

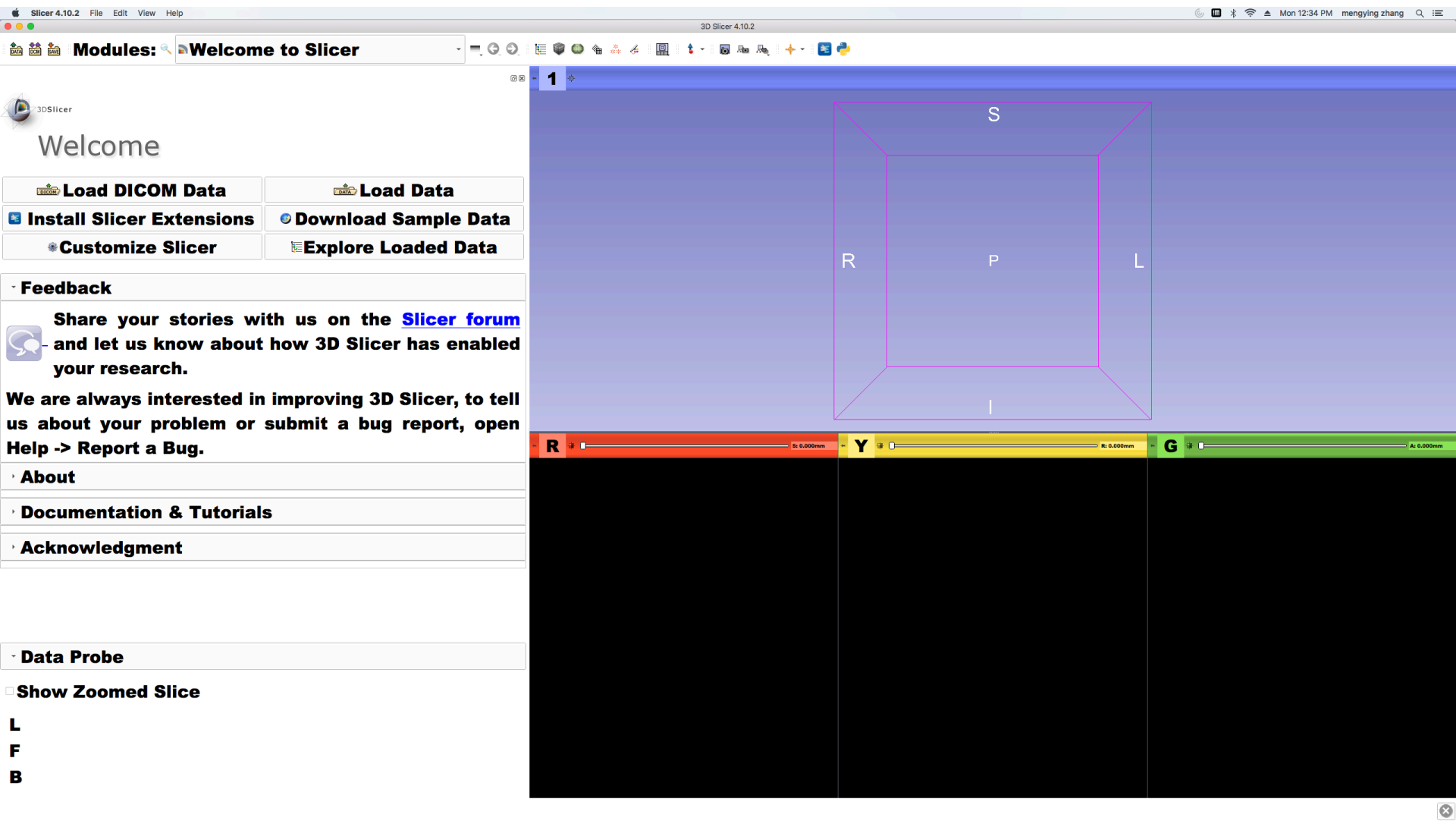
DWI Converter Tutorial

Fan Zhang

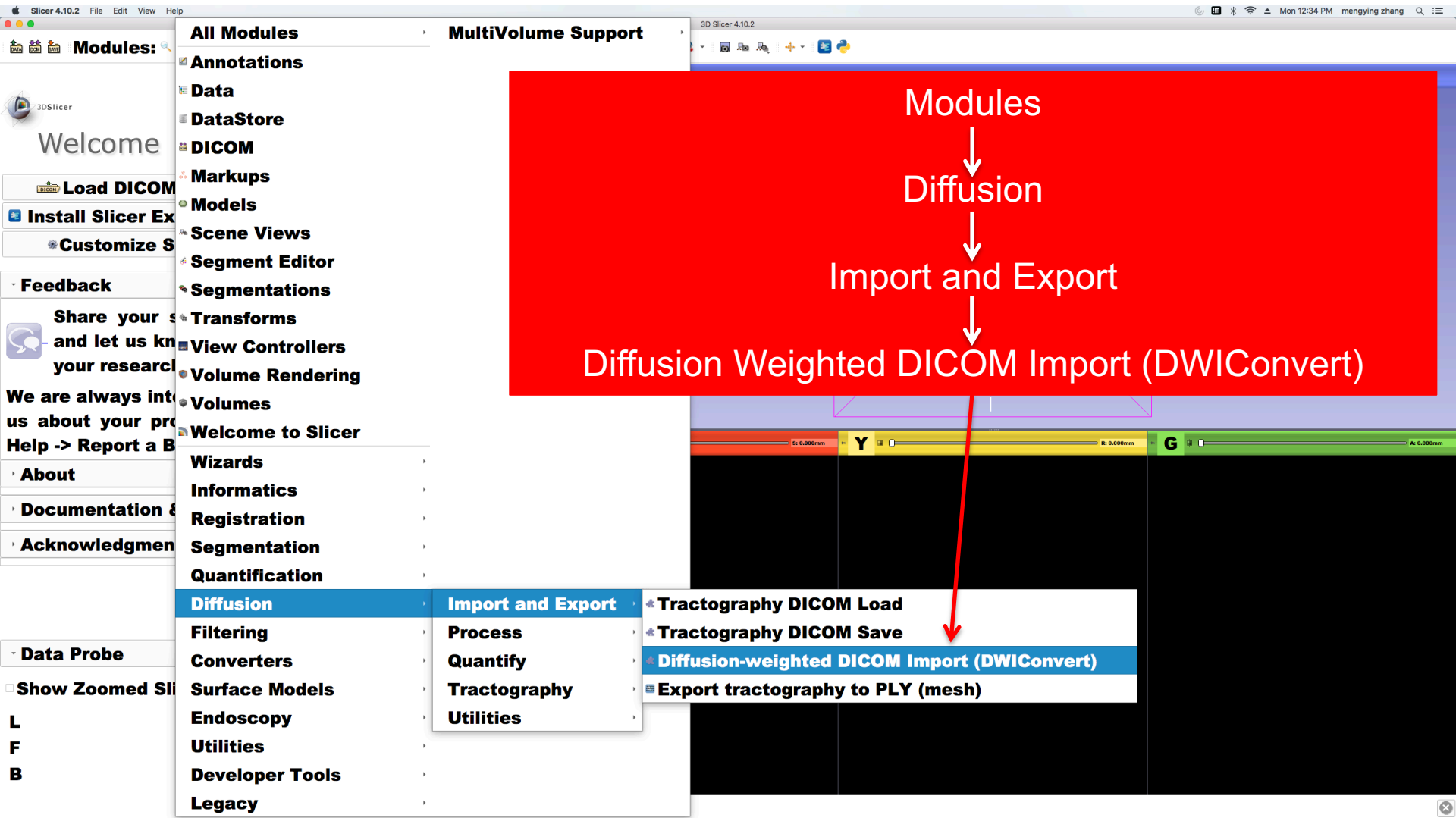
Harvard Medical School



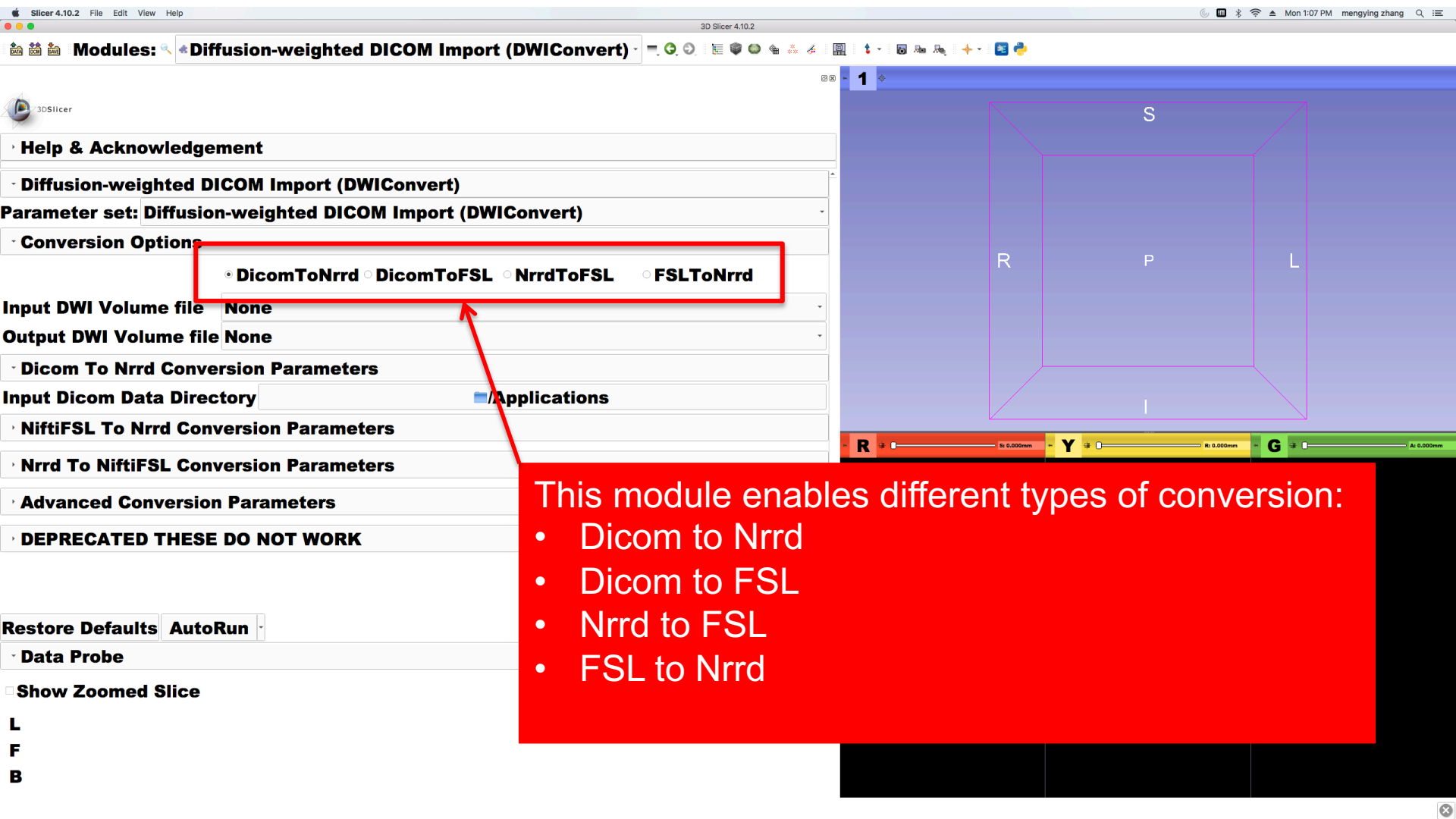
3DSlicer



DWI Converter Module



DWI Converter



DWI Converter

Select DicomToNrrd conversion

▼ Diffusion-weighted DICOM Import (DWIConvert)

Parameter set: Diffusion-weighted DICOM Import (DWIConvert) ▾

▼ Conversion Options

☒ DicomToNrrd ☐ DicomToFSL ☐ NrrdToFSL ☐ FSLToNrrd

Input DWI Volume file None ▾

Output DWI Volume file None ▾

▼ Dicom To Nrrd Conversion

Input Dicom Data Directory

- Rename current DiffusionWeightedVolume
- Create new DiffusionWeightedVolume
- Create new DiffusionWeightedVolume as...
- Delete current DiffusionWeightedVolume

► NiftiFSL To Nrrd Conversion

Create and name your output (Nrrd file)

DWI Converter

The Input DWI Volume file selection should be **None** as it not used for this operation

▼ Diffusion-weighted DICOM Import (DWIConvert)

Parameter set: Diffusion-weighted DICOM Import (DWIConvert)

▼ Conversion Options

☒ DicomToNrrd ☐ DicomToNifti

Input DWI Volume file: None

Output DWI Volume file: Input DWI volume file -- not used for DicomToNrrd mode.

