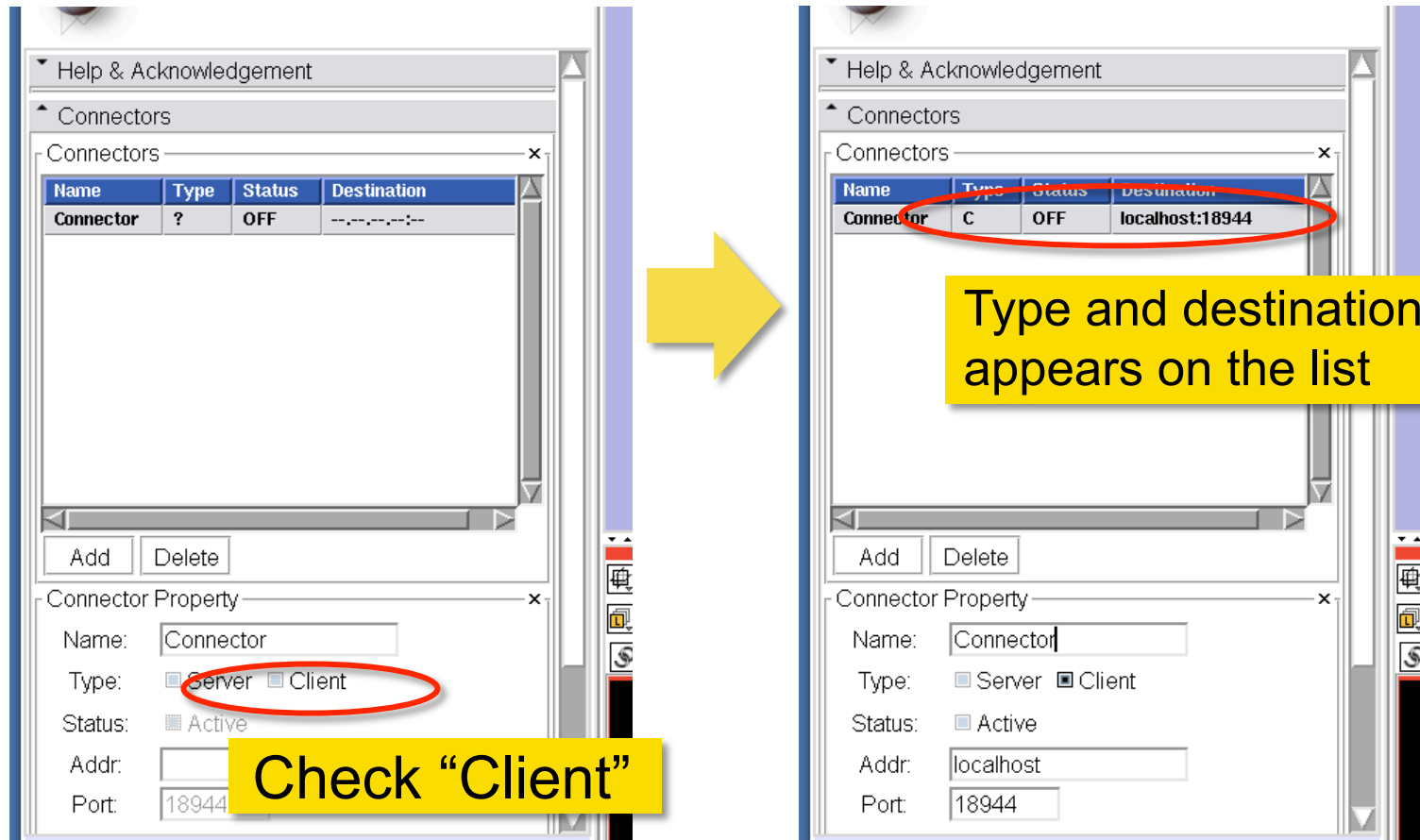"vtkMRMLIGTLConnectorNode1" shows up on the list

Click "Add" button
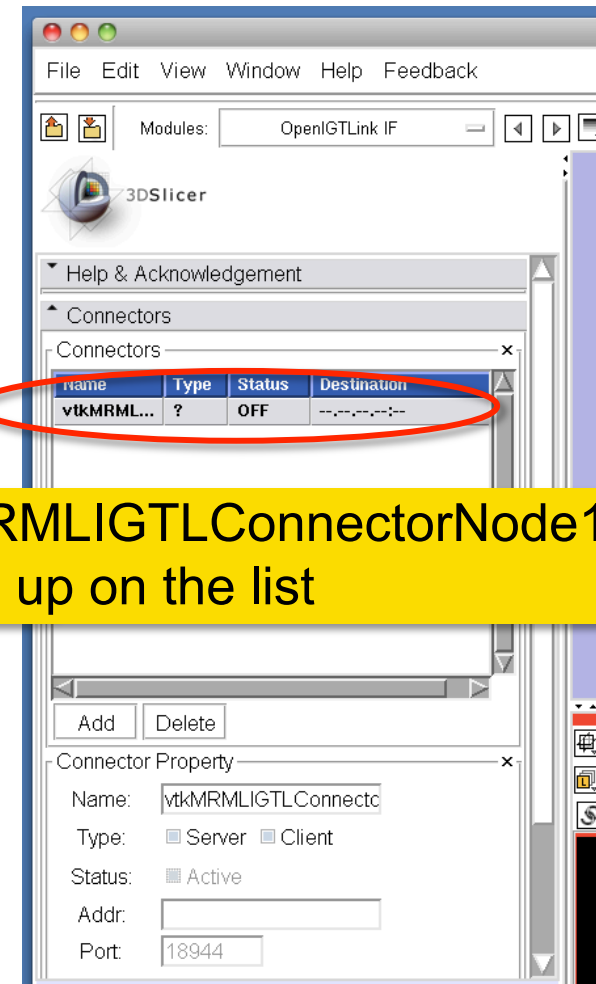
Changing Connector Name

You may change the name of the connector by type in a new name and hit Return key.

