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Conferenza

Internal model of gravity force: Action and Perception mechanisms

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Motricité- Plasticité: Performance, Dysfonctionnement, Vieillesse et Technologies d'optimisation.

Fac. des Sciences du Sport

Dijon

France

The talk will be separated in 3 parts.

In the first part I will give an overview of the lab INSERM ERM 207 (see our website : <http://www.u-bourgogne.fr/ERM207> <<http://www.u-bourgogne.fr/ERM207>>).

In a second part I will present my scientific activities. Our work consists to better understand the content of motor commands when performing 3D arm or whole-body movements, and more specifically the internal model of gravity force. The plasticity of the sensorimotor mechanisms is studied after intrinsic (hypoactivity, aging, central lesions...) or extrinsic (hypo or hypergravity) changes. We found an asymmetry in kinematics features of both arm and whole-body movements performed in the sagittal plane, indicating a differentiate control of movement with and against gravity. A new model in progress reproduces pretty well the recorded kinematics of arm movements in the sagittal plan in contrast to the classical optimization functions. Concerning whole-body movements we try to discover the rules that coordinate posture and movement. Hence when a person is asked to reach a target located beyond the limits of his/her reaching arm from a standing position, the brain has to fulfill two different goals: a) to produce the required hand trajectory toward the target, and b) to maintain the whole body's center of mass (CM) within the supporting foot area. All these questions are studied by considering both action and perception processes.

The third part of the talk will be dedicated to applied research and technical developments based on our results (i.e., motor rehabilitation through virtual reality and motion observation ...).