ICAS Internal Seminar

Towards a Miniaturized Brain-Machine-Spinal Cord Interface (BMSI) for Restoration of Function after Spinal Cord Injury

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Abstract:

Nowadays Brain-Machine Interface (BMI) technology is designed to either record from the brain and use the recorded neural activity as the source of command for controlling the external environment , or stimulate the brain (or other parts of the nervous system) to modulate a dysfunctional neural pathway or transmit a particular type of sensory information. While the existing BMI technology has shown a tremendous potential for augmenting the quality of life in patients afflicted with neural injuries and neurological disorders, a new generation of neuroprostheses is already emerging that aims to combine neural recording, neural signal processing and microstimulation functions in a single device for closed-loop operation. These neuroprosthetic devices create an artificial connection in the nervous system by converting neural activity recorded from one cortical area to electrical stimuli delivered to another cortical area or muscles in real time, and have been shown to induce neuronal plasticity for functional reorganization in both intact and injured nervous systems.

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