

عنوان مقاله:

Epileptic Seizure Prediction Using PDC and GPDC: A Comparison Study

محل انتشار:

ششمیّن کنگره بیّن المللی نقشه برداری مغز ایران (سال: 1398)

تعداد صفحات اصل مقاله: 2

نویسندگان:

Nilufar Totonchi - Department of Biomedical Engineering, Science and Research Branch Islamic Azad University, Tehran, Iran

Ali Motie Nasrabadi - Department of Biomedical Engineering, Shahed University, Tehran, Iran

خلاصه مقاله:

Nowadays, a diverse range of methods have been developed to estimate the effective connectivity (EC) of brain activities that improve the therapeutic procedures of neurological diseases. Hence, selecting the optimal method amongst all of them derived from the coefficients and error terms of autoregressive (MVAR) models has become a popular and vital topic. In this paper, two of the most commonly used techniques for calculating EC, namely partial directed coherence (PDC) and generalized partial directed coherence (GPDC) have been compared through the prediction of epileptic seizures. Method To compare GPDC and PDC measures, we estimated dynamic information derived from changing of EC patterns around seizures by GPDC and PDC measures and then considered them as a feature. The detected information of EC patterns were calculated by the EEGLAB Toolbox in 8 frequency sub-bands [1]. They were extracted from Freiburg iEEG dataset which was recorded in 6 channels for 21 epileptic patients [2]. After extracting features, thresholding step was performed on features to predict correct seizures; Thus, the epileptic seizures were predicted for all patients with GPDC and PDC measures in 8 frequency sub-bands [1] on a Receiver Operating Characteristic (ROC) curves (created by plotting sensitivity versus the false positive rate (FPR) at various threshold settings). In the end, we compared GPDC with PDC measures by using the amounts of area under the curve (AUC) in 8 frequency sub-bands.Results The AUC amount of GPDC measure are obtained more than AUC amount of GPDC measure in all frequency sub-bands except low and high gamma. Conclusions Our findings demonstrate that GPDC measure due to be the scale invariance version of the classical PDC and immune to static gain can have a better epileptic seizure prediction compared with PDC measure in all frequency sub-bands except .[gamma [3

کلمات کلیدی:

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