An automatic pre-processing pipeline for EEG analysis (APP) based on robust statistics

Artifacts removing: Independent component analysis (ICA)

Supervised methods, too much time consuming 🡪 Because of high-density EEG arrays (64-256 channels). Greater amount of data.

Automatic methods for artifacts removing:

* Fully automated statistical thresholding for EEG artifact rejection (FASTER)
* Tool for automated processing of EEG data (TAPEEG)
* Robust statistics: Prep pipeline using RANSAC algorithm (random sample consensus)

Here APP: consists of:

* (1) high-pass filtering
* (2) powerline noise removal
* (3) re-referencing to a robust estimate of the mean of all channels
* (4) removal and interpolation of bad channels
* (5) removal of bad epochs
* (6) ICA to remove eye movement muscular and bad-channel related artifacts
* (7) removal of epoch artifacts.

Tested on 61 healthy participants and 44 schizophrenia patients.   
Schizophrenia patients produce more artifacts.