

September 13, 2007

**Bidirectional neural interfaces and
neural prostheses**

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ABSTRACT OF THE TALK

In the recent past, implantable neural interfaces have been used to gather important information about the functioning of the central and peripheral nervous systems. There are also increasing evidences that they can be used to develop different classes of neural prostheses to restore sensorimotor function in people who lost them for neurological disorders and disabilities and for traumatic events such as amputation. Therefore, neural implants could have significant potential to enhance our understanding of normal and pathological states of the brain, and at the same time significantly impact the design and use of neural prosthetic devices.

The aim of this presentation is to provide information about leading research activities carried out by several groups around the world working to develop more effective neural interfaces and neural prostheses.

In particular, the following topics will be covered: (1) neural interfaces as enabling technologies; (2) decoding algorithms; (3) shared control between the user and the artificial device via interfaces and decoding algorithms; (4) methods and devices for sensory feedback. Particular attention will be also devoted to the possible clinical applications of this kind of technology.