This is an optional step. It is a good idea to name connectors, especially if you have multiple connections.

Setting Connector Type

Type and destination appears on the list

Check "Client"
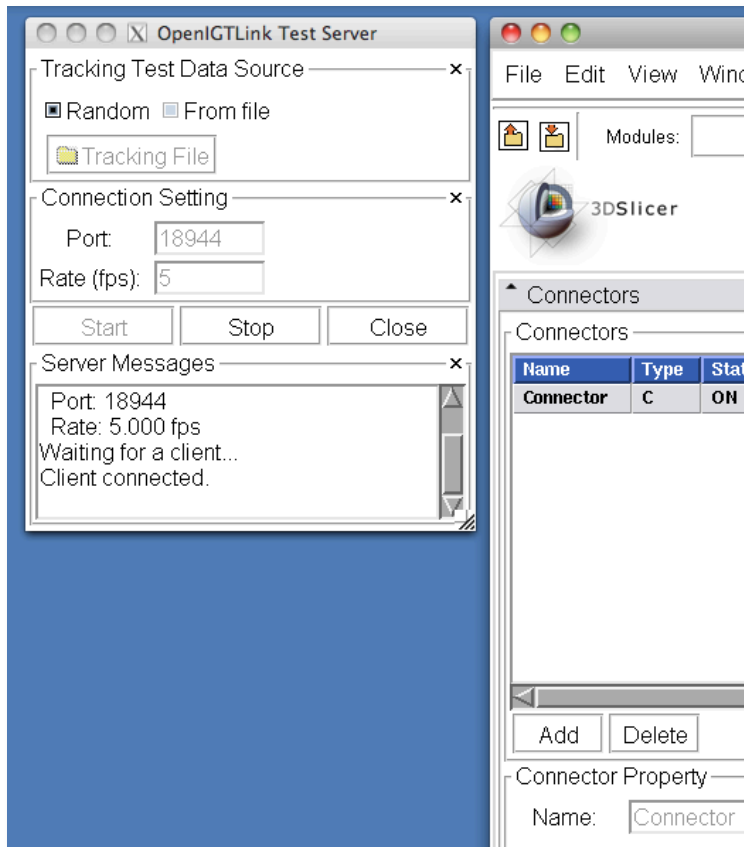
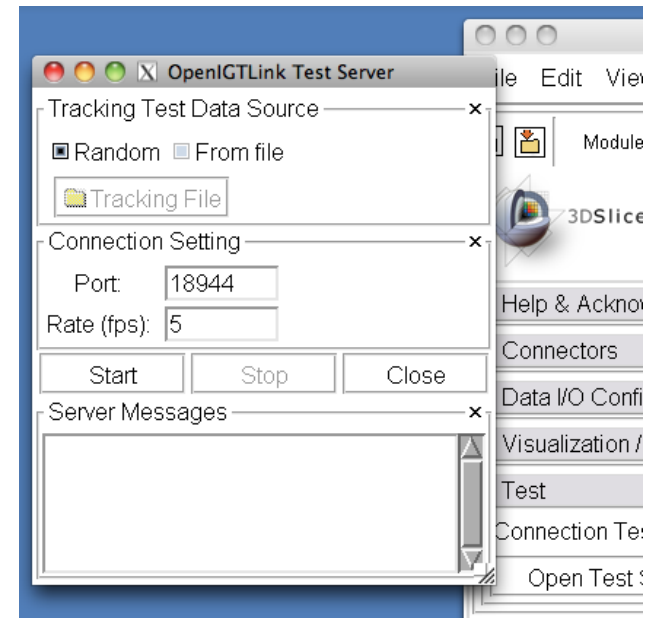# Part 2: Setting up Test Server

