**Abstract @WALK**
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The associated team @WALK (ArTificial WALKing) aims at developing new tools for modeling and control of human sensory motor system. @WALK is the collaboration activity between the project team DEMAR (leader: Dr. D.Guiraud, INRIA Sophia Antipolis Méditerranée) and the Stanford Robotics team (Artificial Intelligence laboratory, Stanford University) leaded by Pr. O. Khatib. In this collaboration we are focusing our effort on two directions. On one hand, we contributed to develop and implement a FES muscle model in OpenSim (Simulation Toolkit, Stanford) as well as the study and modeling of human motion in the Sit-To-Stand protocol (STS) dedicated to paraplegics and elderly population. On the other hand, we are involved in the development and assessment of new approach based on constraint-consistent analysis of muscle force contributions to human gait. The objective is to characterize the muscle force contributions to the body center of mass during human gait taking into account the contacts with the environment as well as the constraints in the musculoskeletal system. This approach should be very promising for analyzing movement on post-stroke patients and paraplegics under FES.