EEGpal: a new graphical user interface for performing automatic and semi-automatic EEG processing and analysis

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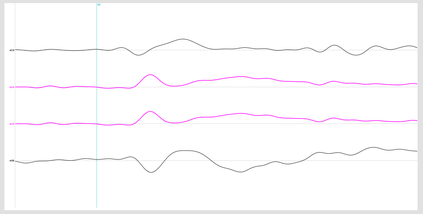
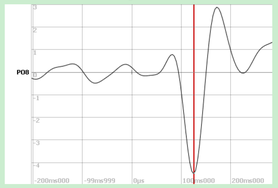
EEGpal is an open-source Matlab-based software for automated/semi-automated EEG data pre-processing and analyses. It proposes Graphical User Interfaces (GUIs) that allow EEG pre-processing to be batched across participants with a high degree of flexibility in processing parameters. The purpose is to offer a complement to the free software Cartool and an alternative to the original eeglab GUI.

Bridge Detection

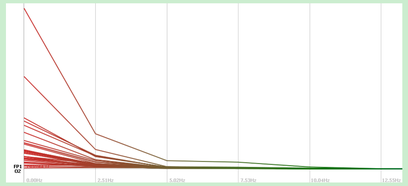


Analysis

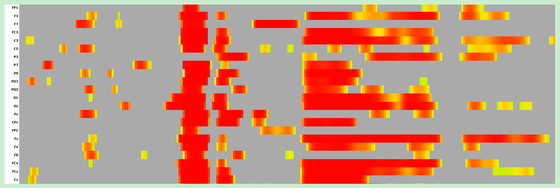
Automatic peak amplitude and latency extraction



Frequency analysis with Power Spectral density (PSD)

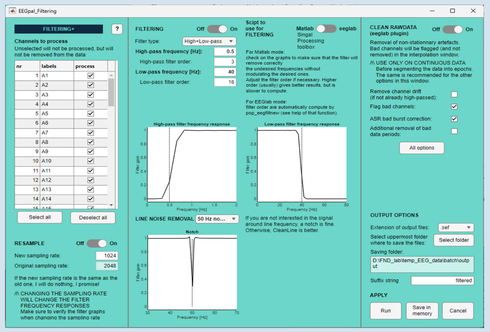


Statistic on tracks with T-test or ANOVA



Filtering+

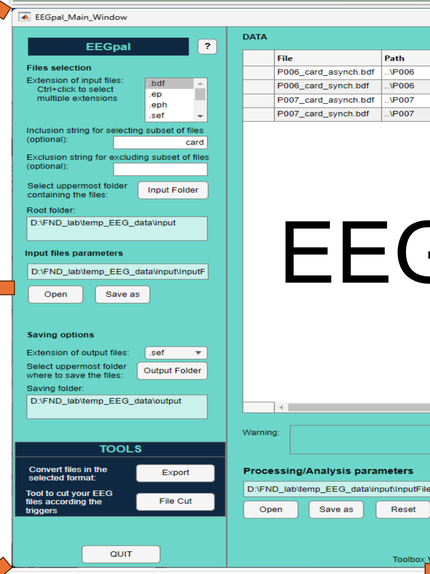
Filtering with Matlab or eeglab function



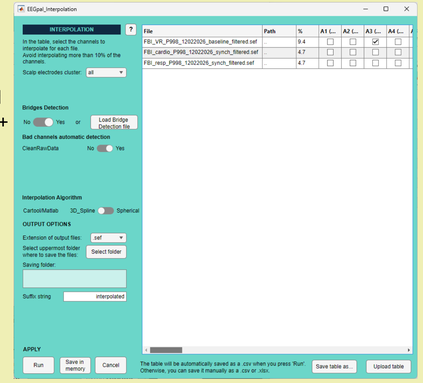
Clean Raw Data toolbox with:
- ASR
- Automatic bad channel suggestion

Resample data

Notch Filter or CleanLine toolbox



Interpolation



Automatic suggestions of bad channels (bridges + Clean Raw Data)

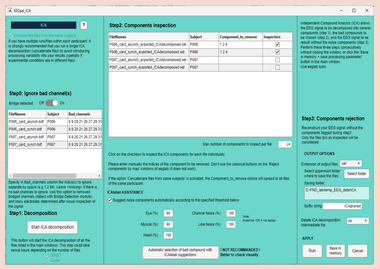
Interpolation with 3D_Spline (Cartool) or Spherical (eeglab) algo

Manual customization of channels selection for interpolation.

Export/Import of interpolation table to work in Excel

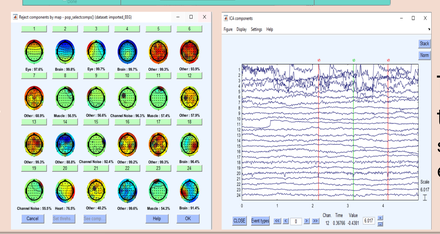
ICA

ICA decomposition ignoring bad channel



Recomposition of the signal without bad components

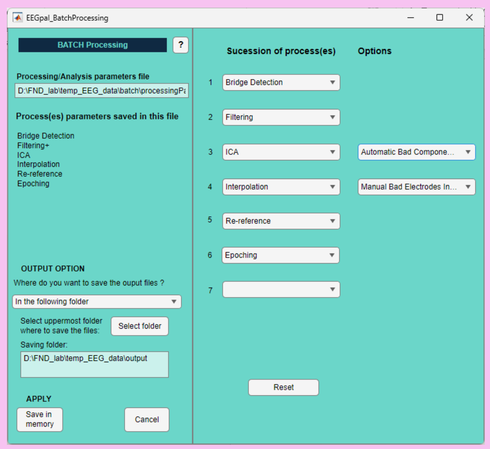
Manual of automatic inspection of components



Use the ICAlabel toolbox to help components recognition

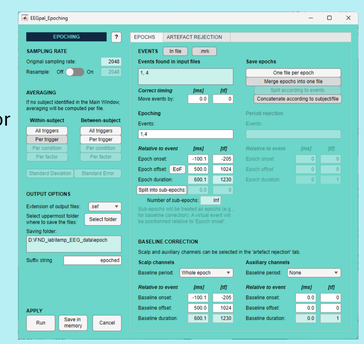
Topography and trace are displayed simultaneously for each component

Batch



Program the sequence of steps to be executed automatically.

Epoching/Averaging



Averaging within or between subject

Automatic Epochs rejection based on :
- Absolute Amplitude
- Step change
- Amplitude range

Save all good epochs into one file or save one file per epoch.

Baseline correction