**BRAIN COMPUTER INTERFACE FOR LEARNING ASSISTANCE**

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**ABSTRACT:**

Brain-computer interface (BCI) technology has the potential to improve learning efficiency by detecting and tracking the attention level of learners. The P300 waveform, a well-known event-related potential, is often used in BCI research for attention detection. In this paper, we propose a BCI system for improving learning efficiency by detecting the attention level of learners using the P300 waveform.

The proposed system uses an online dataset of oddball paradigm to acquire EEG data from participants while they perform attention-related tasks. The data is pre-processed to remove noise and artifacts, and the P300 waveform is extracted by averaging the EEG data over all the target trials. A machine learning model, such as logistic regression and CNN is trained on the extracted P300 waveform to classify the attention level of the participant. The system was evaluated using appropriate evaluation metrics, such as accuracy, and considering the specific use-case for which the BCI is developed. The results showed that the proposed BCI system can effectively detect the attention level of learners with high accuracy.

**Keywords: B**rain **C**omputer **I**nterface, **E**lectro**e**ncephalo**g**ram, **ERP**, **P300**, **M**achine **L**earning, **L**ogistic **R**egression, **C**onvolution **N**eural **N**etwork

**Guide Signature**