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Open Test Server
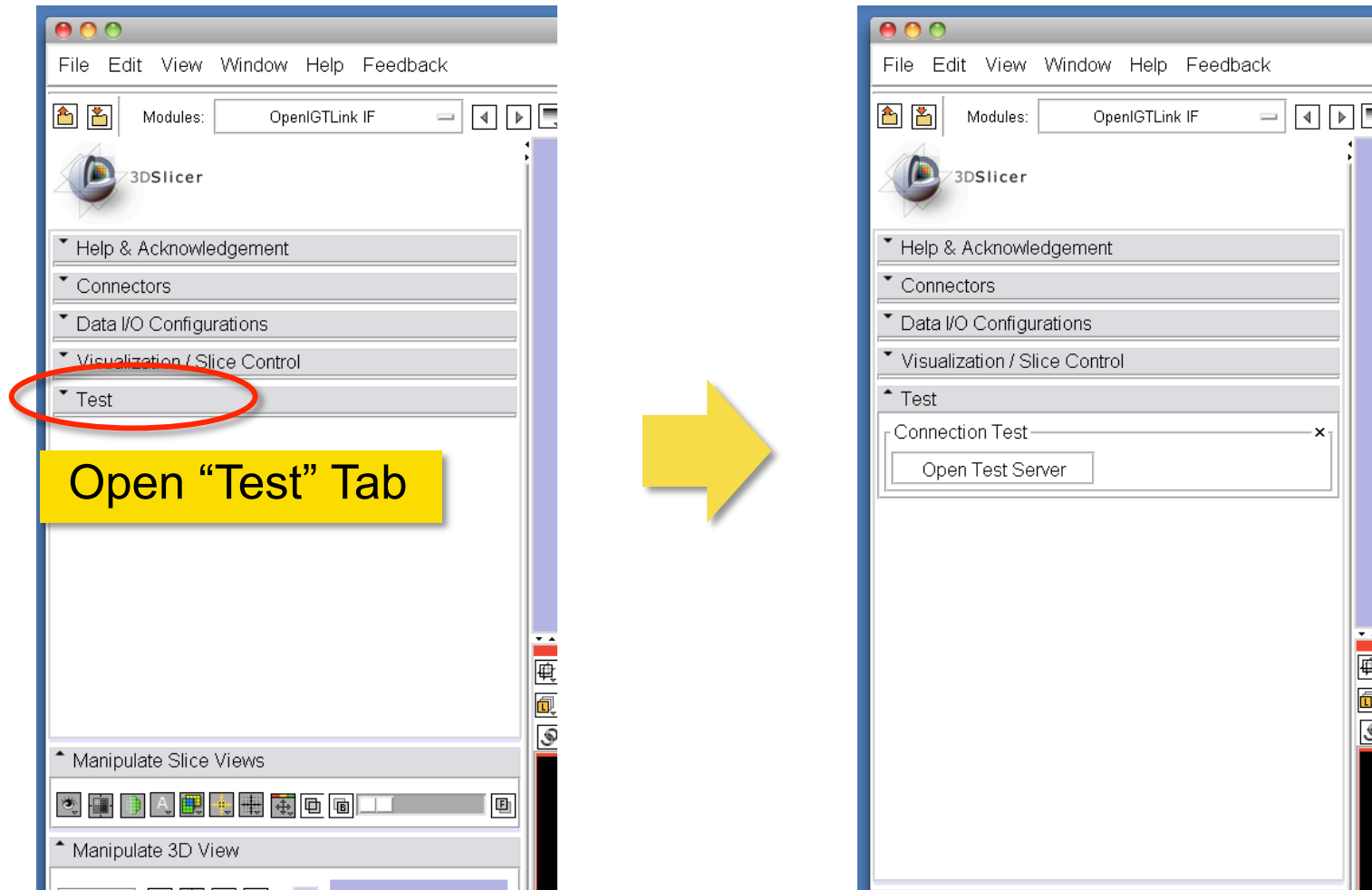
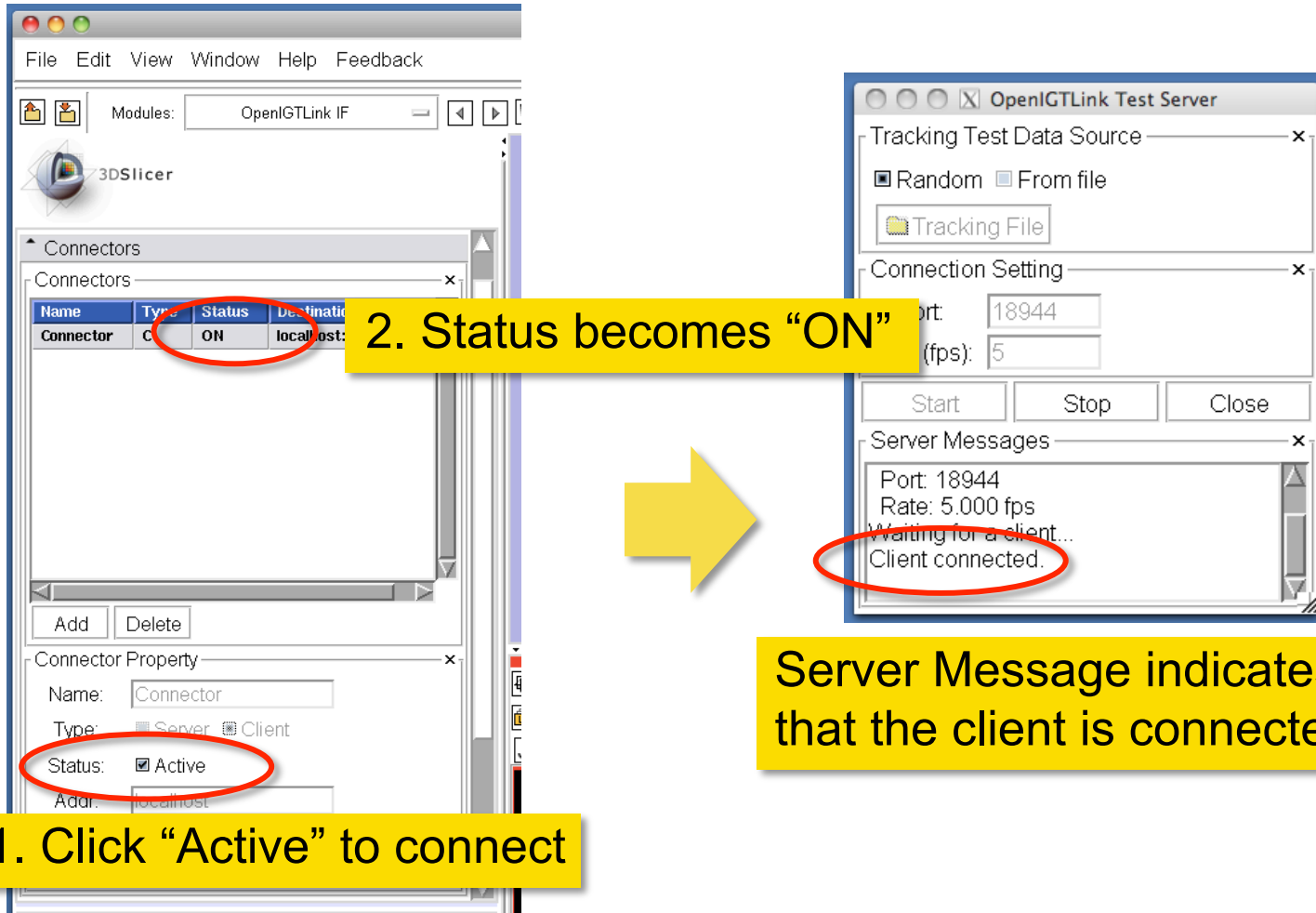Open "Test" Tab
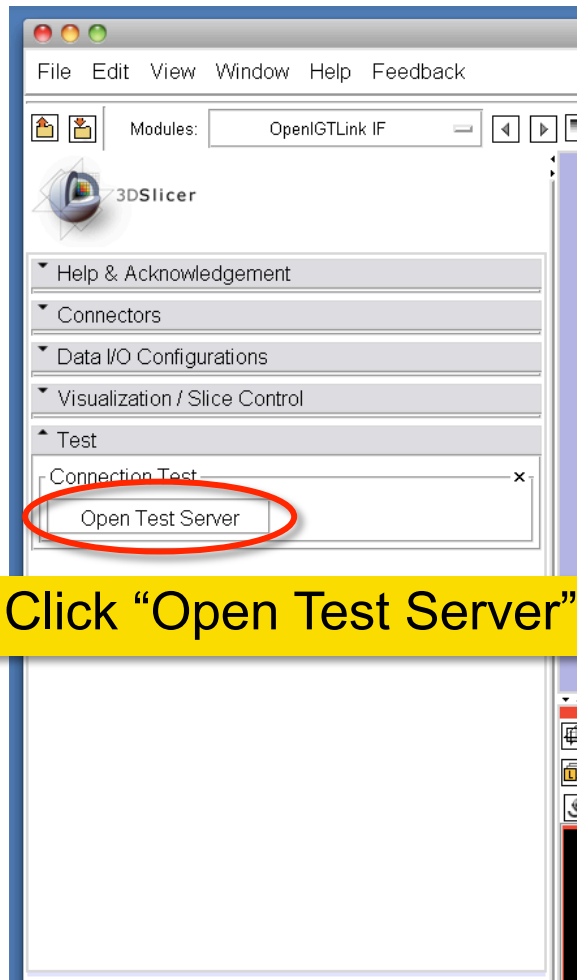
Open Test Server

