LIFE Followup-data (31.1.2019)

1. **Getting the data from mriincoming** 
   1. Use the script /data/p\_life\_raw/scripts/Followup/copy\_fu\_data\_life.sh from the folder (in a bash shell: ./copy\_fu\_data\_life.sh)

It saves all participants not yet saved (for all saved so far, see list: /data/p\_life\_raw/scripts/Followup/life\_FU\_done.txt) to /data/p\_life\_raw/patients.

This should be done on a regular basis (e.g. weekly as MRI data is saved on MR incoming for 10 days)

1. **Run the script with structural/functional basic preprocessing and create a report**
   1. get the script from <https://github.com/fBeyer89/life_followup_preproc> and follow instructions
   2. Load AFNI version='17.2.17n', ANTSENV version '2.2.0', FREESURFER –version 5.3.0 (also loads FSL automatically) with the script environment.sh and start nip14\_lifefu environment: source activate nip14\_lifefu (based on conda, can be imported from github folder py2\_environment\_for\_preprocessing.yml)
   3. Defaults are set in the config file and here you also have to add the subject list you want to process in the configuration file: conf\_for\_LIFE\_FU.conf
   4. Run the processing with python run\_workflow\_hcplike.py --run -n 8 --config conf\_for\_LIFE\_FU.conf
   5. Outputs are in
      1. Working directory: /data/pt\_life/LIFE\_fu/wd\_preprocessing
      2. Freesurfer outputs: /data/pt\_life\_freesurfer/freesurfer\_all with subjects called LI….\_fu
      3. Registration to MNI space: /data/pt\_life\_restingstate\_fu/preprocessed/structural
      4. Functional preprocessing: /data/pt\_life\_restingstate\_fu/preprocessed/resting/
      5. Reports created:

/data/p\_life\_raw/documents/fu\_reports

1. If the pipeline ran well, no errors, that’s a good sign already!
2. Check the reports:
   1. T1 and brain mask: check if brain mask is roughly ok, not too much pial included or entire brain lobes excluded.
   2. FLAIR image: check overall image quality, whether any spikes or other artefacts are present.
   3. B0\_mean\_image: check overall image quality, whether any spikes or other artefacts are present. Particularly check for chemical shift artifact (skull fat shifted into brain tissue)
   4. B\_images: check overall image quality, whether any spikes or other artefacts are present. Particularly check for chemical shift artifact (skull fat shifted into brain tissue)
   5. Mean EPI: check for overall image quality (no larger signal dropouts in temporal lobe etc)
   6. tSNR: temporal standard deviation of the BOLD timeseries of each voxel. Large values indicate large standard deviations, spikes would also be seen as large values. It’s normal that in temporal/more caudal brain regions the tSNR is higher.
   7. Motion parameters from the rs-scan: Framewise displacement over the timecourse of the scan is plotted. If FD exceeds 0.2 mm (the red line), the frame is considered “bad” and would be scrubbed in additional analysis. If mean FD exceeds 0.5 mm or maxFD exceeds 3mm it is considered gross motion and the subject might be excluded as a whole.
   8. Fieldmap correction: upper image is the distorted EPI while the lower image should be the undistorted scan. Check especially in frontal areas whether the distortion is improved in the correct direction. Otherwise, the phase encoding direction might have been swapped accidentally during scanning.
   9. Coregistration: coregistraion of the functional to the anatomical scan. Red lines represent the white/gray matter boundary and should approximately fit the functional scan.
3. **Physiological parameter preprocessing:**
   1. Open Matlab using MATLAB in the terminal (on some compute server)
   2. Open /home/raid1/fbeyer/Documents/Scripts/LIFE\_followup\_QA/physio\_preproc/run\_physio\_preproc\_withoutmatlab.m and modify the subjects to be processed. All other parameters are defaults and should be correct.
   3. Run the script in matlab.
   4. Results are in /data/pt\_life\_restingstate\_followup/physio/.

Participants who have not been scanned at baseline, just have their DICOMS copied to /data/pt\_life/data\_fbeyer/testing\_LIFE\_fu/. No further preprocessing is done for them.