

A performance comparison between conventional SSVEP and Emokey based Emotiv EPOC matrix speller

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Abstract: EEG based Brain Computer Interfaces have been explored extensively to improve the performance. For any SSVEP (steady-state visual evoked potential) based BCI system costs a lot and which can be considered as one of the main reason for not spreading this spellers all around the world for clinical and commercial uses. Nowadays, Emotiv EPOC is providing a quality service to overcome this problem. In this study, it is shown that the Emokey based Emotiv EPOC matrix speller can give an improved performance in using conventional BCI systems. Emokey is a feature added by the Emotiv device providers for easy development of input key as different emotional states. For this purpose, Bengali matrix speller based on single Emokey has designed for the first time and compared with the standard SSVEP based Latin matrix speller. The performance was remarkable. In the experiment, Emokay based Bengali matrix speller's ITR (Information Transfer Rate) was average 29.4 bits/min and 7.43 Char/min achieved for participants. It is also focused in this study that new designed matrix speller interface can be much friendly for using in daily life text writing, internet searching or social site's integration. It is expected that it will open new enhancement and development chances for BCI users and at the same time for the future researchers.