1) Preprocessing using FSL (tool: FSL)

eddy\_correct (to correct for eddy current distortion and motion distortion),

Command: eddy\_correct 1157.nii.gz 1157\_EC 0

bet (to make brain mask)

Command: bet 1157.nii.gz 1157\_brain -m -n -f 0.2

2) correct gradient table and erode mask (pure matlab code)

adjust\_bvecs('1157\_EC.ecclog','dti.bvecs','1157.bvecs');

myerode('1157\_brain\_mask.nii','1157\_mask.nii')

the difference between with myerode and without myerode can be seen from the comparison between dti\_FA.nii and dti\_FA\_mask\_modi.nii

Note: In dti\_FA.nii, the brain edge has lots of high value points, which should be removed before running whole brain tractography.

3) whole brain tractography---tool: diffusion toolkit (<http://trackvis.org/dtk/>)

Using diffusion toolkit, FACT option (there are windows version, Mac version, unix version)

Run bash script run\_dtk.sh to get whole brain tractography (named as : dti\_fact\_tracts.trk)

This step can be run in script mode or GUI mode, so please read run\_dtk.sh and let me know if any problem.

4) Label generation

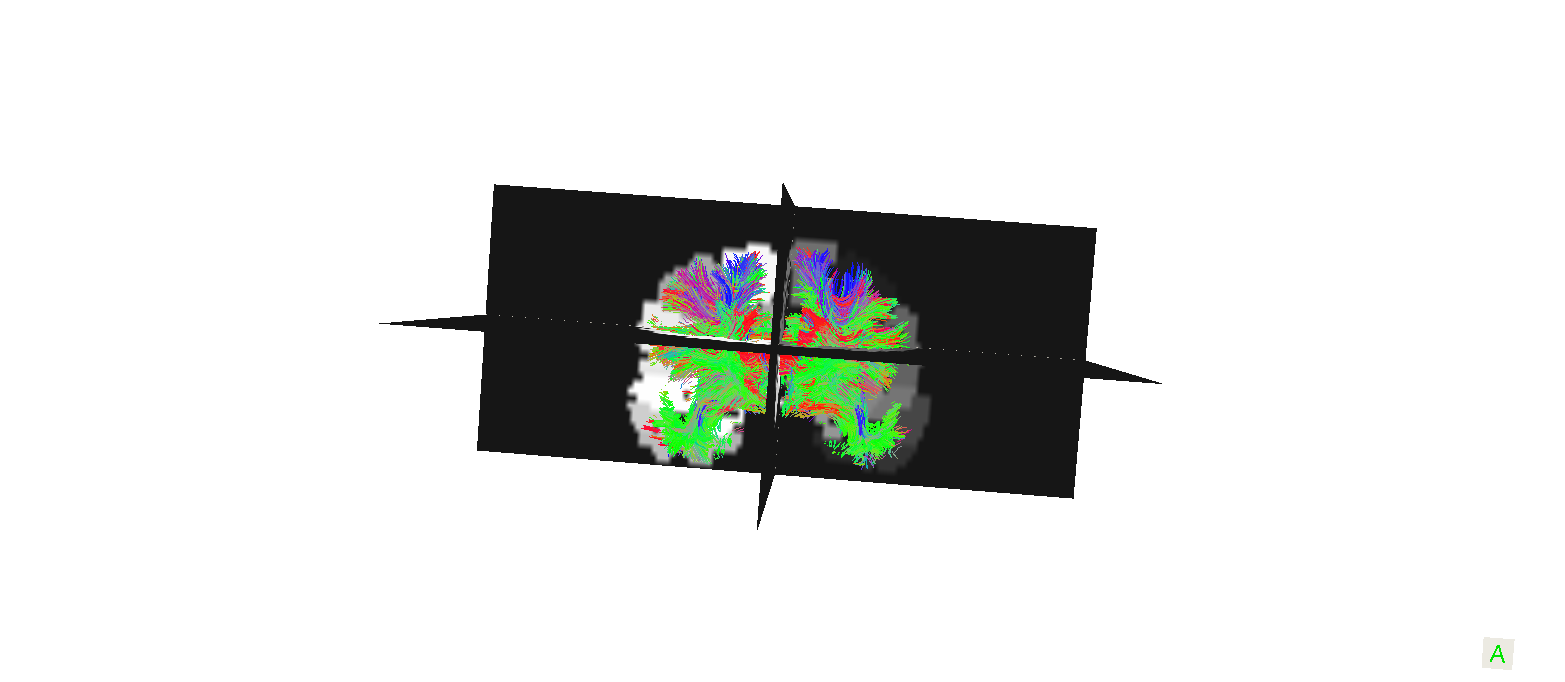
Use Freesurfer + FSL

Run bash script: reg\_FSROI\_Jan2014.sh (Please note you can adjust the dilation\_factor based on what you expect)

Output is: label.nii

5) Compute the network (need label.nii and dti\_fact\_tracts.trk, pure matlab code)

First to overlay label.nii on dti\_fact\_tracts.trk to make sure no orientation mismatch.



Then run matlab code:

compute\_matrix\_May\_23\_2014\_fastversion('dti\_fact\_tracts.trk','label.nii','1157.mat',5)

\*\* dti\_fat\_tracts.trk is computed in step 3

Label.nii is computed in step 4

1157.mat is brain connectivity matrix output

5 is the threshold, to remove those short fibers.