Click "Open Test Server"

OpenIGTLink Test Server window pops up on the screen

Start Test Server

Click "Start" button
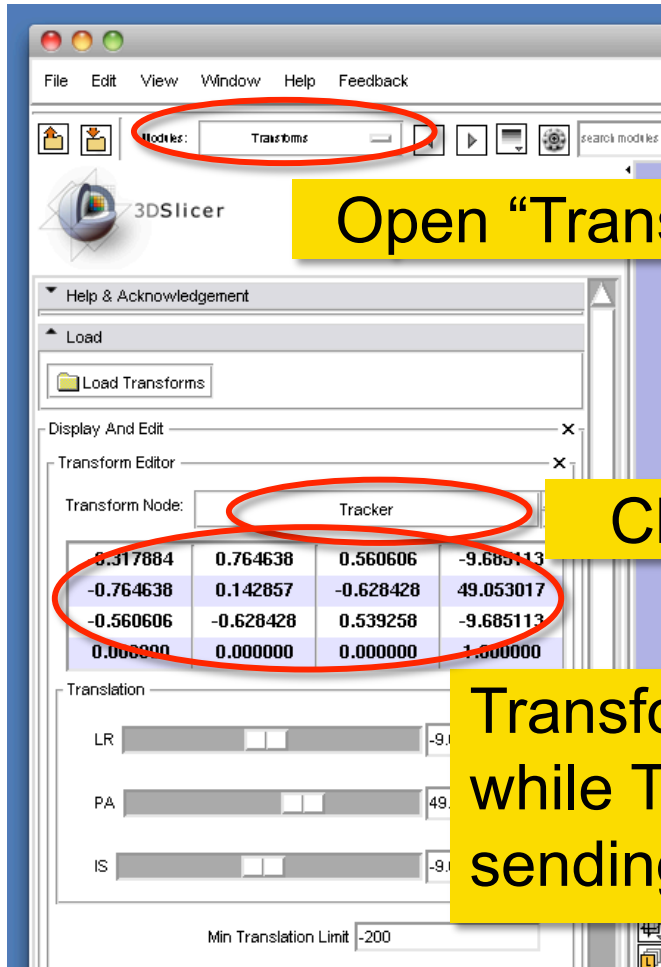
Server Message window shows "Waiting for a client…"

Connect to Test Server

2. Status becomes "ON"

Server Message indicates that the client is connected.

1. Click "Active" to connect

Checking Transform

Open "Transforms"

Choose "Tracker"

Transform is being updated while Tracker Simulator is sending data.
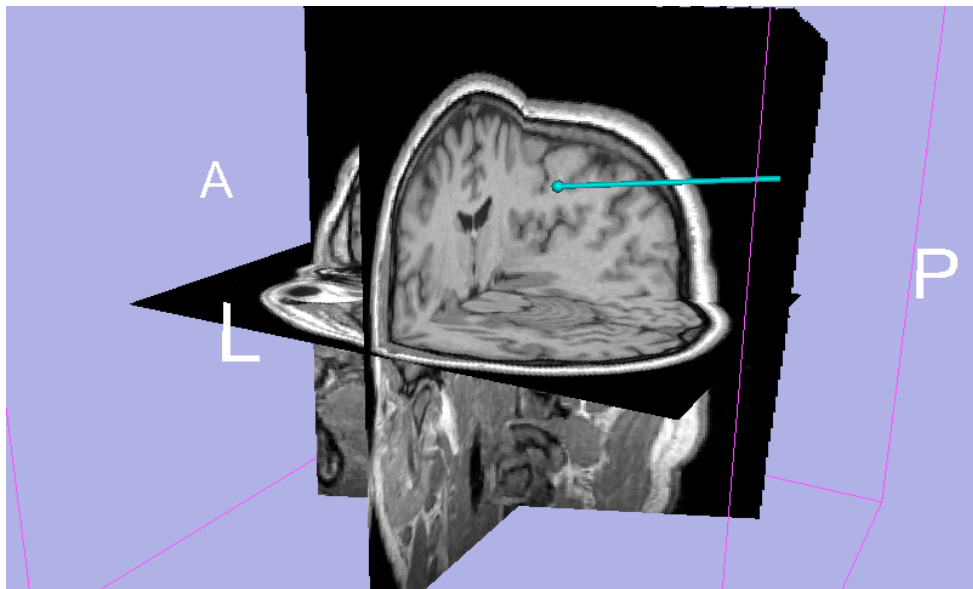
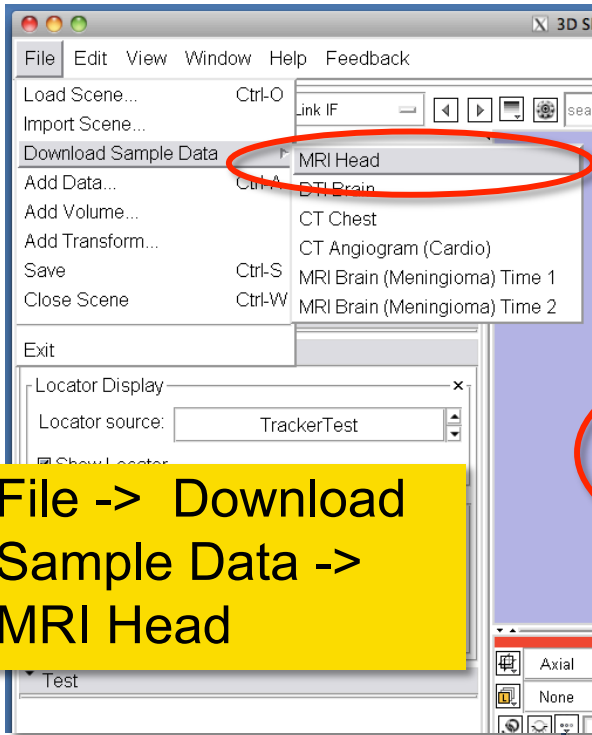# Part 3: Visualizing Tracking Data

