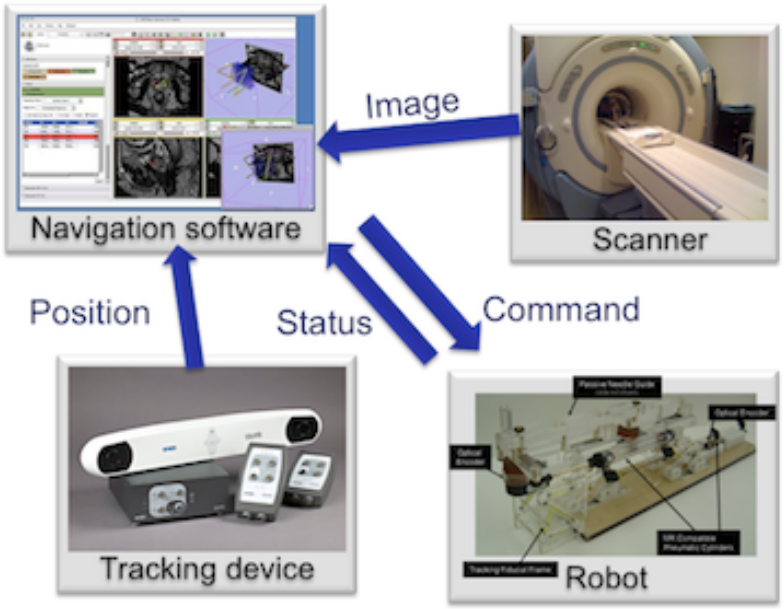
Connecting IGT Device with OpenIGTLink



Junichi Tokuda, PhD

Material

This course requires the following installation:

- 3DSlicer version 3.6 Software (Slicer3.3.6-2010-12-03), which can be installed from:

  http://www.slicer.org/pages/Special:SlicerDownloads

- Tracker Simulator (archived in .zip file for each platform)

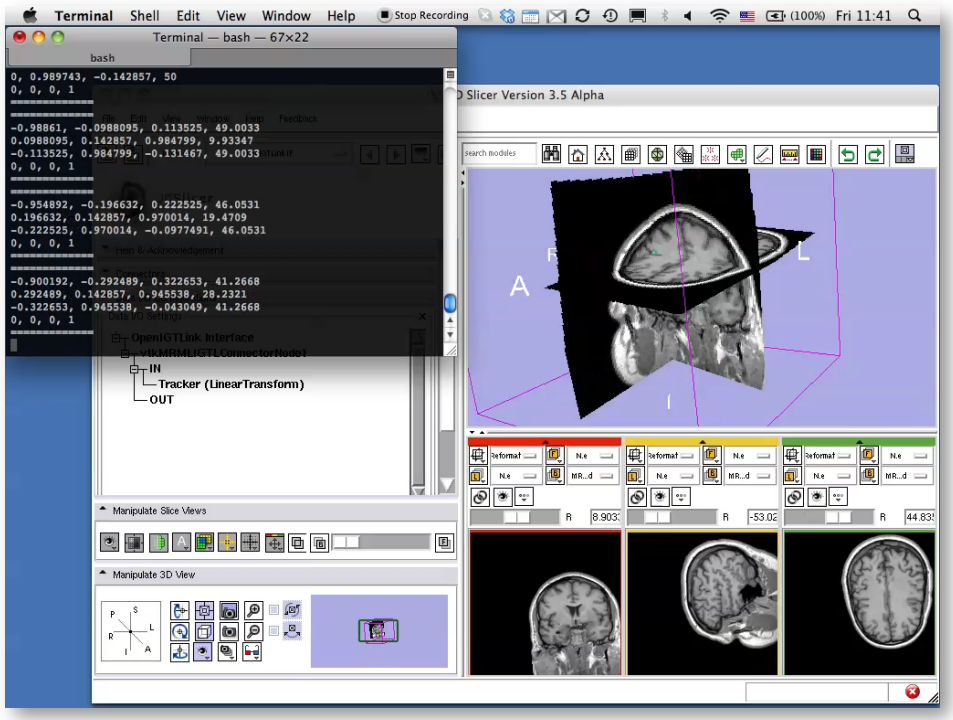
  http://www.slicer.org/slicerWiki/index.php/Modules:OpenIGTLinkIF-3.6-Simulators

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

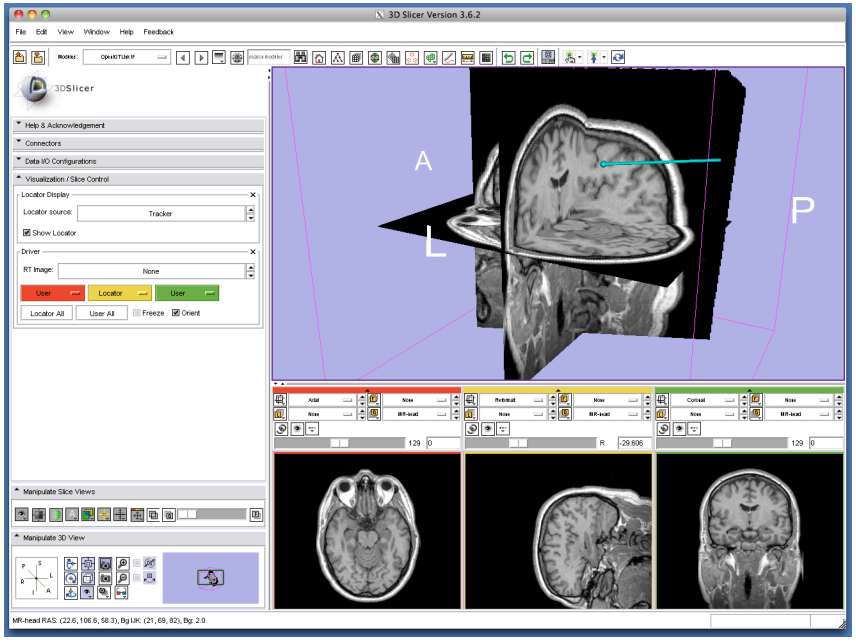
Following this tutorial, you'll be able to import tracking data from external devices (e.g. tracking system) through the network.



