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강연제목: 실시간 뇌-기계 인터페이스를 통한 신경 조절 기술 개발 (Building an Efficient Communication Algorithm Utilizing Real-Time Single-Unit BMI)

Abstract: For efficient communication with the brain, real-time processing of neural signals is critical. Recent advances in neuroscience, machine learning, and technology have improved the speed and accuracy of brain-machine interface (BMI) communication. However, many approaches are rate based, rather than fully utilizing the temporal code of individual neural spikes. In this study, we utilized a Field Programmable Gate Array (FPGA) chip to build a high-channel count and low latency BMI system. Our system achieves a 1 ms latency from spike detection, data processing, spike assignment, to feedback signals. This system enabled us to modify the information exchange between brain regions by inactivating the downstream region even before the signal from the upstream region arrives. Also, this tool has the potential to connect two initially disconnected brain regions. In this presentation, I will describe further possibilities that can be explored using the real-time BMI system.

Brief Biosketch

2002-2008 M.D., College of Medicine, Seoul National University, Korea
2009-2013 Residency, Neurology, Seoul National University Hospital, Korea
2011-2013 M.S., College of Medicine, Seoul National University, Korea
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