EEG PROCESSING WORKFLOW

Load Data, Pre-processing

Load raw data
(***CREx_EEGPipeline.m***)

Load the raw continuous data. The pipeline current loads data in *.BDF format (Biosemi data format). A single dataset corresponds to the continuous data of an individual participant.
The pipeline is applied to each dataset one at a time.

Load in a text file containing the parameters to apply
in the current pipeline. These parameters are defined by the user and
should remain the same for the processing of all datasets. The pipeline
expects the text file to have the title (PipelineParameters.txt).

Load in text file with the pipeline parameters. (PipelineParameters.txt)

The parameters in the texfile are saved as a *.json file (prep for BIDS format)

Define scalp, external and auxiliary channels.
Define channels to discard.

Add channel information.
(standard-10-5-cap385.elp)

Call of **ERPLAB** function to add **EVENTLIST** field to the current EEG structure.
Ideally, this should be carried out before applying the **clean_rawdata()** plugin
as this removes noisy time intervals of data and could distort the order of triggers described in the BDF (bin descriptor file) textfile.

Load in BDF (Bin Definition File) which details trigger coding.
Format: *.txt

Resample
(if specified)

Data Cleaning

YES Apply ***Cleanline*** algorithm ? **NO**

The Cleanline algorithm corrects the 50Hz interference. Its use implies avoiding the need to apply a low-pass filter out this line noise. To function correctly, the data needs to be detrended before applying the Cleanline algorithm. This means applying a very strict highpass with a 1Hz cutoff.
Pour le moment le Cleanline is applied by default in the pipeline.

Detrend
(high pass filter at 1Hz)

Apply ***Cleanline***
algorithm

Average **Re-reference data 1** **Linked Mastoid**

Clean data using ***clean_rawdata*** EEGLAB plugin.

Clean data using ***clean_rawdata*** EEGLAB plugin.

Re-reference data 2
if **average reference**,
Recalculate average reference after bad channel detection.

Post-Processing

High-pass filter (<= 0.3Hz)

Low-pass filter
(if specified)

The **infomax** algorithm as implementd in EEGLAB (r***unica()***) is applied.
Future version will give option of applying **AMICA** algorithm.

Independent Component Analysis (ICA)

ICLabel plugin
Automatic detection of artifact-related components.

Interpolation of removed electrodes

Data ready for segmentation.

https://github.com/deebeebolger/CREx_EEGPipeline2023.git
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