

Preparatory Material

Introduction to Neuroimaging and FSL

[Introductory Lecture](#) (2 videos)

Introduction to UNIX

[Practicals](#) (5 video walk-throughs)

[Practical Data](#)

Introductory FSL Practicals

Overview Videos:

[Image Viewer \(FSLeyes\)](#), [Brain Extraction \(BET\)](#), and [Command-line FSL Utils](#)

Written Instructions:

[Image Viewer \(FSLeyes\)](#), [Brain Extraction \(BET\)](#), and [Command-line FSL Utils](#)

[Practical Data](#)

Main Course Material

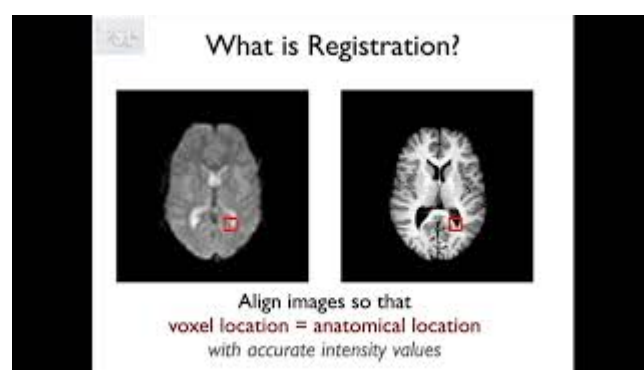
Registration: Image Registration and Distortion Correction

[Pre-Practical Video](#)

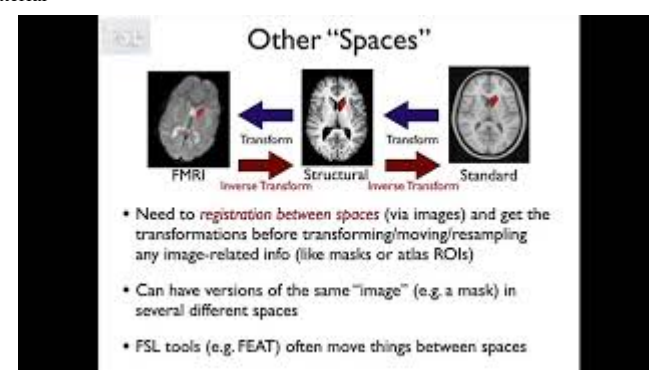
[Practical Instructions \(written\)](#)

1. Introduction to Brain Extraction and Registration

2. Registration: Image Spaces and Spatial Transformations

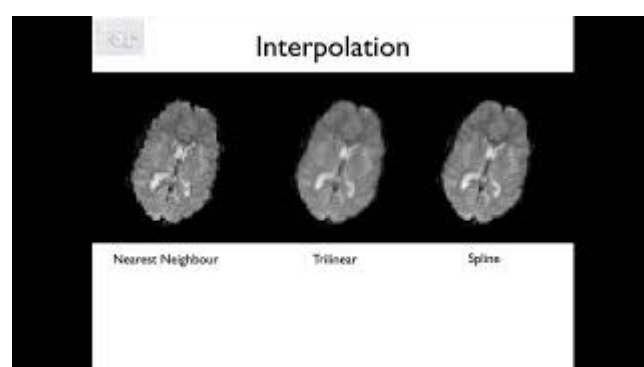


[Play video](#) [PDF slides](#)



[Play video](#) [PDF slides](#)

3. Registration: Cost Functions, Interpolation and Masks



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4. Registration: Single Stage and Multi-Stage Applications



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5. Registration: EPI Distortion Correction and Registration



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6. Registration: Pathological Image Registration and Small FOV



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Structural: Segmentation and Structural Analysis

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[Practical Instructions \(written\)](#)

7. Segmentation: FAST



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8. Segmentation: Subcortical Brain Structures and FIRST



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9. Segmentation: White Matter Hyper-intensities and BIANCA



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10. Segmentation: Structural Analysis using FSL VBM and SIENA




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fMRI 1: Statistics & Task fMRI: Basic GLM and Single-Subject Analysis


[Pre-Practical Video](#)

[Practical Instructions \(written\)](#)


11. FMRI1:
Introduction to
Task FMRI
Experiments
and Analysis


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12. FMRI1:
Preprocessing


[Play video](#) [PDF slides](#)

13. FMRI1:
Introduction to
Single Session
Analysis and
GLM Basics


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14. FMRI1:
Modelling and
Statistics



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fMRI 2: Statistics & Task fMRI: Inference and Group Analysis


[Pre-Practical Video](#)

[Practical Instructions \(written\)](#)


15. FMRI2:
Group
Analysis,
Fixed/Mixed
Effects,
FLAME and
OLS


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16. FMRI2:
Examples
of Group
FMRI
Analysis


[Play video](#) [PDF slides](#)


17. FMRI2:
Multi-
Session
Analysis
and
Covariates


[Play video](#) [PDF slides](#)


18. FMRI2:
Inference,
Null
Hypothesis
Testing, and
Multiple
Comparisons


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19. FMRI2:
Inference -
Quantifying
Surprise in
Imaging


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20. FMRI2: Parametric Vs. Non-
parametric Tests


[Play video](#) [PDF slides](#)

