

Diffúziós-tenzoros MR vizsgálatok felhasználási lehetőségei

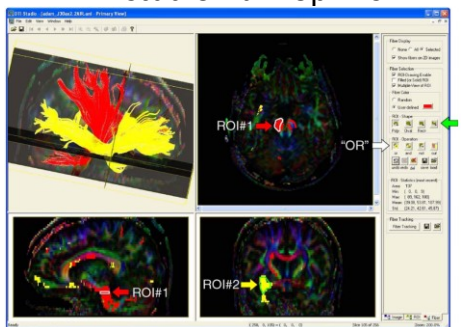
3. Szoftveres lehetőségek ismertetése

Dr. Valálik István

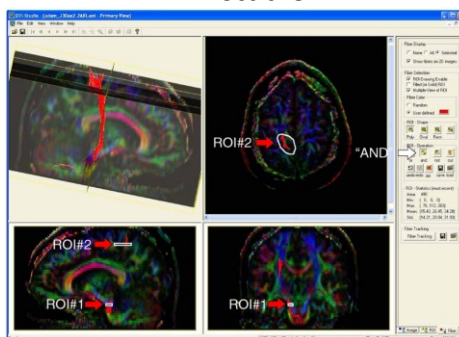
Szoftveres lépések

- Scanner kijövő formátuma DICOM® (Digital Imaging and Communications in Medicine)
- Beolvasás – konvertálás nifti (.nii), nrrd, Analyze, MetaIO, mif
- BE – brain extraction
- Megjelenítés, torzítások, zajok, elmozdulás szűrése
- Regisztrálás atlaszokhoz – MNI-152, NIH Harvard-oxford, Talairach, Juelich, Morel, Mai, SRI24
- Alapszámítások – tenzorok, FA, colormap...
- seed, inclusive, exclusive maszkok, labelok
- Traktográfia – Grafikus megjelenítés, tárolás, exportálás – vtk, X3D, CAD, SVG
- Kvantitatív értékek, statisztikák, konnektivitások...
- 3D nyomtatási formátum: STL, OBJ, AMF, 3MF

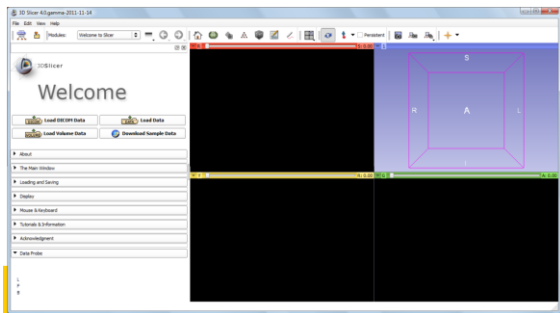
DTI-studio J. Hopkins



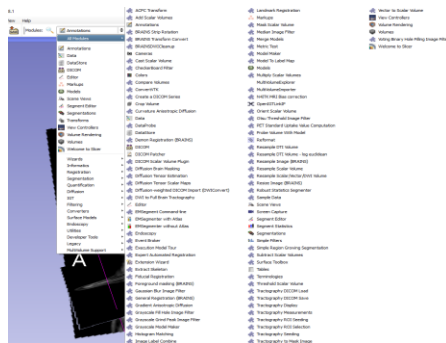
DTI-studio



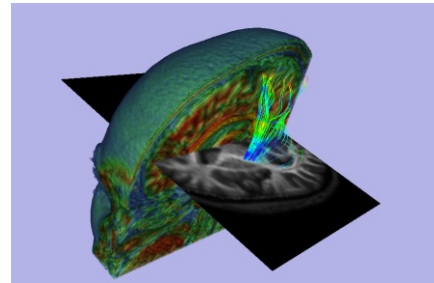
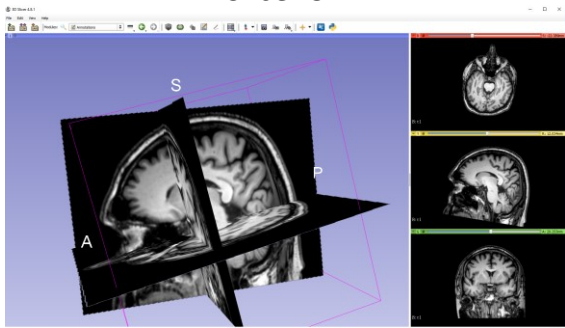
Slicer 3D NIH-Boston



