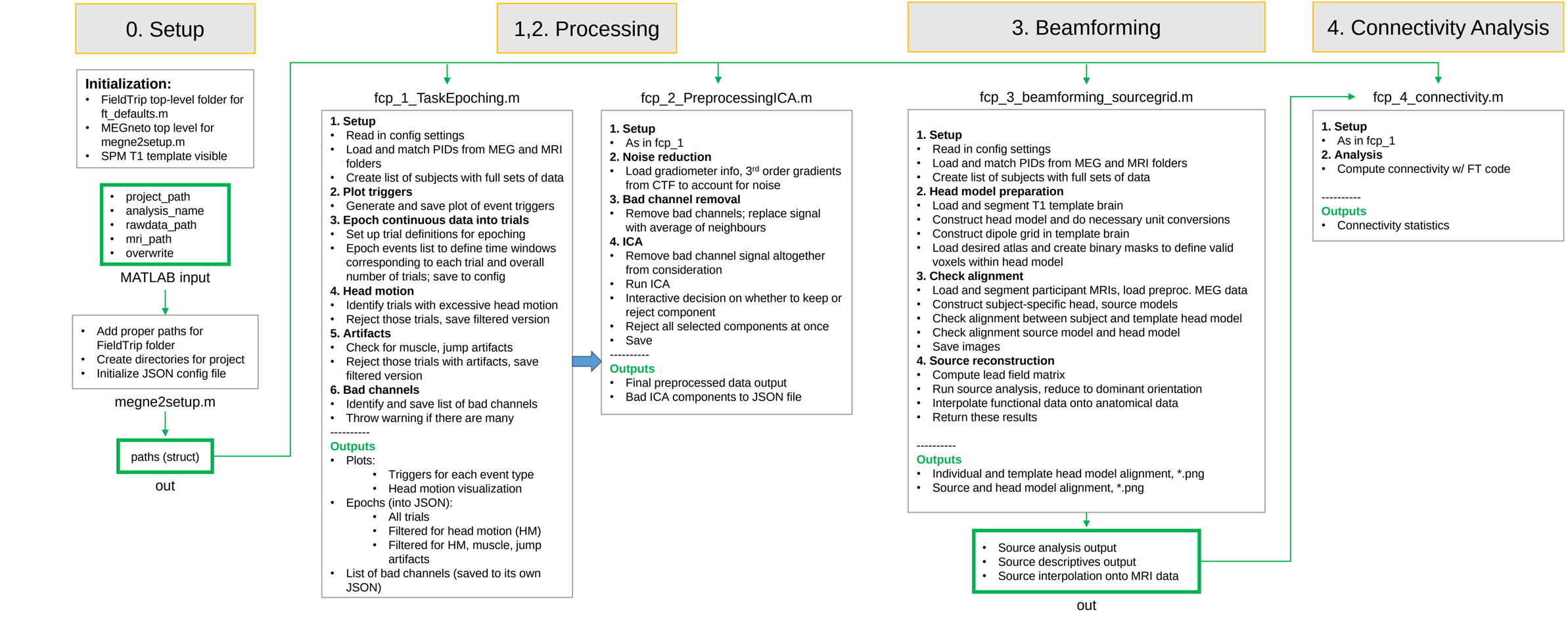
0. Setup
1,2. Processing
3. Beamforming
4. Connectivity Analysis
Initialization:
FieldTrip top-level folder for ft_defaults.m
MEGneto top level for megne2setup.m
SPM T1 template visible
project_path
analysis_name
rawdata_path
mri_path
overwrite
MATLAB input
Add proper paths for FieldTrip folder
Create directories for project
Initialize JSON config file
megne2setup.m
paths (struct)
out
fcp_1_TaskEpoching.m
1. Setup
Read in config settings
Load and match PIDs from MEG and MRI folders
Create list of subjects with full sets of data
2. Plot triggers
Generate and save plot of event triggers
3. Epoch continuous data into trials
Set up trial definitions for epoching
Epoch events list to define time windows corresponding to each trial and overall number of trials; save to config
4. Head motion
Identify trials with excessive head motion
Reject those trials, save filtered version
5. Artifacts
Check for muscle, jump artifacts
Reject those trials with artifacts, save filtered version
6. Bad channels
Identify and save list of bad channels
Throw warning if there are many
Outputs
Plots:
Triggers for each event type
Head motion visualization
Epochs (into JSON):
All trials
Filtered for head motion (HM)
Filtered for HM, muscle, jump artifacts
List of bad channels (saved to its own JSON)
fcp_2_PreprocessingICA.m
1. Setup
As in fcp_1
2. Noise reduction
Load gradiometer info, 3rd order gradients from CTF to account for noise
3. Bad channel removal
Remove bad channels; replace signal with average of neighbours
4. ICA
Remove bad channel signal altogether from consideration
Run ICA
Interactive decision on whether to keep or reject component
Reject all selected components at once
Save
Outputs
Final preprocessed data output
Bad ICA components to JSON file
fcp_3_beamforming_sourcegrid.m
1. Setup
Read in config settings
Load and match PIDs from MEG and MRI folders
Create list of subjects with full sets of data
2. Head model preparation
Load and segment T1 template brain
Construct head model and do necessary unit conversions
Construct dipole grid in template brain
Load desired atlas and create binary masks to define valid voxels within head model
3. Check alignment
Load and segment participant MRIs, load preproc. MEG data
Construct subject-specific head, source models
Check alignment between subject and template head model
Check alignment source model and head model
Save images
4. Source reconstruction
Compute lead field matrix
Run source analysis, reduce to dominant orientation
Interpolate functional data onto anatomical data
Return these results
Outputs
Individual and template head model alignment, *.png
Source and head model alignment, *.png
Source analysis output
Source descriptives output
Source interpolation onto MRI data
out
fcp_4_connectivity.m
1. Setup
As in fcp_1
2. Analysis
Compute connectivity w/ FT code
Outputs
Connectivity statistics
ft_defaults
path_generation
save_to_json
path_check
load_config
load_participants
ds_pid_match
write_match_if_not_empty
ft_definetrial
plotTriggers
HeadMotionTool
ft_artifact_muscle
ft_artifact_jump
ft_rejectartifact
save_to_json
detectBadChannels
load_config
load_participants
ds_pid_match
write_match_if_not_empty
save_to_json