

EEG / ERP signal processing training workshop in EEGLAB toolbox

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The recording and analysis of brain electrical signals (EEG) are used as tools to recognize brain function during neuropsychological tasks, diagnose and treat many neurological diseases and disorders, and for brain-computer interface (BCI) applications. Therefore, these signals and their changes during different conditions are investigated in studies.

So far, several software tools have been developed for analyzing EEG signals. One of the most famous is the EEGLAB toolbox, which integrates with the MATLAB software environment and enables the execution of many important processes in EEG signal analysis. The toolbox has an easy-to-use graphical interface that allows researchers in engineering and non-engineering fields, as well as those who are new to EEG signal analysis, to analyze EEG signals without the need for coding or performing complex operations. In this workshop, participants will learn how to practically use this toolbox. To participate, MATLAB software needs to be installed on your systems (the version is not important). It is recommended to have some knowledge about the MATLAB programming environment and filter concepts, although it is not necessary.

Table of contents

- Introduction: terminologies and main concepts, applications, and EEG noise and artifact
- Introducing the EEGLAB toolbox and how to add it to the MATLAB environment
- Working with pre-processing tools (Filtering, data selection, referencing, resampling, ...)
- Noise reduction using independent component analysis (ICA)
- Event related potential (ERP) extraction
- Study design in EEGLAB

Audience: Engineering students or other researchers who are interested in the fields of computational neuroscience.