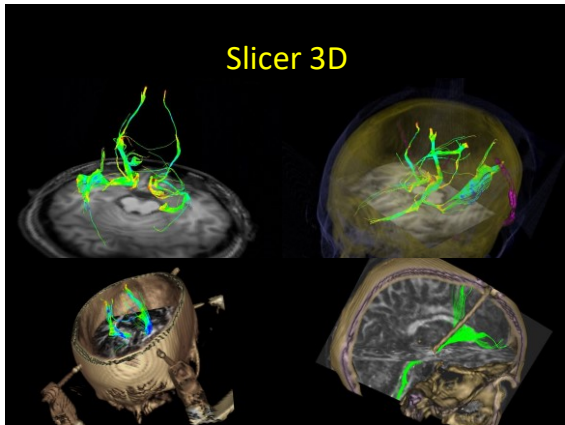
Slicer 3D



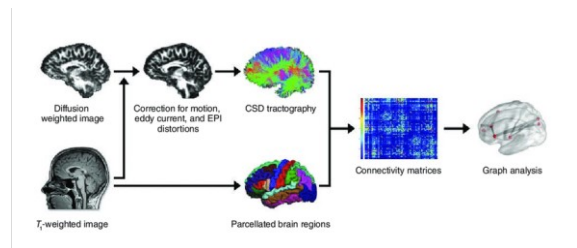
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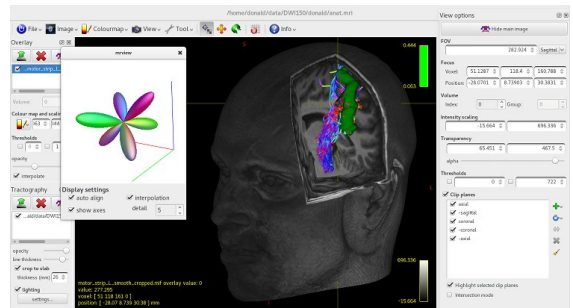
Slicer 3D



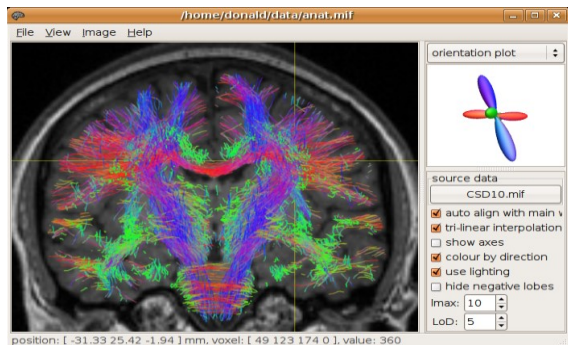
Freesurfer flowchart



MRtrix



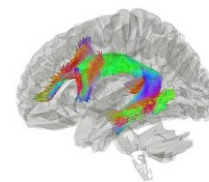
MRTrix



DSI-studio

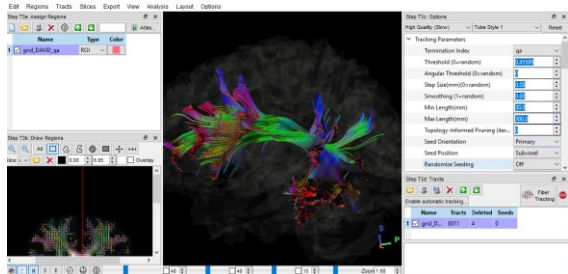
Diffusion spectrum imaging

<http://brain.labsolver.org>
<http://dsi-studio.labsolver.org>
<http://www.neurosurgery.pitt.edu/research/fiber-tractography-lab>



