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강연 제목: tCS 를 이용한 뇌신호 & 신경재활

Brain Signal & Neuro-Rehabilitation using Transcranial Current Stimulation

Abstract:

Neuromodulation using tCS refers to changing nerve activity by delivering electrical stimulation to specific areas in the brain. It is a state-of-the-art treatment that aims to improve or modulate the function of the nervous system. Neuromodulation involves various electromagnetic stimuli, such as drugs injected with electric current directly into the subdural area. Electric current based neuromodulation can affect neuronal populations by releasing transporters such as dopamine or other chemical messengers, such as peptide substance P, which modulate excitability and firing. By stimulating nerve cell activity, it uses the body's natural biological signal (such as EEG/fNIRS) or response. Patterns of electrical interactions with neural elements may have more direct electrophysiological effects on the neural membrane as a mechanism of action. Although the exact mechanism of nerve stimulation is unknown, significant clinical applications have been made due to its empirical research. To date, existing neuromodulation therapies have been used to treat drug-resistant epilepsy, chronic headache conditions, and functional disorders, such as bladder and bowel or respiratory control, as well as improving sensory disorders, such as hearing. Technological advancements have led to a trend towards minimally invasive systems, smaller, wearable and more sophisticated devices capable of closed-loop feedback control and compatible with magnetic resonance imaging. Neuromodulation therapy has been reported as an adjuvant treatment for stroke recovery and other chronic diseases, such as Alzheimer's disease, depression, and chronic jaundice. In this presentation, we introduce the latest neuromodulation equipment being developed in Korea, the research on tCS stimulation in the form of a closed loop, and biosignals, such as EEG and fNIRS.

Brief Biosketch

Research Professor, Hanyang University (2011~2012)

Research Association(Post-doc), Dept. BME, Florida International University (FIU) (2013~2015)

Associate Professor & Director, College of Nursing and HealthScience in FIU (2013~2015)

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