

MEETING ABSTRACT

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Selective EEG analysis for emotion recognition using multidimensional directed information criteria

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Background

Brain waves captured by multiple electrodes during an electroencephalogram (EEG) recording, are derived as time series signals that represent the brain activity of various scalp sites. One important feature of these multiple time series is the information flow from one to another that under specific processing can reveal useful brain functionality.

Materials and methods

In this work, the Multidimensional Directed Information (MDI) [1] concept is adopted in order to examine the flow of information between EEG recordings from three different scalp sites with the objective to bring out and define the interconnections of different scalp sites of frontal and prefrontal cortex during an emotionally charged situation. In the line of these objectives, EEG signals were recorded from 16 healthy right-handed subjects during a specifically designed emotion elicitation experiment. Two monopole and one dipole EEG channels were placed at Fp1, Fp2 and F3/F4 positions respectively, according to the international 10/20 system [2].

Results

The EEG signals were analyzed using MDI as a parameter that could identify the EEG sections that contribute the most to the emotion recognition. In this way, an efficient emotion categorization could be achieved by keeping the effective parts of the EEG signal and further analyze it feeding a classifier towards the development

of a robust and effective emotion recognition system from EEG recordings.

Conclusions

The encouraging preliminary results justify the feasibility of the proposed approach, stressing the importance of the targeted selection of the information source within the EEG recordings before any further categorization analysis.

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