**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).

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**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.

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**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.

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**Luogo/i in cui si svolgerà il lavoro:**

Santa Corona Hospital in Pietra Ligure (SV) – Italy / Spinal Department

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**Informazioni aggiuntive**

**Numero massimo di studenti:** 1