

Entropy-Based Multichannel Stationary Measure for Characterization of Non-Stationary Patterns

Authors : J. D. Martínez-Vargas, C. Castro-Hoyos, G. Castellanos-Dominguez

Abstract : In this work, we propose a novel approach for measuring the stationarity level of a multichannel time-series. This measure is based on a stationarity definition over time-varying spectrum, and it is aimed to quantify the relation between local stationarity (single-channel) and global dynamic behavior (multichannel dynamics). To assess the proposed approach validity, we use a well known EEG-BCI database, that was constructed for separate between motor/imagery tasks. Thus, based on the statement that imagination of movements implies an increase on the EEG dynamics, we use as discriminant features the proposed measure computed over an estimation of the non-stationary components of input time-series. As measure of separability we use a t-student test, and the obtained results evidence that such measure is able to accurately detect the brain areas projected on the scalp where motor tasks are realized.

Keywords : stationary measure, entropy, sub-space projection, multichannel dynamics

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