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Loading Sample MRI Data

Data I/O Manager Window pops up and download starts
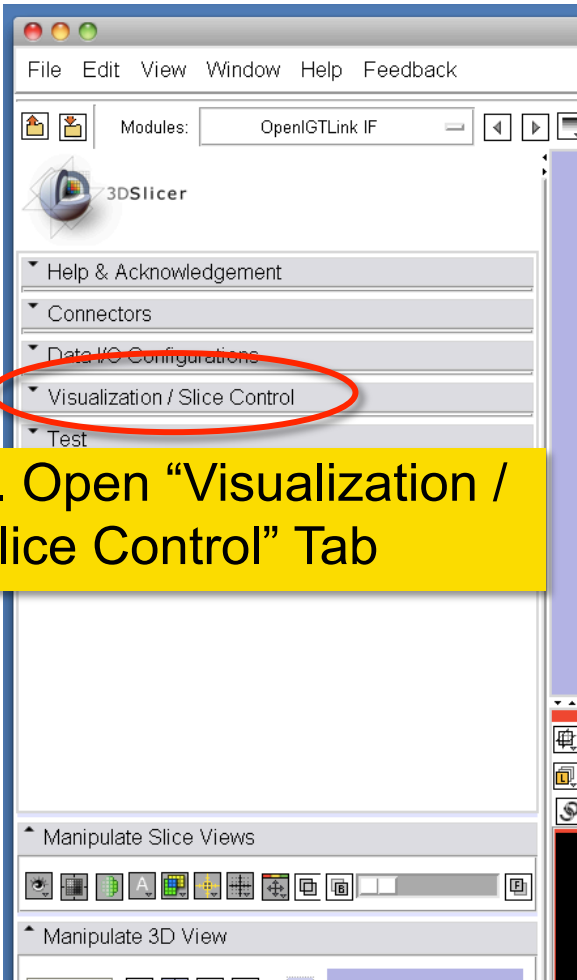
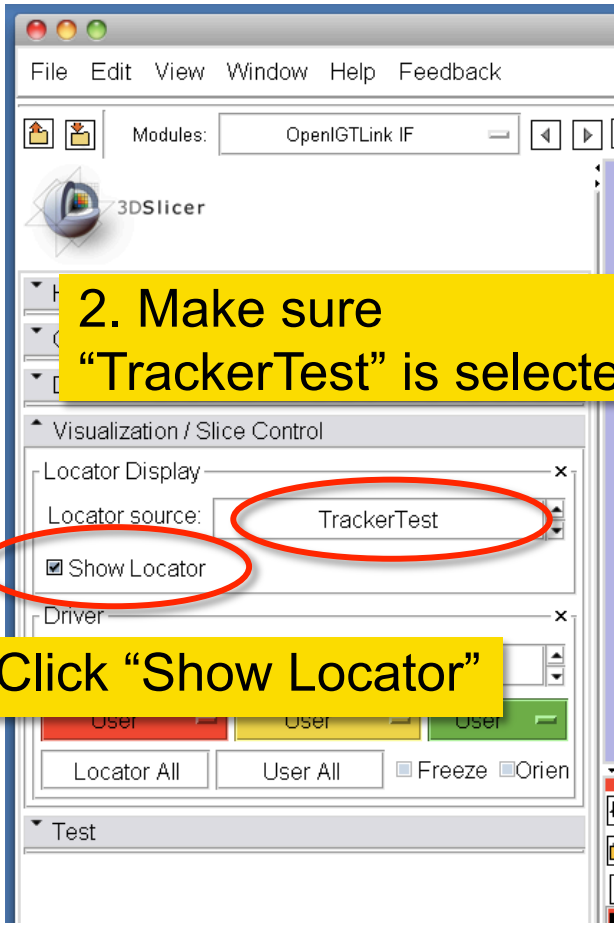File -> Download Sample Data -> MRI Head
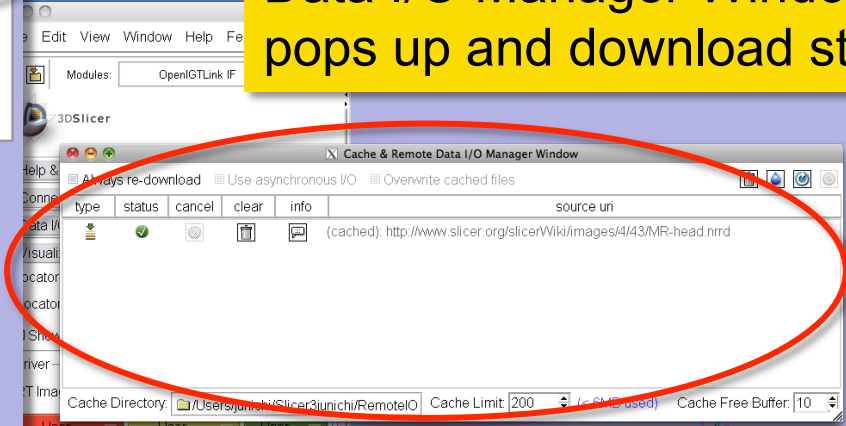
Sample MRI shows up

