Neural Prosthesis Seminar

November 21, 2008

8:30 AM to 9:30 AM

Wolstein Auditorium
2103 Cornell Avenue

"Toward High-Performance Cortically-Controlled Prostheses"

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Abstract: Our seemingly effortless ability to reach out and swat a fly or grab a cup belies the sophisticated neural computations at work in our nervous system. It has long been recognized that, before moving, we somehow prepare neural activity such that, when called upon, the desired movement unfolds. But the goals of movement preparation and the underlying neural mechanisms remain poorly understood. I will describe some of our recent electrophysiological investigations of how premotor cortex prepares movements. With this increased understanding of movement planning, it becomes possible to design real-time implantable electronic systems capable of translating neural plans into prosthetic-arm or computer-cursor movements. I will describe our recent electrophysiological investigations aimed at establishing the fundamental, neurobiologically dictated performance limits as well as recent algorithmic and circuit research aimed atachieving these performance limits. Our results suggest that swift and accurate performance is possible, which is essential for starting to assess the clinical viability of cortically-controlled prosthetic systems.

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