3DSlicer

Overview

- Configuring OpenIGTLink IF module
- Setting up Tracker Simulator
- Visualizing Tracking Data

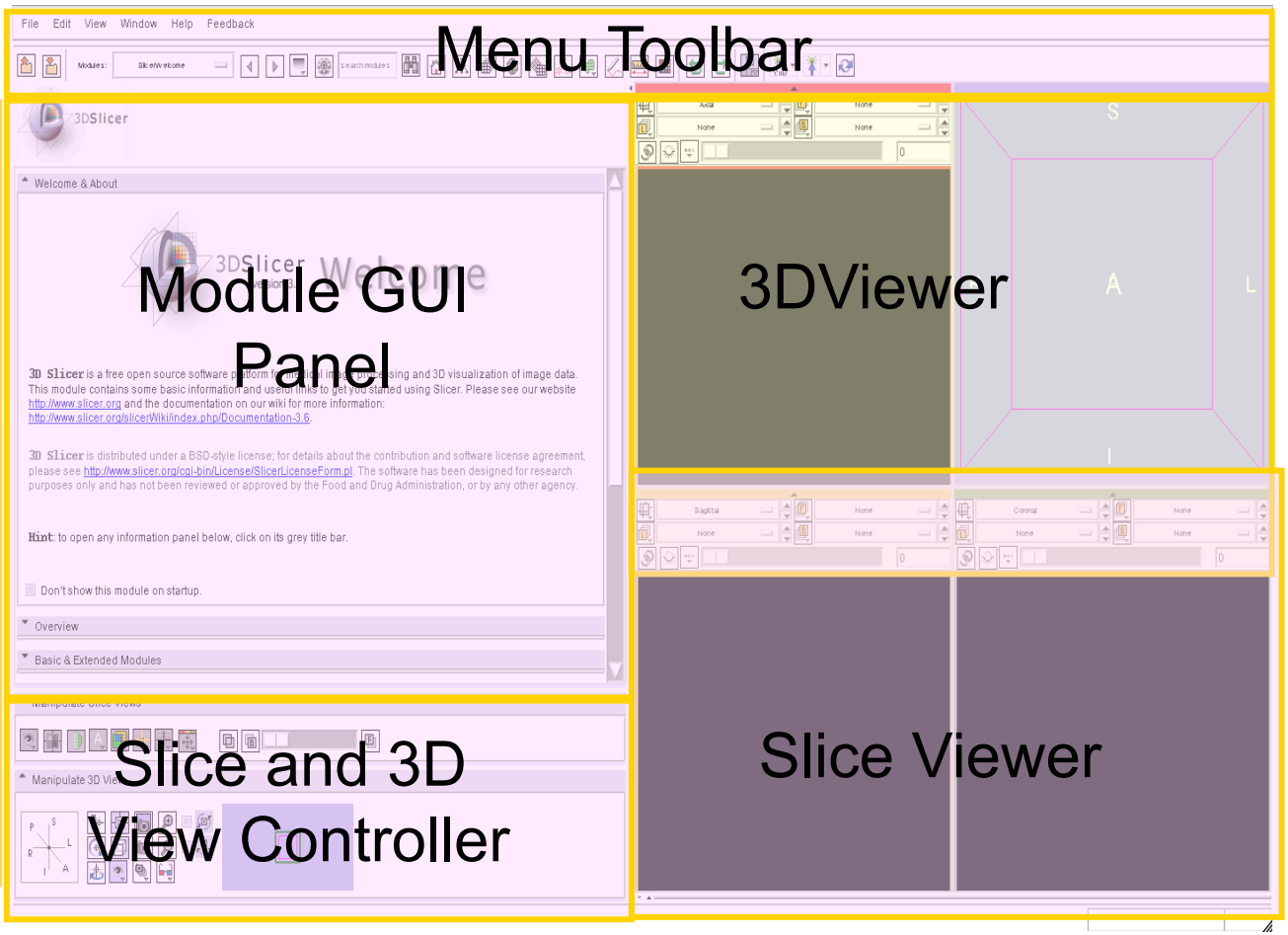


Part 1: Configuring OpenIGTLinkIF module

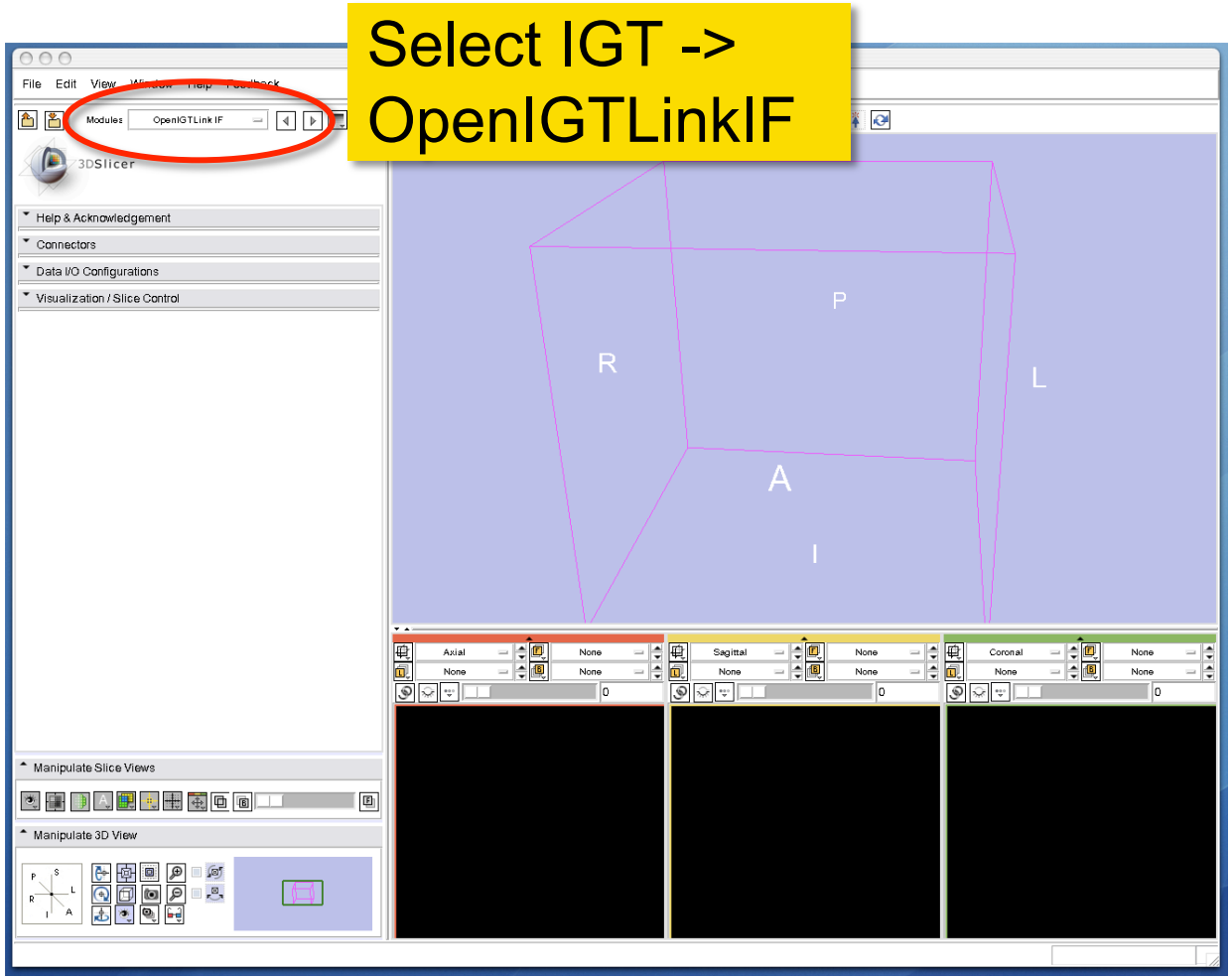