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Choosing Locator Source

1. Open "Visualization / Slice Control" Tab

2. Make sure "TrackerTest" is selected.
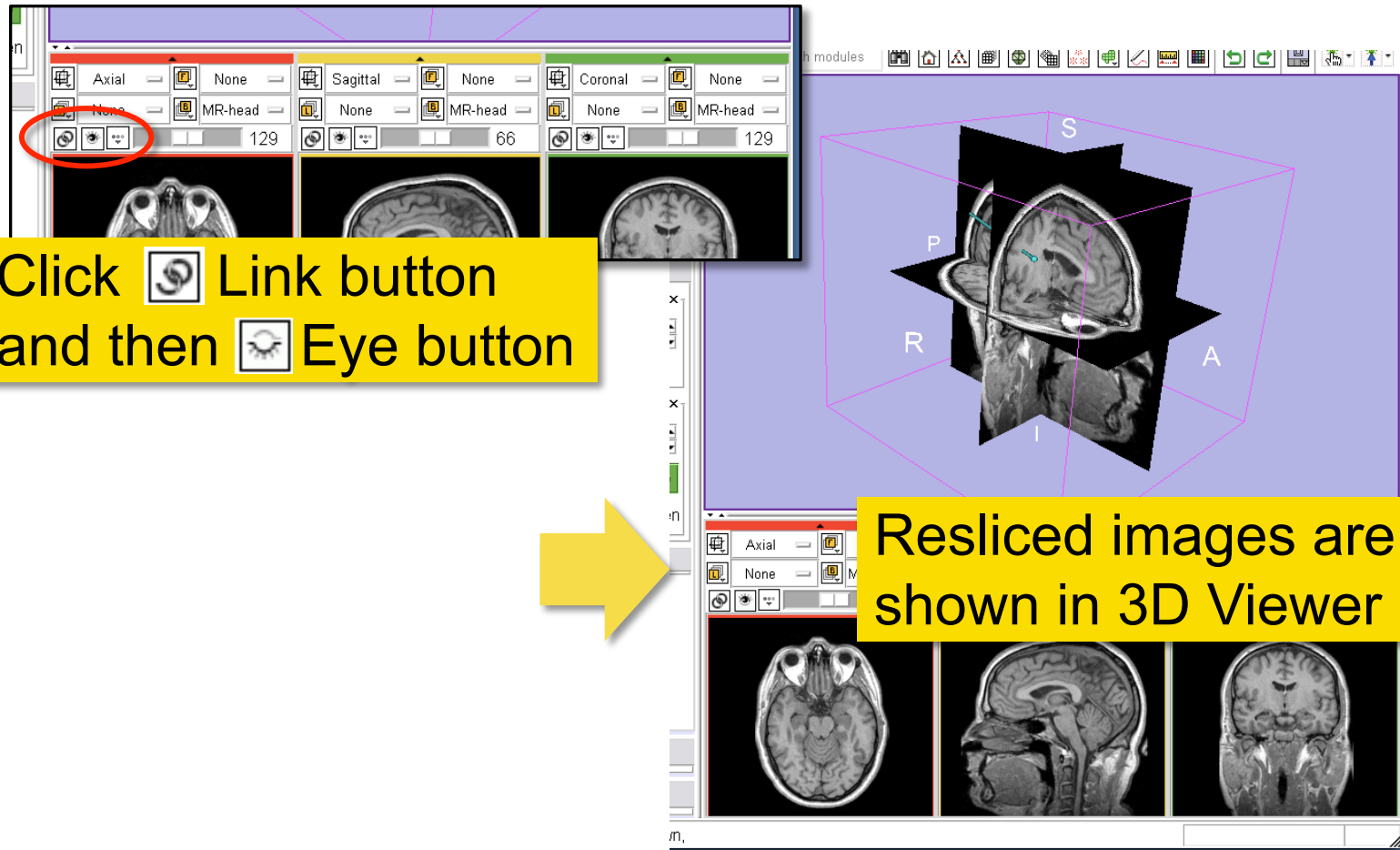
3. Click "Show Locator"

Visualizing Locator

Locator model appears in 3D Viewer
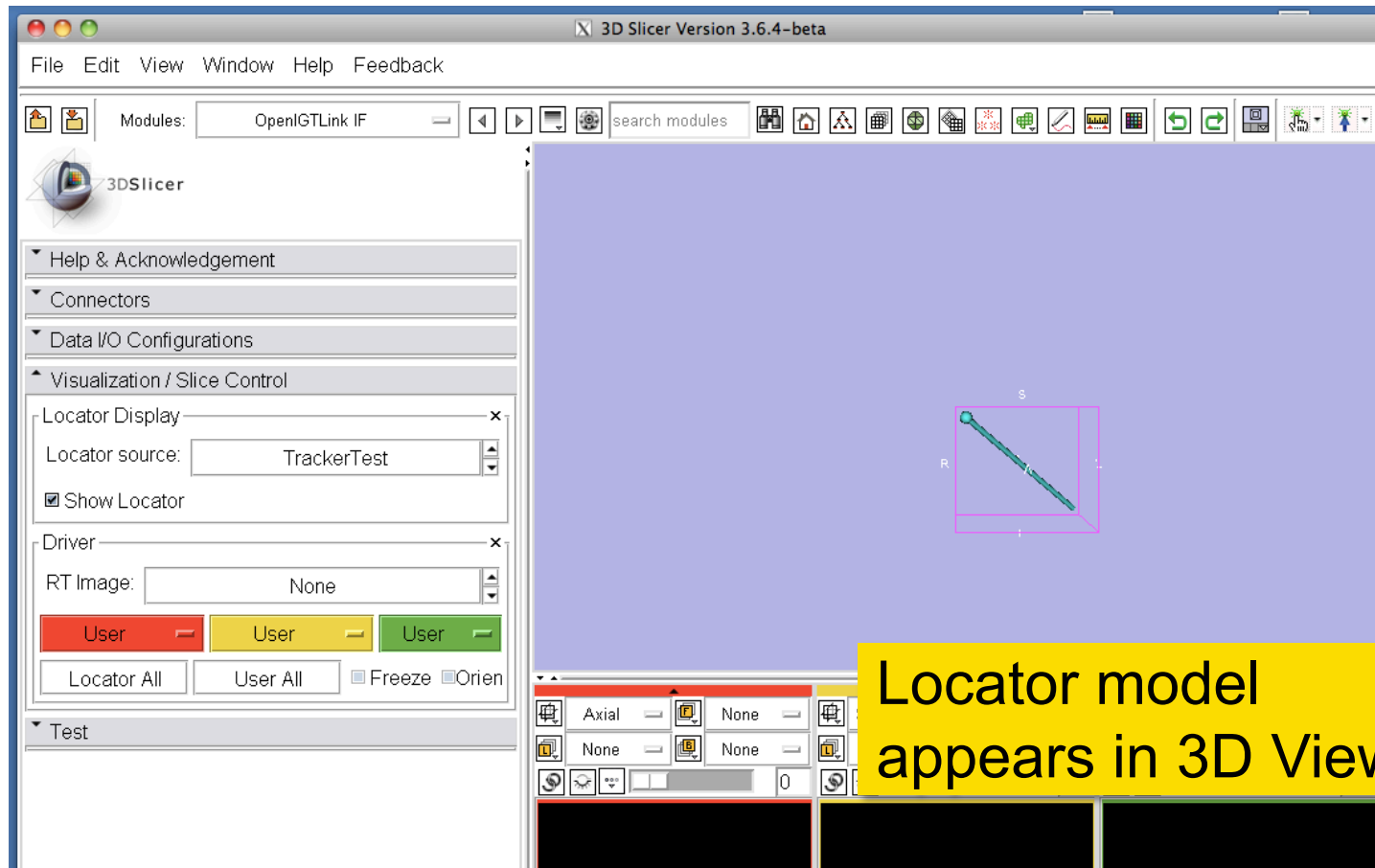
Showing Resliced Images

Click 🔗 Link button and then 👁 Eye button

