# EEGpal: **Filtering+ module**

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The 'Filtering+' module can be used to resample the data and filter the unwanted frequency in the EEG signal. The user can choose between two different algorithms to perform this filtering. By default, it uses the Signal Processing Toolbox from Matlab, but it can also call the filtering function used in EEGLAB. In addition, the module can call several EEGLAB tools to clean the data (such as CleanLine, ASR or automatic bad channel detection).

A screenshot of a computer

Description automatically generated

Pannel A

1. You can remove channel from the processing.
2. You can resample your data to another sampling frequency (new frequency must be specified in Hz). This is typically used when you want to downsample your data.

Pannel B

1. Activate of deactivate the filtering (to clean and remove frequency of no interest)
2. Choose between the two modes of filtering:
   1. Matlab mode: It will use the *filtfilt* function include in the Signal Processing toolbox (addone to Matlab)
   2. eeglab mode: It will use the *pop\_eegfiltnew* function include in the eeglab toolbox (include in EEGpal)
3. Parameters of filter depend of the mode:
   1. In Matlab mode, the user can choice between **High+Low pass** which correspond to a passband filter (apply successively a high pass then a low pass),

**Should I use Signal Processing Toolbox (*filtfilt* function) or EEGLAB (*pop\_eegfiltnew* function) to perform my filtering?**

Difficult questions. The results are similar for these two options. The authors found that the quality of the filtfilt Matlab filter was slightly better. However, the EEGLAB filters can be used without the Signal Processing Toolbox license and are more widely cited in the scientific literature.

**Why I can choose the filter order in Matlab mode and not in eeglab mode?**

The two filtering functions use filter order with different scales. To avoid confusion, the authors decided to impose an automatic choice of these values by EEGLAB (default option).

**In Matlab mode, why the option passband has been replaced by High-pass + Low-pass?**

This is a choice of Michael De Pretto after reading of this reference: XXXX. The result is better by applying successively a high pass filter then the low pass filter.

**Why doesn't the toolbox offer the option of DC removal of the baseline shift, which is common in other EEG processing software?**

In standard EEG pre-processing, we recommend always applying a high pass filter to remove low frequency noise such as signal drift and others. The baseline shift due to DC is included in this type of noise (very low frequency). So, DC removal is useless if you apply a high pass filter with a cut-off between 0.3 and 0.5 Hz.