Surfing the brainwaves: Workshop on EEG data analysis in linguistics.

Electroencephalography (EEG) is a popular technique that enables to record neuronal activation in real time, with millisecond precision. It has been used effectively to study various aspects of cognition, including language. Despite its widespread use, there exists a certain degree of uncertainty as to how the EEG signal should be analysed. Although there is a number of EEG signal preprocessing steps that are common to different analysis methods, their parameters need to be properly adjusted so as not to affect the signal in an adverse way, resulting in false representation of the brain signal.

In this workshop we will discuss the recommended steps to analyse EEG signal (cf., Keil et al. 2013; Luck and Gaspelin 2017), with a particular focus on analyzing neuronal activity time–locked to the stimuli of interest, i.e., Event–Related Potentials (ERPs). The workshop will cover fundamental steps in EEG analysis such as filtering and re–referencing, as well as more advanced preprocessing and analysis tools, e.g., Independent Component Analysis (ICA; Makeig et al. 1996) or Mass Univariate Analysis (Groppe et al. 2011). Various new standardized methods of EEG data preprocessing will also be briefly discussed (e.g., Bigdely-Shamlo et al. 2015, Gabard-Durnam et al. 2011) along with recently developed tools making certain EEG data analysis steps easier and more effective (e.g., Pion-Tonachini et al. 2019). All theoretical parts of the workshop will be supplemented by demonstration of preprocessing steps and analyses in the EEGlab (Delorme and Makeig, 2004) and ERPlab (Lopez-Calderon and Luck, 2014) toolboxes in Matlab (Mathworks, Inc.).

Requirements:

- prior experience with EEG analysis is not required, but it will be beneficial.
- having Matlab installed on your computer is not required, but it will be beneficial.

References:

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Gabard-Durnam, L. J., Mendez Leal, A. S., Wilkinson, C. L., & Levin, A. R. (2018). The Harvard Automated Processing Pipeline for Electroencephalography (HAPPE): Standardized Processing Software for Developmental and High-Artifact Data. *Frontiers in Neuroscience*, *12*, 97. http://doi.org/10.3389/fnins.2018.00097

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