Resliced images are shown in 3D Viewer

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Setting Slice Driver

1. Open "Visualization / Slice Control" Tab

Sample MRI data is resliced in axial, sagittal and coronal planes at the tip of the locator
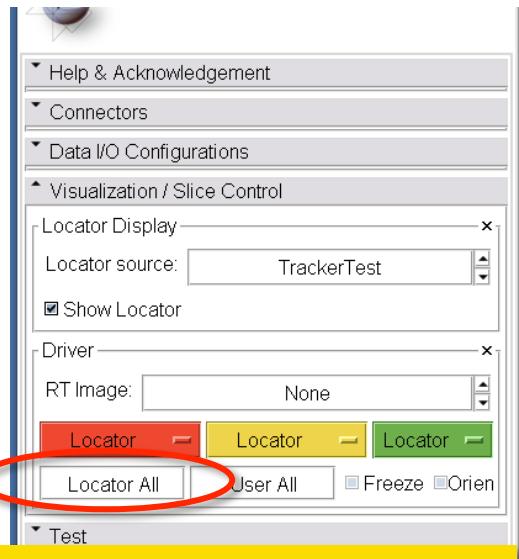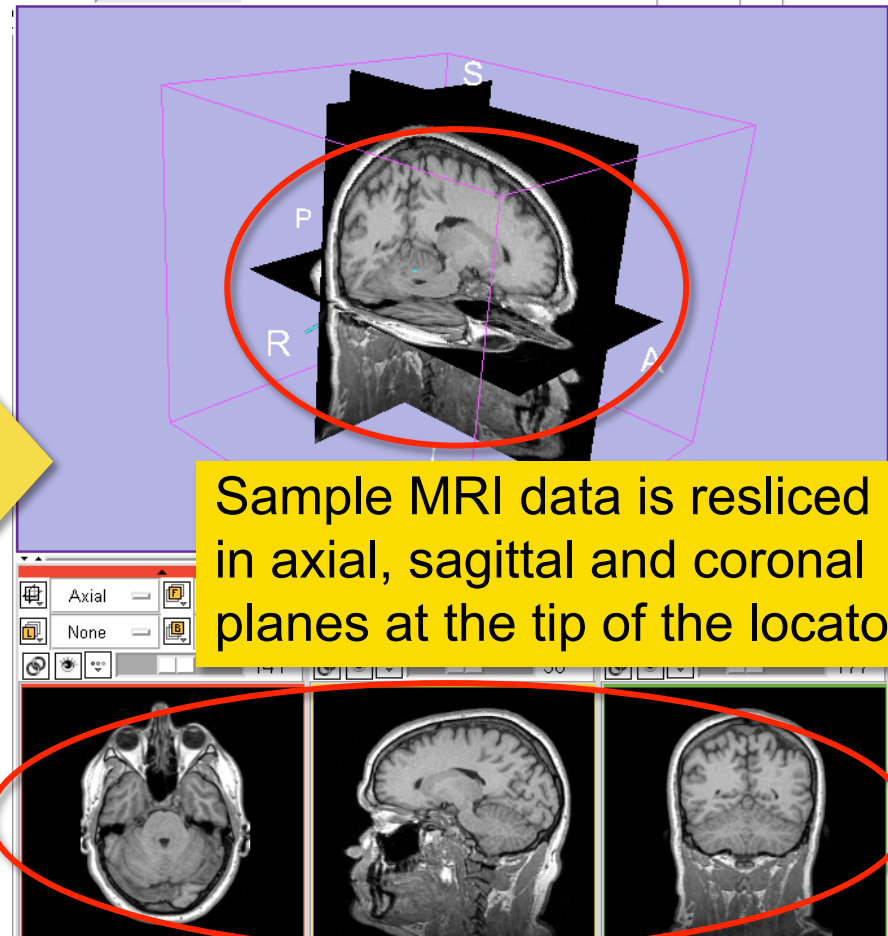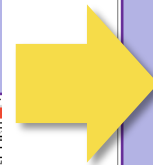
Setting Slice Orientation