21. FMRI2: Threshold Free Cluster
Enhancement and False Discovery
Rate



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fMRI 3: Statistics & Task fMRI: Advanced GLM and Noise Correction


[Pre-Practical Video](#)

[Practical Instructions \(written\)](#)


22. FMRI3:
Pipeline
Overview


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23. FMRI3:
Advanced
Preprocessing



24. FMRI3:
Demeaning
EVs


[Play video](#) [PDF](#)

25. FMRI3:
Advanced
Analysis,
Parametric
Designs



26. FMRI3:
Advanced
Analysis,
Factorial
Designs

[slides](#)

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[slides](#)

[Play video](#) [PDF slides](#)

and Interactions



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27. FMRI3: Advanced Analysis, Correlation of EVs and Design Efficiency



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Resting State (ICA): Resting-State fMRI: ICA and Dual Regression

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[Practical Instructions \(written\)](#)

28. Resting State: Introduction to Resting State FMRI and ICA



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29. Resting State: Independent Component Analysis



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30. Resting State: Single Subject ICA



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31. Resting State: Multi-Subject ICA and Dual Regression



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Resting state (FSLNets): Resting-State fMRI: Network Analysis with FSLNETS

[Pre-Practical Video](#)

[Practical Instructions \(written\)](#)

32. Resting State: Preprocessing



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33. Resting State: Network Modelling Analysis, Node Definition and Edge Calculation



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34. Resting State: Network Modelling Analysis, Group Analysis and Challenges



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35. Resting State: Comparison of Resting State Methods



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Diffusion (DTI): Diffusion: Diffusion Tensor Imaging and TBSS

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[Practical Instructions \(written\)](#)

36. Diffusion 1:
Tour of DTI in
FSL



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37. Diffusion 1:
DTI Basic
Principles



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38. Diffusion 1:
Tract Based
Spatial Statistics
(TBSS)



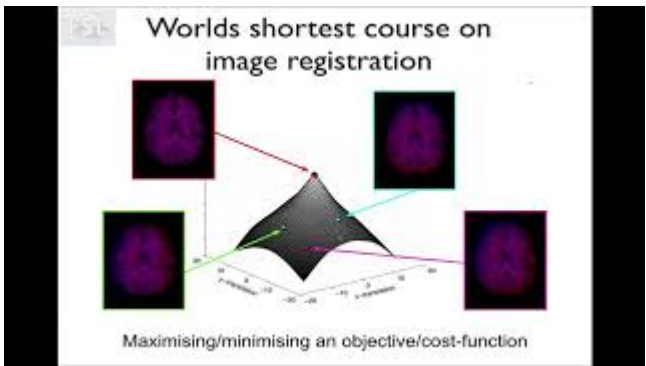
[Play video](#) [PDF slides](#)

39. Diffusion 2:
Distortion and
Movement
Correction



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40. Diffusion 2: Distortion and
Movement Correction 2



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41. Diffusion 2:
Distortion and
Movement Correction
3



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Diffusion 2: Extra
Slice (Eddy
Advanced Features)



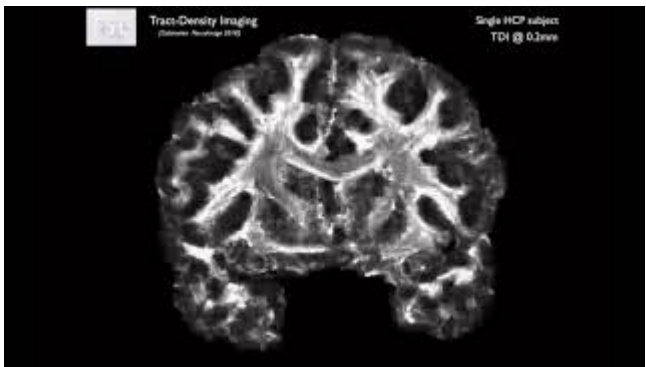
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Diffusion (Tractography): Diffusion: Diffusion Tractography

[Pre-Practical Video](#)

[Practical Instructions \(written\)](#)

42. Diffusion Tractography:
Goals of Tractography



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43. Diffusion
Tractography:
Estimating Fibre
Orientations:
BEDPOSTX



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44. Diffusion
Tractography:
Probabilistic
Tractography:
PROBTRACKX



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45. Diffusion Tractography:
PROBTRACKX Outputs



46. Diffusion Tractography:
Tractography Limitations



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ASL

[ASL Practical Instructions \(written\)](#)

47. ASL
Introduction



[Play video](#)

48. ASL
Acquisition



[Play video](#)

49.
Analysis of
ASL data



[Play video](#)

50. Further
Quantification
of ASL data



[Play video](#)

51. Group
Analysis
using ASL
data



[Play video](#)

52. Advanced Analysis Methods



[Play video](#)

MRS

[MRS Practical Instructions \(written\)](#)

MRS 1:
Introduction



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MRS 2:
Preprocessing



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MRS 3:
Model
fitting



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[PDF slides](#)

MRS 4:
Data
Quality



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[PDF slides](#)

MRS 5:
FSL-MRS
Tools



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[PDF slides](#)

PROFUMO

[Pre-Practical Video](#)

[PFM Practical Instructions \(written\)](#)

Probabilistic Functional
Modes (Part 1)



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Probabilistic Functional
Modes (Part 2)



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Probabilistic Functional
Modes (Part 3)



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