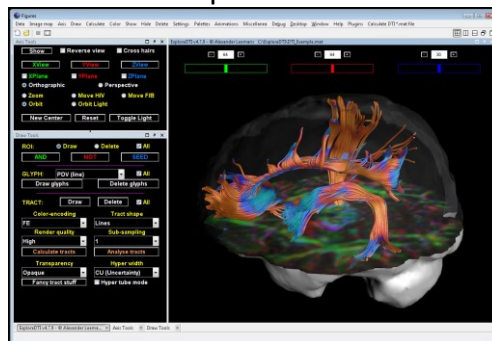
Human Brain MRI Data and Connectome Atlas
 - Diffusion MRI Data: Individuals
 HCP data (WU-Minn)
 HCP data (MGH)
 NTU data
 Coll Phantom
 - Diffusion MRI Data: Templates and Atlas
 ICF 942 and 1021 template
 CMTI 60
 Human Tractography Atlas

DSI-studio

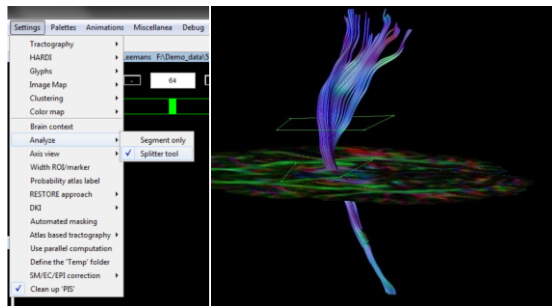


diffusion imaging and structural imaging data acquired from 35 young adults using the customized MGH Siemens 3T Connectome scanner, which has 300 mT/m maximum gradient strength for diffusion imaging.

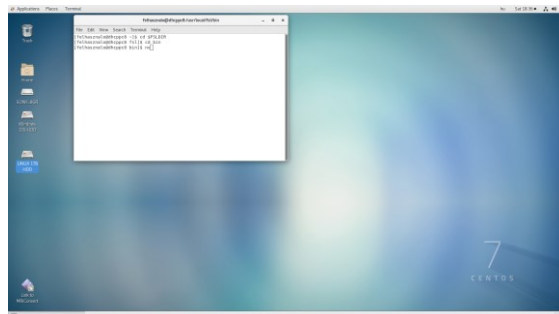
ExploreDTI



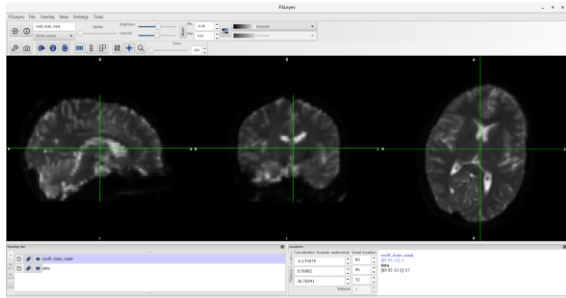
ExploreDTI - Tract segment analysis



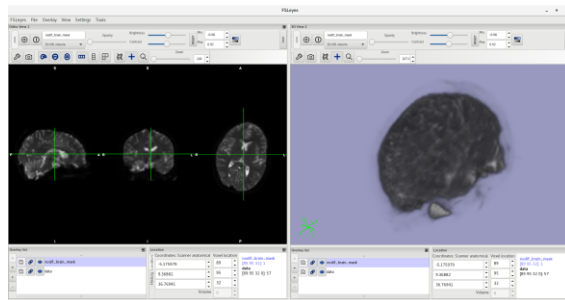
FMRIB software library - FSL



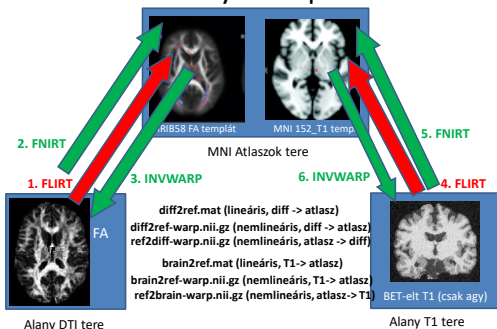
FSL-eyes



FSL-eyes 3D



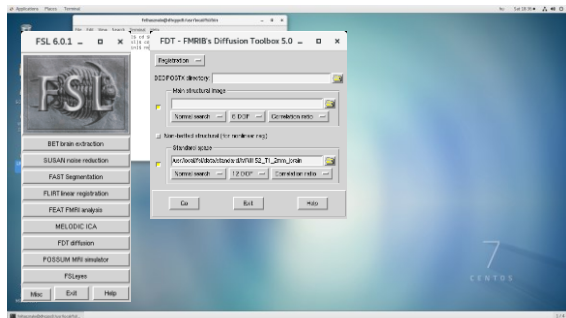
Diffúziós tér regisztrációja templáthoz és alany T1 képéhez



