**SPM batch Joost**9-10-2014, Lieneke 31-8-2017, Monja

WMAG data

* 3T
* functional MRI data
* multi-echo
* nPrescans = 30
* TR: 2.08
* Slices: 34
* nEchoes = 4

**Steps**

**Copy per participant EPIs 🡪 WMAG, T1🡪 T1**

**Combined directory: PAID\_data**

**Converted directory: converted\_Volumes**

**Combine echoes** *(fraleo code: H:\common\matlab\spm\_batch\fraleo\dmb?)*

* dicoms 🡪 nii
* realign estimate, realign write -- prescan volumes are aligned -- first echo volumes are realigned to the first volume of first echo, reslicing,
* Smoothing is applied to weight calculation volumes' (kernel ratio = 1.2 (ratio of the voxel size of functional volumes)
* Apply weighting
* combine echoes based on weights estimated based on 30 prescans

*(weights saved: PAIDweight dir)*

**Convert T1**

* **192 images 🡪 1 nii file**

|  |  |  |
| --- | --- | --- |
| **Module 1: Check spikes** |  | |
| Help on: Check spikes | Check spikes Checks for (and removes) spikes. | |
| Data | Recombined images (excl. weighting scans) | |
| Mode | Remove | |
| Look for other echoes? | Off | |
| Output directory | ~/info\_xxxx/spikecheck  xxxx = how you named your recombined series | |
| Number of sessions | 1 | |
|  |  | |
| **Module 2: Slice Timing DEP** |  | |
| Help on: Slice Timing | Slice Timing  Correct differences in image acquisition time between slices. Slice-time corrected files are appended with an ‘a’. | |
| Data |  | |
| . Session | DEP Check spikes: Data all sessions | |
| Number of Slices | 32 | |
| TR | 2.09 | |
| TA | 2.0247 (TR-(TR/32)) | |
| Slice order | 1x32 double  [1:1:32]  This means “ascending” | |
| Reference Slice | 16 | |
| Filename Prefix | a | |
|  |  | |
| **Module 3: Coregister: Estimate DEP** | **EPI to template EPI** | |
| Help on: Coregister: Estimate |  | |
| Reference Image | ~/spm8/templates/EPI.nii, 1 | |
| Source Image | ~/func\_xxxx/PAID\_data/mean\_echo1\_fmri\_preproc.nii, 1 | |
| Other Images | Reference from Slice Timing: Slice Timing Corr. Images (Sess 1) | |
| Estimation Options |  | |
| . Objective Function | Normalised Mutual Information | |
| . Separation | [4 2] | |
| . Tolerances | 1x12 double  [0.02 0.02 0.02 0.001 0.001 0.001 0.01 0.01 0.01 0.001 0.001 0.001] | |
| . Histogram Smoothing | [7 7] | |
|  |  | |
| **Module 4: Coregister: Estimate** | **T1 to template T1** | |
| Reference Image | ~/spm8/templates/T1.nii, 1 | |
| Source Image | ~/T1/T1\_fmri\_preproc.nii, 1 | |
| Other Images | *[empty]* | |
| Estimation Options |  | |
| . Objective Function | Normalised Mutual Information | |
| . Separation | [4 2] | |
| . Tolerances | 1x12 double  [0.02 0.02 0.02 0.001 0.001 0.001 0.01 0.01 0.01 0.001 0.001 0.001] | |
| . Histogram Smoothing | [7 7] | |
|  |  | |
| **Module 5: Segment** |  | |
| Help on: Segment |  | |
| Data | ~/T1/T1\_fmri\_preproc.nii, 1 | |
| Output Files |  | |
| . Grey Matter | Native Space | |
| . White Matter | Native Space | |
| . Cerebro-Spinal Fluid | Native Space | |
| . Bias Corrected | Save Bias Corrected | |
| . Clean up any partitions | Don't do cleanup | |
| Custom |  | |
| . Tissue Probability maps | 3 files:  /home/common/matlab/spm8/tpm/grey.nii  /home/common/matlab/spm8/tpm/white.nii  /home/common/matlab/spm8/tpm/csf.nii | |
| . Gaussians per class | [2 2 2 4] | |
| . Affine Regularisation | ICMB space template – European brains | |
| . Warping Regularisation | 1 | |
| . Warp Frequency Cutoff | 25 | |
| . Bias regularisation | very light regularization (0.0001) | |
| . Bias FWHM | 60 mm cutoff | |
| . Sampling distance | 3 | |
| . Masking image | *[empty]* | |
|  |  | |
| **Module 6: Coregister: Estimate DEP** | | **EPI to Bias Corrected T1** |
| Help on: Coregister: Estimate |  | |
| Reference Image | DEP Segment: Bias Corr Images | |
| Source Image | ~/func\_xxxx/PAID\_data/mean\_echo1\_fmri\_preproc.nii, 1 | |
| Other Images | Reference from Coregister: Estimate: Coregistered Images | |
| Estimation Options |  | |
| . Objective Function | Normalised Mutual Information | |
| . Separation | [4 2] | |
| . Tolerances | 1x12 double  [0.02 0.02 0.02 0.001 0.001 0.001 0.01 0.01 0.01 0.001 0.001 0.001] | |
| . Histogram Smoothing | [7 7] | |
| **Module 7: Normalise: Write DEP** |  | |
| Help on: Normalise: Write |  | |
| Data |  | |
| . Subject |  | |
| . . Parameter File | Reference from  Segment: Norm Params Subj - > MNI | |
| . . Images to Write | Reference from  Coregister: Estimate: Coregistered Images | |
| Writing Options |  | |
| . Preserve | Preserve Concentrations | |
| . Bounding box | 2x3 double  [-78 -112 -50  78 76 85] | |
| . Voxel sizes | [2 2 2] | |
| . Interpolation | Trilinear | |
| . Wrapping | No wrap | |
| . Filename Prefix | w | |
|  |  | |
| **Module 8: Normalise: Write DEP** |  | |
| Help on: Normalise: Write |  | |
| Data |  | |
| . Subject |  | |
| . . Parameter File | Reference from  Segment: Norm Params Subj - > MNI | |
| . . Images to Write | DEP (4 outputs)  Reference from  Segment: Bias Corr Images  Segment: c1 Images  Segment: c2 Images  Segment: c3 Images | |
| Writing Options |  | |
| . Preserve | Preserve Concentrations | |
| . Bounding box | 2x3 double  [-78 -112 -50  78 76 85] | |
| . Voxel sizes | [2 2 2] | |
| . Interpolation | Trilinear | |
| . Wrapping | No wrap | |
| . Filename Prefix | w | |
|  |  | |
| **Module 9: Smooth** |  | |
| Help on: Smooth |  | |
| Images to Smooth | Reference from  Normalise: Write: Normalised Images (Subj 1) | |
| FWHM | [8 8 8] | |
| Data Type | SAME | |
| Implicit masking | No | |
| Filename Prefix | s | |

Preprocessing

1. Combine echos
2. Motion correction (?)
3. Slice time correction

-number of slices -TR (2.09) -TA = TR-(TR/nslices)in sec - order

1. Co-registration

- reference: structural

-source: mean functional

- other images: functional scans (output from 3)

1. Segmentation

- structural

1. Normalization

-ge-segmenteerde -> MNI

- write: Coregistered images

-write: structurele

1. Smoothing

-smooth normalized images- 8mm