Slicer3 GUI

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

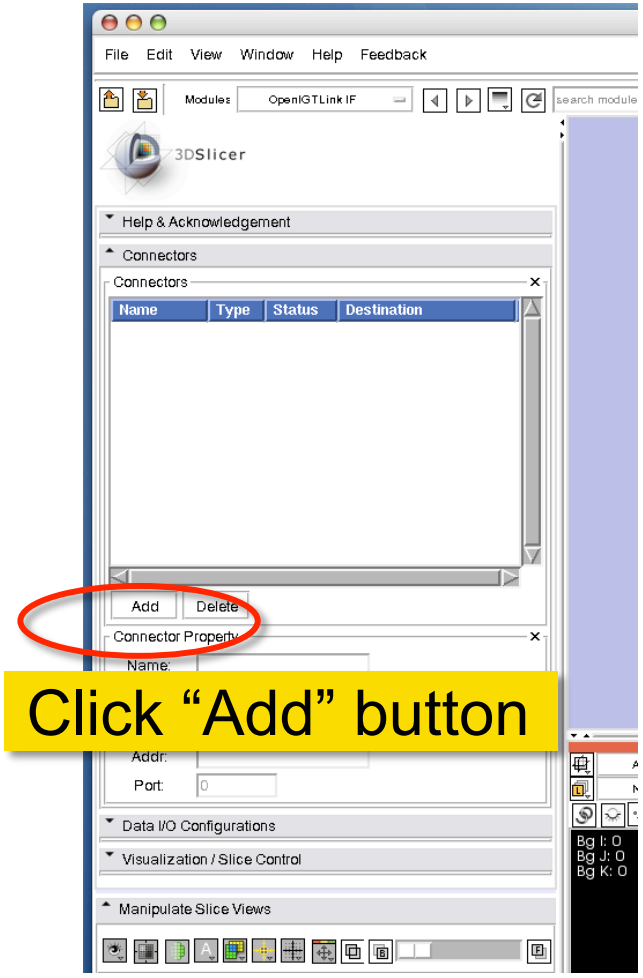
- the Menu Toolbar
- the Module GUI Panel
- the 3D Viewer
- the Slice Viewer
- the Slice and 3D View Controller