▼ Dicom To Nrrd Conversion Parameters

Input Dicom Data Directory: /Users/fan/Dropbox (Partners HealthCare)/WROK/tutorials

► NiftiFSL To Nrrd Conversion Parameters

In your file archive select the directory that only contains the DWI Dicom files that you want to convert

DWI Converter

The screenshot shows the DWI Converter application window. It has several sections for configuration:

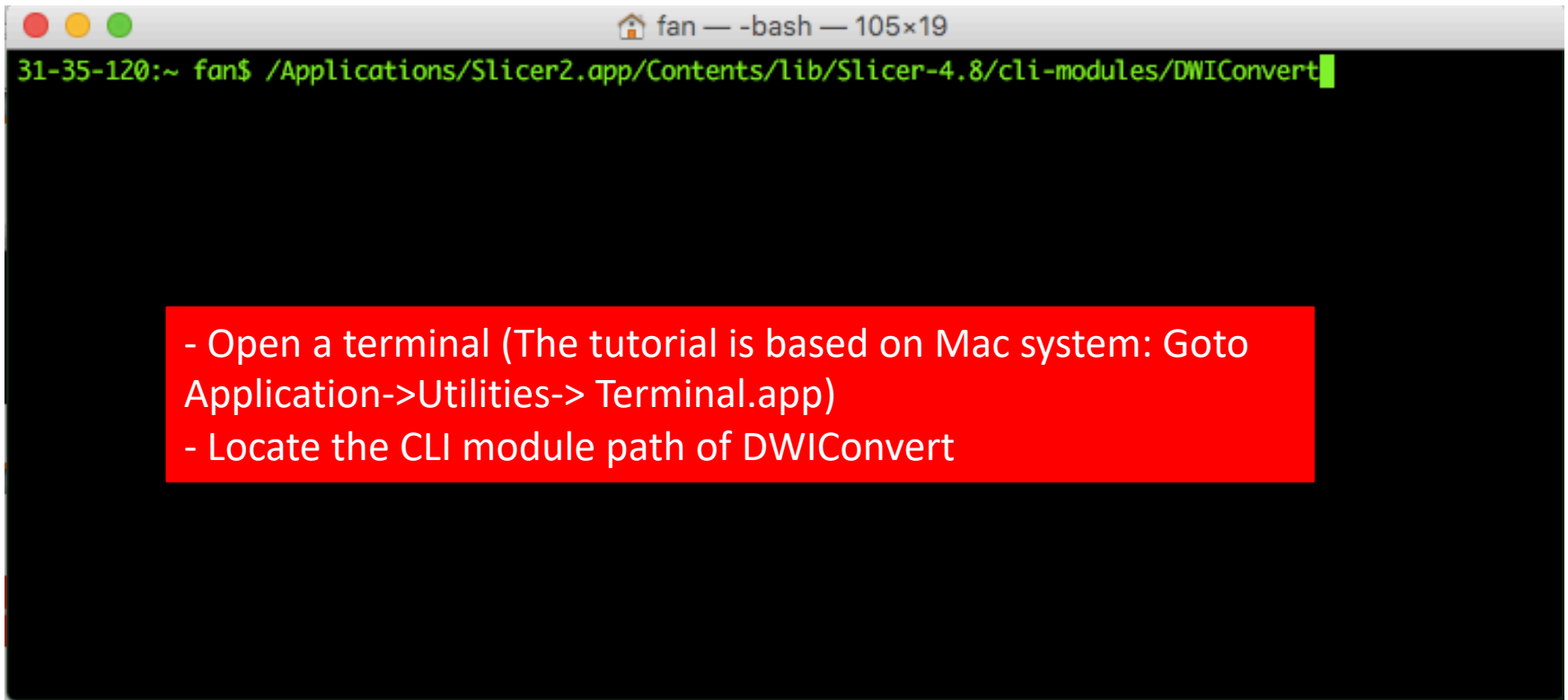
- Dicom To Nrrd Conversion Parameters**: Includes a text field for "Input Dicom Data Directory" containing the path "C:\Program Files\HealthCare\WROK\tutorials".
- NiftiFSL To Nrrd Conversion Parameters**: A section header.
- Nrrd To NiftiFSL Conversion Parameters**: A section header.
- Advanced Conversion Parameters**: Contains several checkboxes: "Write Protocol Gradients File" (unchecked), "Use Identity Measurement Frame" (unchecked), "Use BMatrix Gradient Directions" (checked), "Output Directory" (text field with "/Applications"), "Small Gradient Threshold" (spin box with "0.2"), "Transpose Input BVectors" (checked), and "Allow lossy image conversion" (unchecked).
- DEPRECATED**: A section header.

