

Data Package Description

This document provides a description of the data package complementary to the paper *"Suppression of overlearning in independent component analysis used for removal of muscular artifacts from electroencephalographic records"*. The data are stored as the following Matlab files

- `eeg_epochs.mat`
- `emg_epochs.mat`
- `eeg_corrupted_by_emg_9_channels.mat`
- `eeg_corrupted_by_emg_111_channels.mat`
- `classification_features.mat`
- `alpha_suppression_psd.mat`

The description of the content of the individual files is provided below. The sampling frequency of all time dependent signals is $f_s = 1024\text{Hz}$.

`eeg_epochs.mat`

This file contains 500 sets of signals $\mathbf{x}_{clean}[n]$ described in section Evaluation of algorithm performance. The signals are organized as a three dimensional array `eeg_epochs`, where the individual channels span the first dimension, the time spans the second dimension and the individual sets span the third dimension.

`emg_epochs.mat`

This file contains 70 sets of signals $\mathbf{x}_{artifact}[n]$ described in section Evaluation of algorithm performance. The signals are organized as a three dimensional array `emg_epochs`, where the individual channels span the first dimension, the time spans the second dimension and the individual sets span the third dimension.

`eeg_corrupted_by_emg_9_channels.mat`

This file contains EEG signals (9 channels) corrupted by EMG artifacts. These signals were presented in Fig. 1.

`eeg_corrupted_by_emg_111_channels.mat`

This file contains EEG signals (111 channels) corrupted by EMG artifacts. These signals were presented in Fig. 2 and were used to generate results in Fig. 7, 8 and 9.

`classification_features.mat`

This file contains power ratios α (19) that were used to estimate the threshold for the EMG artifact classifier (the histogram of this data is shown in Fig. 3). The power ratios for artifact free brain signals are stored in variable `disteeg` and power ratios for EMG artifacts are stored in variable `distemg`.

`alpha_suppression_psd.mat`

This file contains the averaged power spectral densities (PSDs) shown in Fig. 10. The average PSDs computed from the unprocessed data for closed eyes and open eyes conditions are stored in arrays `PSD_eyes_closed_raw` and `PSD_eyes_open_raw`, while the average PSDs computed from the data processed by the proposed algorithm for closed eyes and open eyes conditions are stored in arrays `PSD_eyes_closed_processed` and `PSD_eyes_open_processed`. The corresponding frequency axis is stored in array `f`.