Titolo (provvisorio): Reshaping Perception and Action in EMG based Human-Machine Interfaces

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Motivazione e campo di applicazione

Body-machine interfaces (BMIs) decode upper-body motion for operating devices, such as computers and wheelchairs. In the last decades, body machine interfaces have been developed as a tool to investigate neural control of movement and/or to empower disabled people to reach assistive and rehabilitative goals. BMI based on body movement have been proved effective to support personalized therapy for survivors of cervical spinal cord injury (cSCI).

Obiettivi generali e principali attività

Aim 1: Developing the technology for a hybrid human-machine interface based on mapping body motion sensors and EMG signals onto a variety of control tasks. We will manipulate the sensory feedback (visual) to induce desired changes in the muscle and motion patterns of healthy and spinal cord injured subjects.

Aim 2: Assessing the activation and/or deactivation of targeted muscles and muscle synergies through a movement and EMG analyses.

Obiettivi di apprendimento (strumenti tecnici e analitici, metodologie sperimentali)

The student will learn:
- To analyze and correlate body signals from different sources such as movement and EMG
- To develop the control of an external device based on body signal coming from different sources
- To develop data analysis tools for behavioral data
- To improve the knowledge of Matlab/Simulink, C Sharp, autoencoders networks and statistical analysis
- To work (in an international team) with people with different backgrounds and with people with disability

Luogo/i in cui si svolgerà il lavoro: Santa Corona Hospital in Pietra Ligure (SV) – Italy / Spinal Department

Numero massimo di studenti: 1