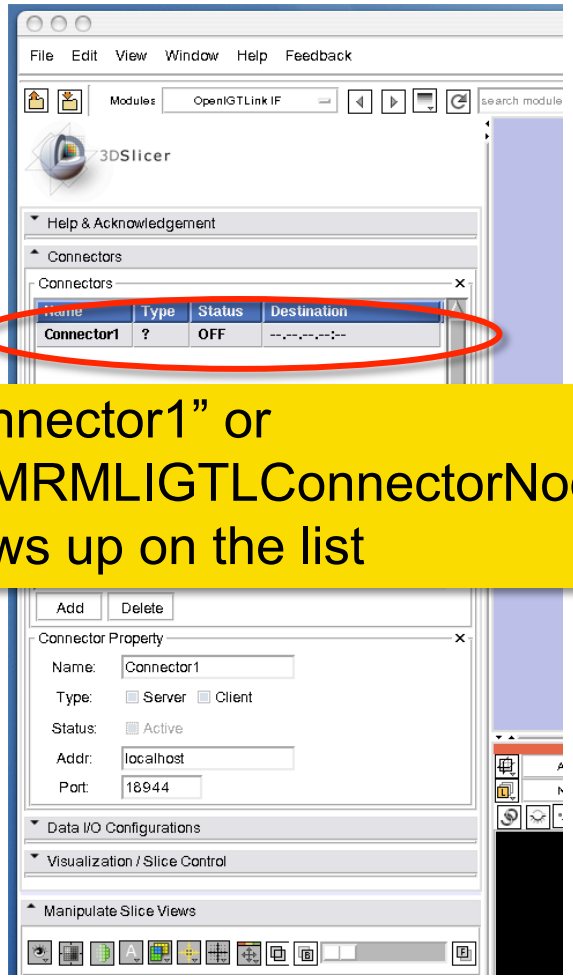
Starting OpenIGTLinkIF



Adding Connector

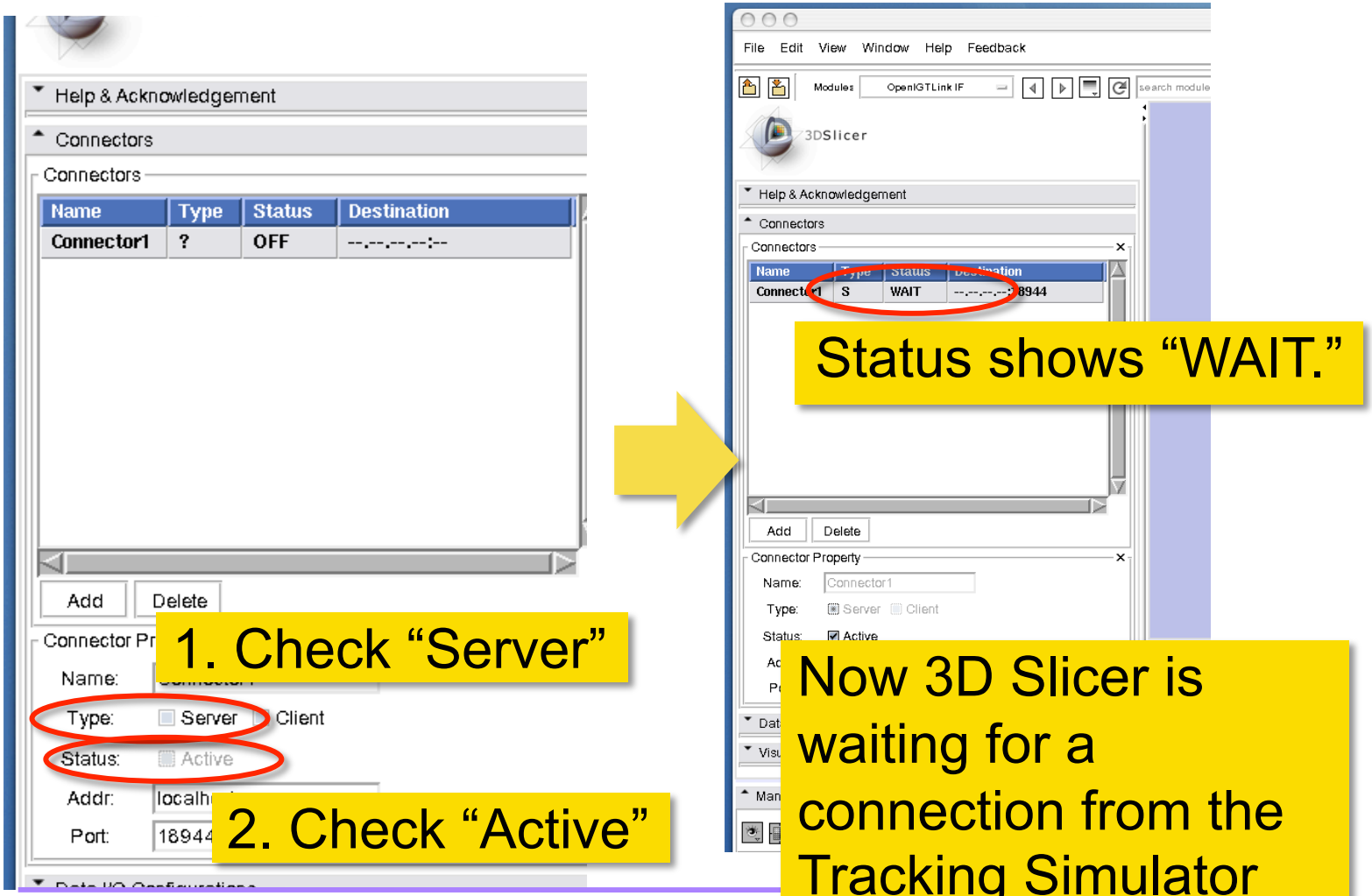


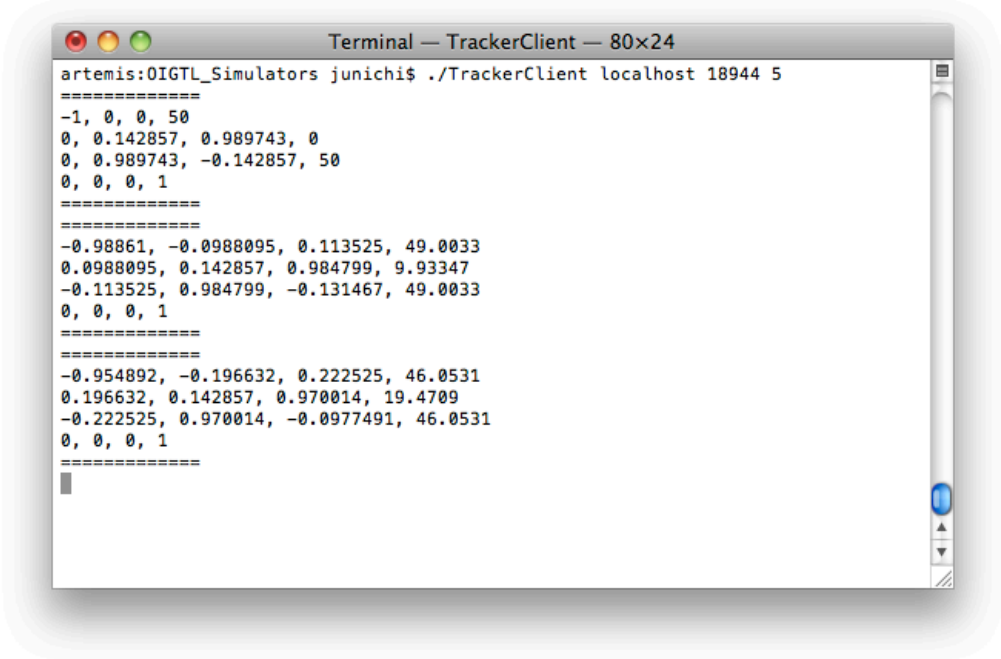
Click “Add” button



“Connector1” or “vtkMRMLIGTLConnectorNode1” shows up on the list

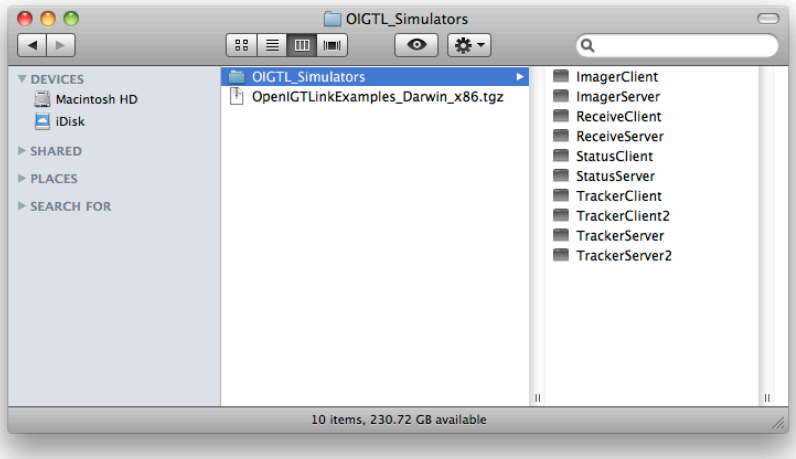
Setting Connector Type





