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

Relatore/i: Casadio Maura, Antonino Massone, FA Mussa-Ivaldi

E-mail: Maura.Casadio@unige.it

Indirizzo: Via Opera Pia 13, 16145 Genova (ITALY)

Tel.: (+39) 010353 - 2749

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 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 a 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