AUTOREGRESSIVE MODELLING OF PSEUDO-PERIODIC VISUAL EVOKED POTENTIAL SIGNALS FOR CLASSIFICATION OF ALCOHOLICS

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ABSTRACT

In this paper, our objective is threefold. First, we confirm the fact that the gamma band spectrum in the range of 30 to 50 Hz is associated with the visual evoked response elicited during presentation of pictures from the Snodgrass and Vanderwart (SV) standardised picture set. Second, we show that these Visual Evoked Potential (VEP) signals can be modelled optimally for spectral analysis using a second order autoregressive (AR) process since our observations show that the gamma band VEP exhibits pseudo-periodic behaviour. Third, we apply this technique to single trial VEP for discriminating alcoholics from normal subjects. A Fuzzy ARTMAP (FA) classifier with fast learning and voting strategy is used for this purpose. Maximum classification of 95.25% is obtained when experimented with 800 one-second VEP patterns from 10 alcoholics and 10 normal subjects.