At the bottom, there are buttons for "Restore Defaults", "AutoRun" (with a dropdown arrow), "Cancel", and "Apply". A status bar at the bottom right shows "Status: Idle".

Four red callout boxes with arrows provide instructions:

- Box 1: "Check this box only for Siemens data" (points to the "Use BMatrix Gradient Directions" checkbox).
- Box 2: "The Nrrd file will be automatically loaded in Slicer and it's not necessary to select an output" (points to the "Output Directory" text field).
- Box 3: "Leave all the other parameters as default and click 'Apply'" (points to the "Apply" button).
- Box 4: (Empty, located near the bottom right).

Using DWI Converter in CLI

A screenshot of a macOS Terminal window. The title bar shows a home icon, the name 'fan', and the shell '-bash' with window dimensions '105x19'. The terminal text is green on a black background, showing the command path to DWIConvert. A red rectangular box is overlaid on the terminal, containing two instructions in white text.

```
31-35-120:~ fan$ /Applications/Slicer2.app/Contents/lib/Slicer-4.8/cli-modules/DWIConvert
```

- Open a terminal (The tutorial is based on Mac system: Goto Application->Utilities-> Terminal.app)
- Locate the CLI module path of DWIConvert

Using DWI Converter in CLI

```
fan — -bash — 99x52
[31-35-120:~ fan$ /Applications/Slicer2.app/Contents/lib/Slicer-4.8/cli-modules/DWIConvert -h]

USAGE:

/Applications/Slicer2.app/Contents/lib/Slicer-4.8/cli-modules/DWIConvert
    --returnparameterfile
    <std::string>
    --processinformationaddress
    <std::string> [--xml] [--echo]
    --deserialize <std::string>
    --serialize <std::string>
    --fMRI [--gradientVectorFile
    <std::string>
    --allowLossyConversion]
    --transposeInputBVectors]
    --smallGradientThreshold <double>]
    --outputDirectory <std::string>
    --useBMatrixGradientDirections]
    --useIdentityMeasurementFrame]
    --writeProtocolGradientsFile]

    --inputValues <std::string>
    --fslNIFTIFile <std::string> [-i
    <std::string> [-o <std::string>]
    --inputVolume <std::string>
    --conversionMode <DicomToNrrd
    |DicomToFSL|NrrdToFSL|FSLToNrrd>]
    [--] [--version] [-h]
```

Run `/Applications/Slicer2.app/Contents/lib/Slicer-4.8/cli-modules/DWIConvert -h` to find detailed documentation of the usage of

DWIConvert

Where:

```
--returnparameterfile <std::string>
Filename in which to write simple return parameters (int, float,
int-vector, etc.) as opposed to bulk return parameters (image,
geometry, transform, measurement, table).
```

Acknowledgements

- U01CA199459, Open Source Diffusion MRI Technology For Brain Cancer Research



- National Alliance for Medical Image Computing (NA-MIC)
namic.org



- National Center for Image Guided Therapy (NCIGT)
ncigt.org



- Neuroimage Analysis Center (NAC)
nac.spl.harvard.edu



- Surgical Planning laboratory (SPL)
spl.harvard.edu
- Tutorial updated by
Mengying Zhang, undergraduate, National University of Singapore