Part 2: Setting up Tracker Simulator

Extracting Simulator Files



In the .zip archive of Tracking Simulator contains the following command line programs:

ImagerClient

ImagerServer

ReceiverClient

StatusClient

StatusServer

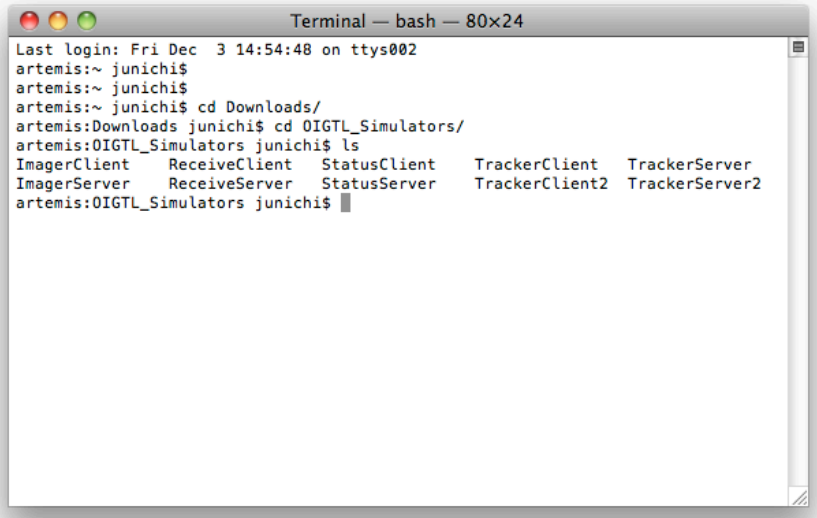
TrackerClient (used in this Tutorial)

