



Comparing complexity measures of resting state EEG between healthy subjects and CLIS patients

Patients with Completely Locked-in Syndrome (CLIS) retain cognitive abilities and are conscious, although it is not noticeable externally. Most research focus on comparing patients with Disorders of Consciousness with healthy subjects and CLIS patients. However, there are close to none research that compare the two latter groups.

The aim of the work is to compare the complexity of electroencephalogram signals (EGG) recorded during resting state between these two groups. The differences, if any, should be quantified by brain regions in order to eventually predict a subject's state using several complexity measures.

Standard signal preprocessing steps such as filtering and segmentation are applied to the data. This will be followed by the computation of the complexity of the signal using different segment lengths and embedding delays. This can be done using geometric phase-space analysis such as Poincaré plots, or quantitative computing using the Lempel-Ziv complexity measure. The task also involve performing classification to predict the group to which a specific subject belongs.

The thesis may be written in English or German.

Requirements:

- Advanced knowledge of signal processing
- Programming in MATLAB and R

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