



Machine Learning methods For Pain Analysis from EEG Recordings

NEW

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In collaboration with the Laboratory of Clinical Neurophysiology, Faculty of Medicine of the Technion

Project description:

Electroencephalogram (EEG) is a typically non-invasive test used to measure the electrical activity of the brain (i.e. neuronal activations), by placing electrodes along the scalp.

Traditional analysis of EEG signals generally focus on measuring the:

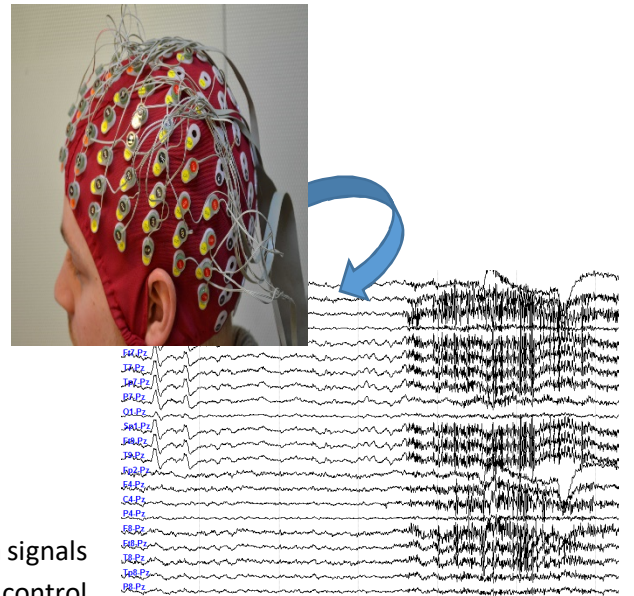
- (i) Magnitudes of neuronal activations within a specific frequency bands.
- (ii) Time of the response to a stimulus (from the averaged signal called ERP).

The goal of this project is to perform automatic analysis of such signals recorded from patients suffering from neuropathic pain and a control group.

In order to do so, we will:

- (i) Use signal processing tools in order to extract from the raw EEG recordings valuable information (called features).
- (ii) Apply a machine learning methodologies on the extracted features to separate between the conditions and extract valuable information regarding the origin of the problem.

The students will get familiar with EEG background and its analysis from signal processing and physiological perspectives and with several Machine Learning methodologies (such as Deep Neural Networks). In order to design a method that is able to classify upon a given EEG reading whether a patient suffers from neuropathic pain.



In pain?

Required background: Signal and systems, Mavlas

Environment: MATLAB (Python also possible)

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