TrackerClient2

TracerServer

TrackerServer2

Starting Tracking Simulator



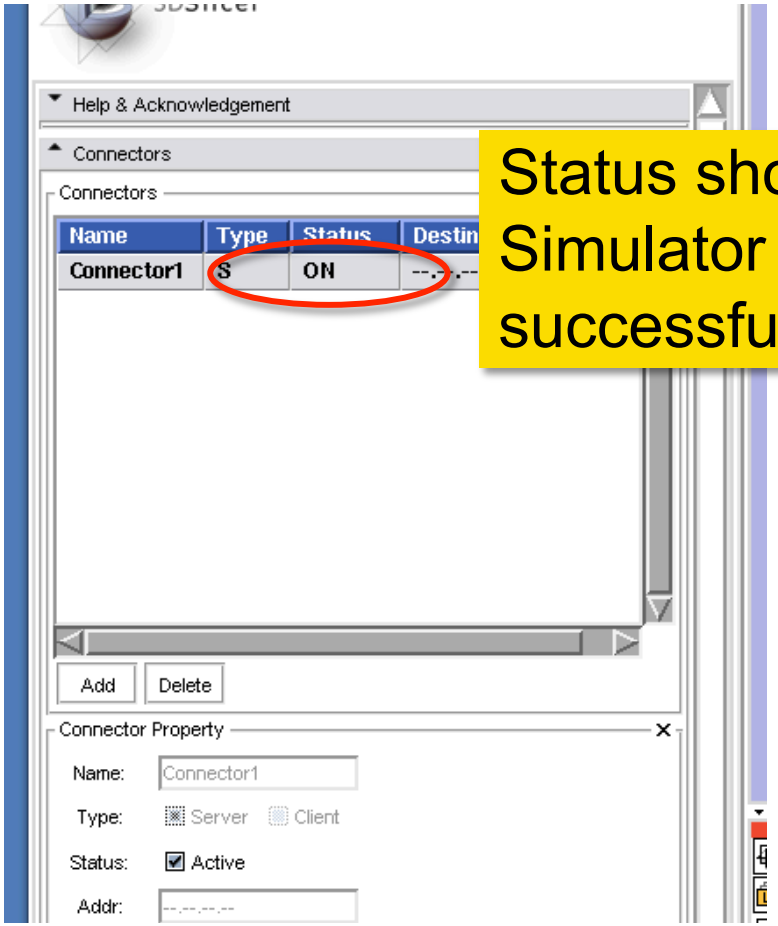
1. Unizp the downloaded file in the working directory.
2. From a terminal (or command prompt in Windows), go to the working directory and type in the following commands to start the simulator. (Please replace <directory> with the path to your actual working directory.

```
cd <directory>/OIGTL_Simulators

./TrackerClient localhost 18944 5
```

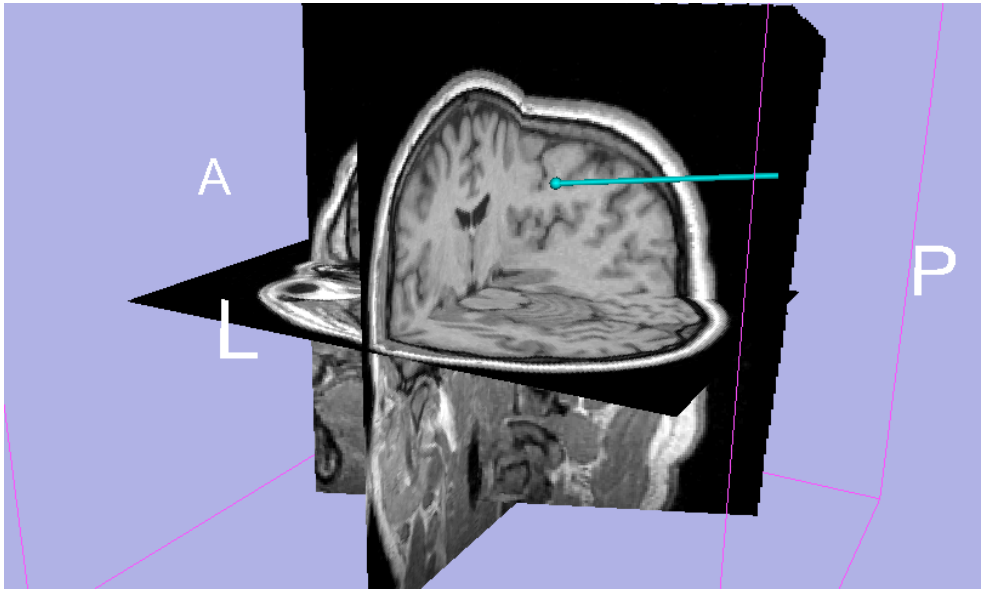
The Tracking Simulator will connect to 3D Slicer at port 18944 and send tracking data with frame rate of 5 fps.