Check "Orient"

Sample MRI data is resliced in parallel and perpendicular to the locator
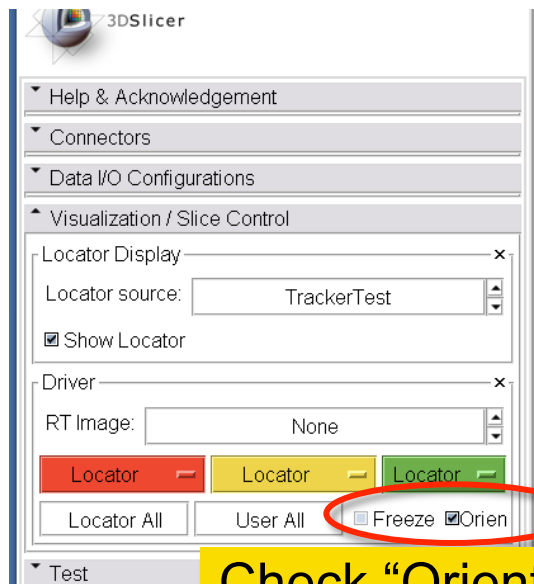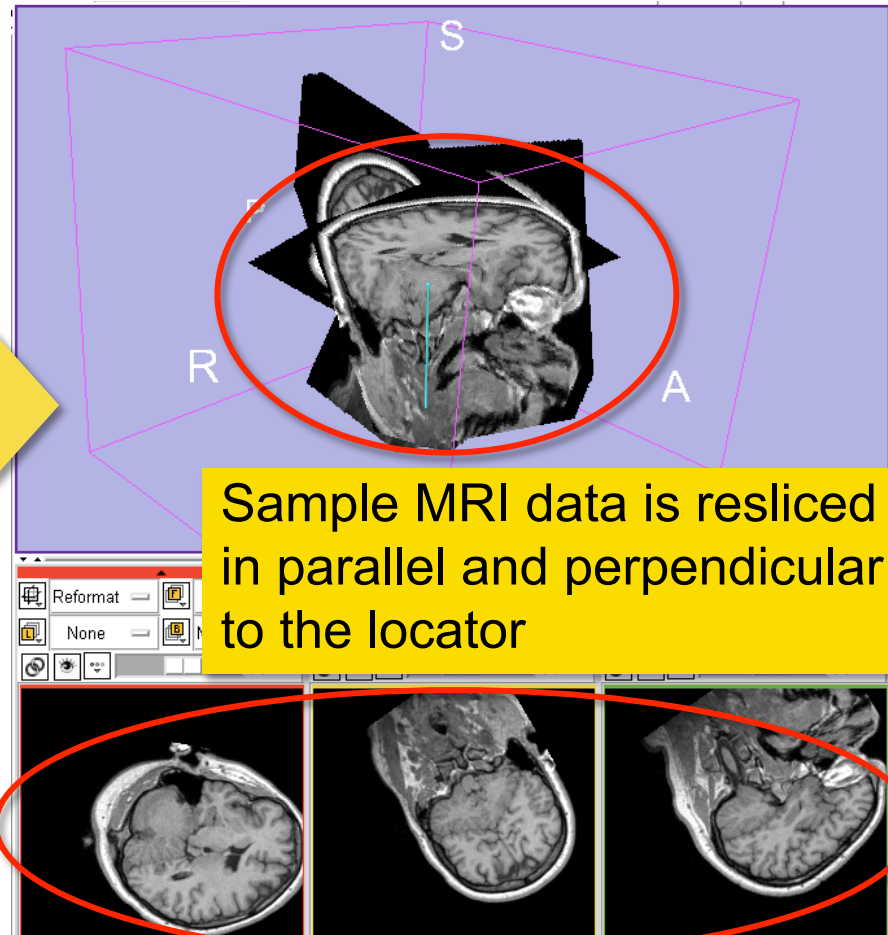
References

- 3D Slicer OpenIGTLinkIF Documentation Page

  http://www.slicer.org/slicerWiki/index.php/Modules:OpenIGTLinkIF-Documentation-3.6

- OpenIGTLink Protocol Web Page:

  http://www.na-mic.org/Wiki/index.php/OpenIGTLink

- Paper

  Tokuda J., *et al.* OpenIGTLink: an open network protocol for image-guided therapy environment. Int J Med Robot. 2009 Dec;5(4):423-34. PMID: 19621334. PMCID: PMC2811069.

Acknowledgments

National Center for Image Guided Therapy (NIH P41RR019703, P01CA067165), BRP Enabling Technologies for MRI–Guided Prostate Intervention (NIH R01CA111288)

National Alliance for Medical Image Computing (NIH U54EB005149)

Intelligent Surgical Instruments Project of METI (Japan)