

A Sensing Mechanism for Brain-Machine Interface

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I have been collaborating with medical doctors and physical / occupational therapists in Keio University Rehabilitation Center and University Hospital in order to develop new types of Man-Machine Interfaces. So far I develop a three-dimension pointing device using an array of conductivity sensors as an assistive tool for the physically challenged.

My major is both Rehabilitation Engineering and Neuroscience, and I currently focus on an ultimate interface named Brain-Machine Interface. Brain-Machine Interface is, as its name stands, a way to control machinery directly in accordance with one's brain activity. For developing this technology, a higher-order spectrum analysis quantifying a characteristic change of a brain wave (that is electrical potential named Electroencephalogram, EEG) was originally developed in order to decode one's motor intention. An optimized spatial filter, consisted of an array of sensors placed on the surface of one's head, was also designed for this signal processing. In JAFoE, I will talk about such a originally developed sensing technique for Brain-Machine Interface, based on physiological evidences.