Frequency Recognition Models for Steady State Visual Evoked Potential Based Brain Computer Interfaces (BCIs)

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Abstract : SSVEP based brain computer interface (BCI) systems have been preferred, because of high information transfer rate (ITR) and practical use. ITR is the parameter of BCI overall performance. For high ITR value, one of specification BCI system is that has high accuracy. In this study, we investigated to recognize SSVEP with shorter time and lower error rate. In the experiment, there were 8 flickers on light crystal display (LCD). Participants gazed to flicker which had 12 Hz frequency and 50% duty cycle ratio on the LCD during 10 seconds. During the experiment, EEG signals were acquired via EEG device. The EEG data was filtered in preprocessing session. After that Canonical Correlation Analysis (CCA), Multiset CCA (MsetCCA), phase constrained CCA (PCCA), and Multiway CCA (MwayCCA) methods were applied on data. The highest average accuracy value was reached when MsetCCA was applied.

Keywords : brain computer interface, canonical correlation analysis, human computer interaction, SSVEP

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