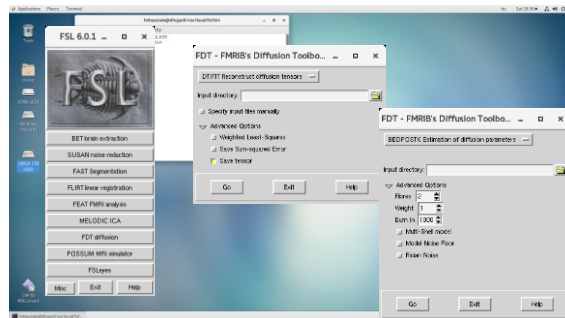
Hogyan történik a traktográfia?

1. Előkészítés: bet (t1 és diff), eddy correction, bedpostX, dtifit (így lesz FA kép).
2. Előző dia regisztrációinak elvégzése
3. Seed régió megadása **atlasz templát** térében
4. Ezután a Protrackx lefut, és az eredmények a **atlasz** terében lesznek
5. Eredmények transzformálása T1 képéhez

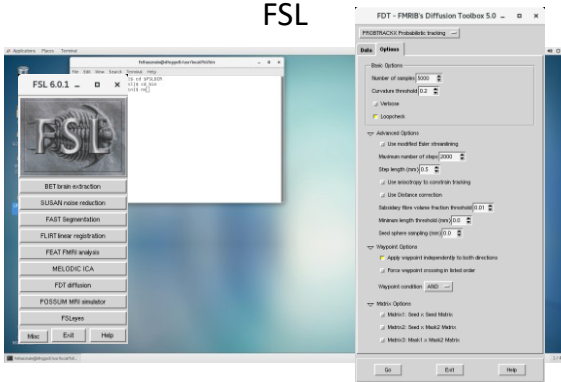
FSL



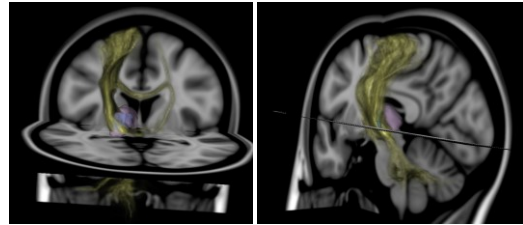
FSL



FSL



Probabilisztikus traktográfia

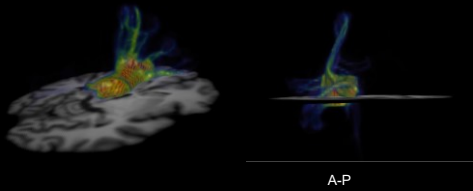


MNI-152 atlas térben

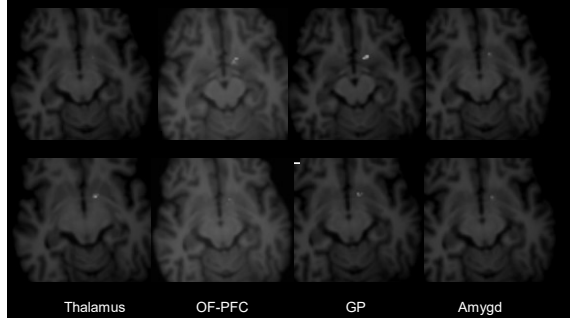
Probabilistic tractography (med+intralam TH)

Connectivities

Vo → PMC
 CM → dorsal motor striatum → GP
 SPv → ventral limbic striatum



Peak voxels of probability for the VC/VS



Köszönöm a figyelmet