

## **Neuroengineering of Nerve Interface for Functional Restoration and Neuroprosthesis**

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### **Abstract:**

A great deal of attention has gone into developing cortical neural interface for various applications, ranging from neural recording and stimulation for basic science discovery work as well as diagnosis and treatment of different cortical disorders and for neuroprosthesis applications. Recently, interface to nerves has received renewed attention to treat restoration of nerve injury associated limb function as well as for treatment of various neurological disorders treatable by recording and functional stimulation of visceral nerves. This talk will first review the basic science of nerve injury, axonal repair and regeneration. Next, the state of the art of key technological ingredients, including microelectrodes for nerve interface, microelectronics for recording, stimulation and data/power transfer, and decoding of nerve signals for functional restoration will be summarized. Finally, experimental results in animal models and translational clinical applications will be reviewed.