Checking Connection



Status shows “ON,” if Tracker Simulator is connected successfully.

NOTE: Tracker Simulator stops after sending 100 transforms to 3D Slicer. If Status becomes “WAIT,” repeat the steps in Part 2.



Part 3: Visualizing Tracking Data

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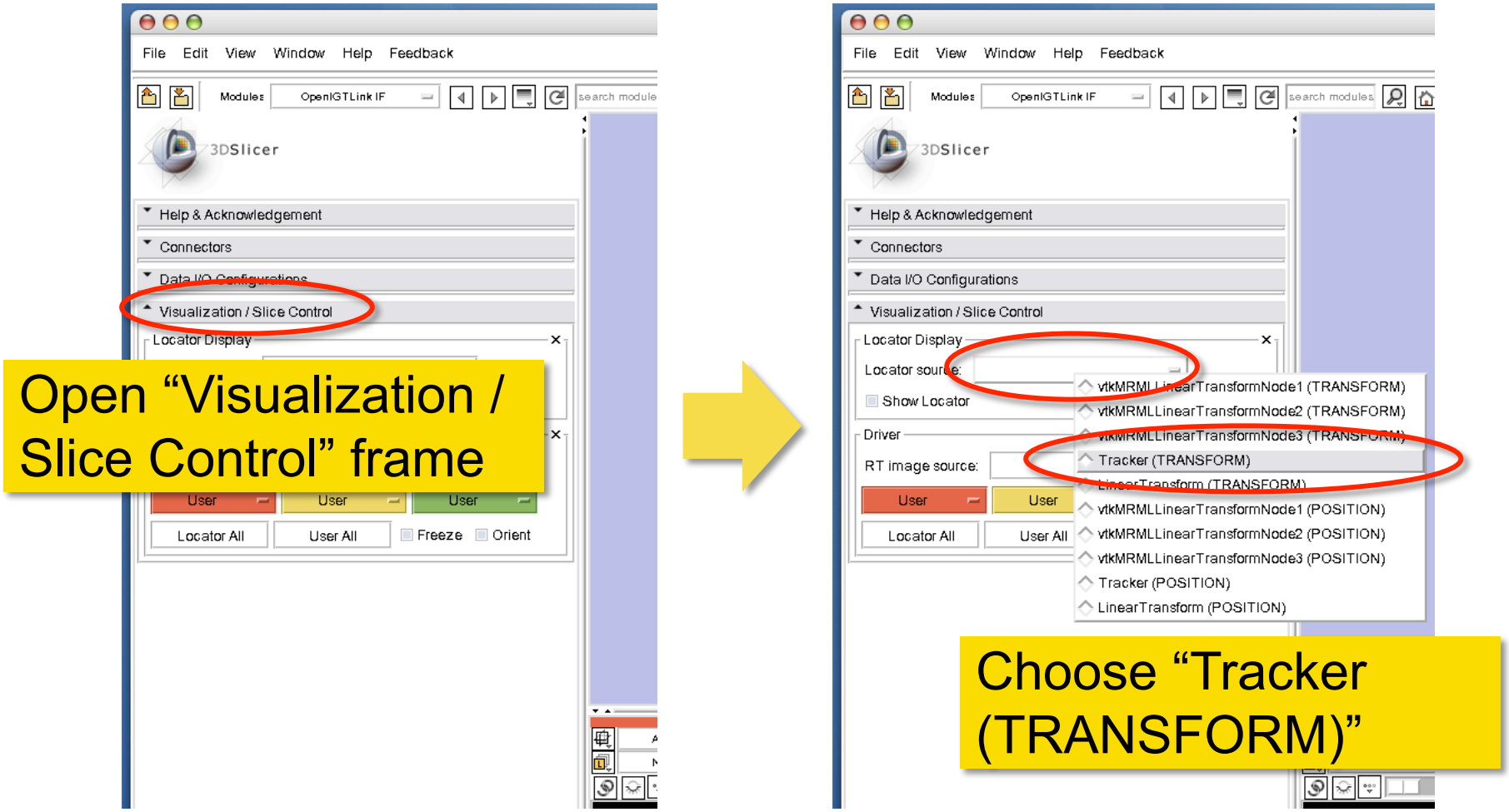
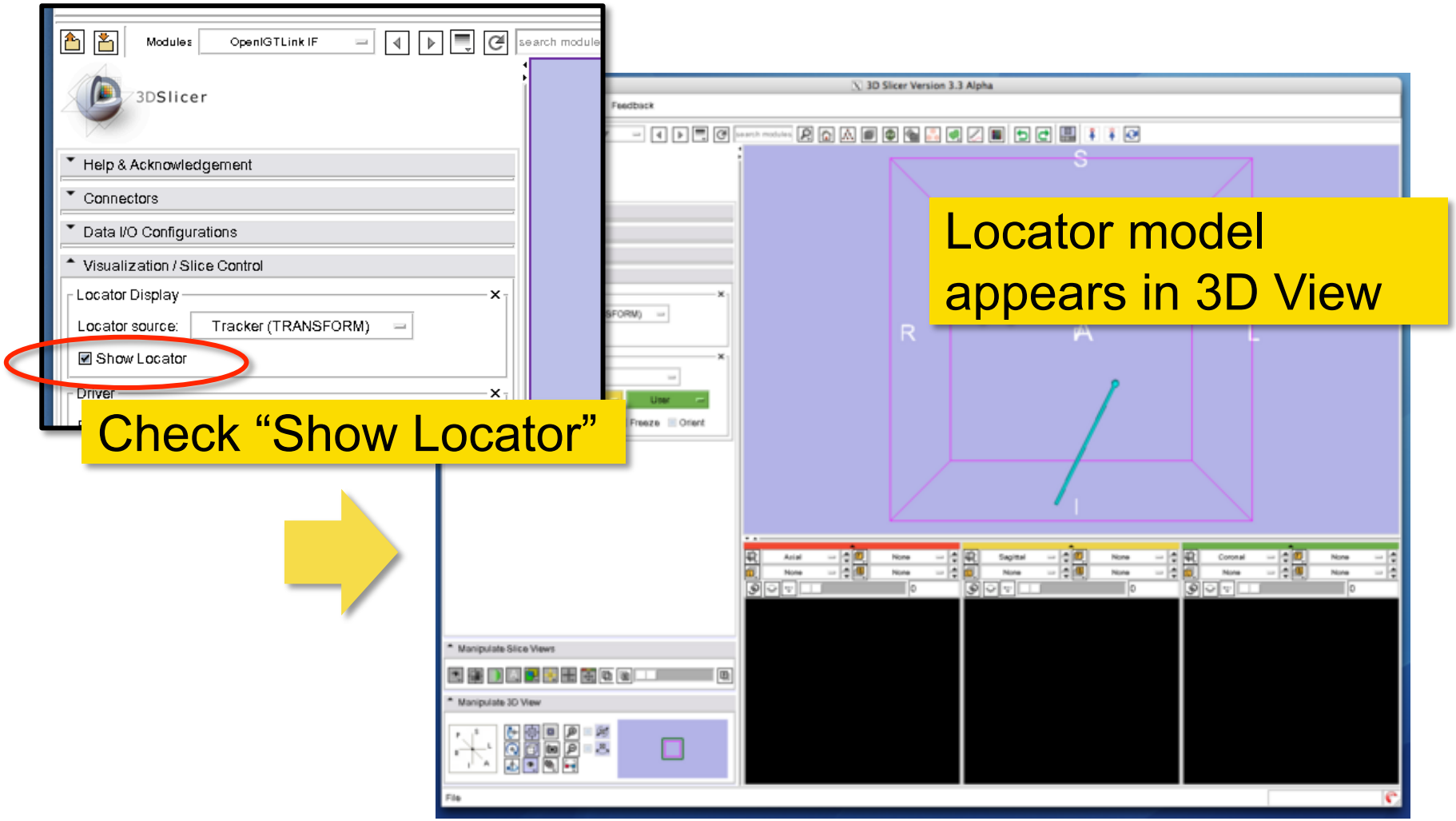
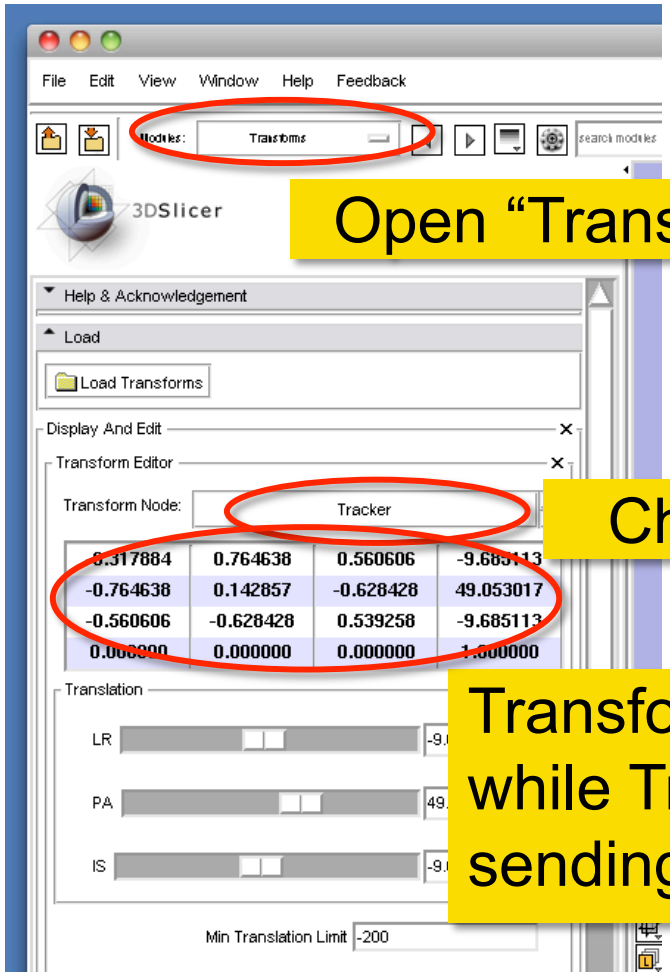
Choosing Locator Source



Choosing Locator Source



Checking Transform



Open “Transforms”

Choose “Tracker”

Transform is being updated while Tracker Simulator is sending data.

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

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National Alliance for Medical Image Computing (NIH U54EB005149)

Intelligent Surgical Instruments Project of METI (Japan)