EEG Processing Pipeline

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May 2019

Import, epoch, filter

1. Import raw data into EEGLab
2. Save .set file
3. Import .set file into FieldTrip
4. Define trials
    - All trial onset triggers
    - Pre-stim: 100 ms
    - Post-stim: 1000 ms
    - Only correct trials
5. Pre-process all data
    - Low-pass filter: 40 Hz
    - High-pass filter: 0.5 Hz
    - De-mean
    - Re-reference: Averaged mastoids
6. Re-ref / mean HEOG channels
7. Re-ref / mean VEOG channels
8. Mean mastoids
9. Re-combine EOG and M channels with rest of data
10. Pass to automatic rejection

Automatic rejection

Four types of artifacts detected and rejected:

1. EOG - FieldTrip default parameters; EOG channels only
2. Z-value - z-threshold at 20; EEG channels
3. Threshold - range within 1500 μV
4. Jump - sudden, extreme changes in amplitude

Visual rejection

1. In summary view, identify and toggle individual trials that are skewing the data
2. If necessary, scan trial by trial to identify channels or trials that are anomalous

ICA Decomposition

Learn 25 components that explain the most variance in the data.

Component rejection

1. Identify which components result from ocular, movement, or electrode artifacts.
2. Remove components

Time-lock analysis

1. Interpolate missing channels, averaging over neighbors
2. Separate into conditions
3. Calculate mean for each condition
4. Timelock baseline for -100 to 0 ms
5. Subtract conditions for comparison