고려대학교 KOREA UNIVERSITY 뇌공학과

BK21 플러스

Distinguished Lecture Series

A Cognitive Brain-Computer Interface and Its Clinical Applications

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소속: Nanyang Technological University

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Abstract

In a typical scenario, Brain-Computer Interfaces (BCIs) translate neural recordings (from electroencephalogram, fMRI, fNIRS) into specific brain states (motor, cognition, emotion, ERP, etc), construct a command or representing score, and feedback to the user in the form of visual, auditory, haptic or electrical stimulus. Cognitive BCI is one of them, which emerges as a promising paradigm in treating or enhancing cognitive capacities in people with cognitive deficits (for example, children with ADHD and elderly with cognitive decline). In this talk, we first present a new cognitive BCI with the inter-subject transfer learning strategy based on an end-to-end deep convolutional neural network (DCNN), which is used to predict attention levels in real-time. A new discriminative ocular artifact correction approach for feature learning in single-channel EEG is also discussed. Then, we will report the results of two large scale clinical trials in children with ADHD (N=172) and elderly with cognitive decline (N=224). Finally, we will present neuroimaging findings from the clinical studies, which indicate the neuroplasticity effects of the BCI based cognitive training.

주최: 고려대학교 BK21플러스 뇌공학글로벌인재양성사업단

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