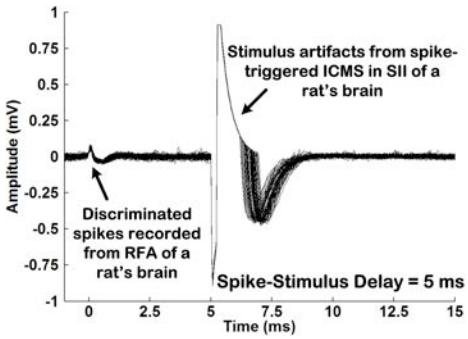
Neuroengineering Seminar

A Miniaturized Brain-Machine-Brain Interface for Restoration of Function after Brain Injury



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Monday, November 4, 2013
4:00-5:00pm
Fung Auditorium, Powell-Focht Bioengineering Building
University of California San Diego

Abstract: To date, brain-machine interfaces (BMIs) have sought to interface the brain with the external world using intrinsic neuronal signals as input commands for controlling external devices, or device-generated electrical signals to mimic sensory inputs to the nervous system. A new generation of neuroprostheses is now emerging that aims to combine neural recording, signal processing, and microstimulation functionalities for closed-loop operation. These devices might use information extracted from the brain neural activity to trigger microstimulation or modulate stimulus parameters in real time, potentially enhancing the clinical efficacy of neuromodulation in alleviating pathologic symptoms or restoring lost sensory and motor functions in the disabled. This seminar will present a miniaturized system for spike-triggered intracortical microstimulation (ICMS) as a novel, device-based approach for improving functional recovery after traumatic brain injury (TBI). Our current findings from experiments with ambulatory, brain-injured rats using a battery-powered, head-mounted microdevice will be presented. This work has the potential to remarkably advance the neurorehabilitation field at the level of functional neurons and networks.

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