

Vendredi 20 novembre 2009 à 14 h 00

Université Paul Sabatier – Bât. U4, salle 208 – Toulouse

Conférence

Katja MOMBAUR

LAAS - CNRS

« OPTIMISATION DU MOUVEMENT – APPLICATION A LA MARCHÉ ET A LA COURSE »

Abstract :

The model-based investigation of human and human-like motions is an important interdisciplinary research topic which involves aspects of Biomechanics, Physiology, Orthopedics, Psychology, Neurosciences, Robotics, Sport, Computer Graphics and Applied Mathematics. In this context, the study of basic locomotion forms such as walking and running is of particular interest due to the high demand on dynamic coordination, actuator efficiency and balance control. Mathematical models and numerical optimization techniques can help to better understand the basic underlying mechanisms of these motions and to improve them.

In this talk, we present different studies of dynamic human motions which show how optimisation can help to generate very natural looking motions. We use multibody dynamics models of the human body with ca. 30 degrees of freedom with realistic descriptions of ground impacts and state-of-the-art efficient optimisation techniques. We not only study walking and running, but also some more artistic forms of locomotion. We show in particular how optimisation can lead to improved stability properties of the dynamic systems.

In addition, we present the Inverse Optimal Control approach, which serves to identify objective functions of human motion from motion capture measurements.

Pour toute information sur la conférence, contacter V. Kostubiec (kostubri@cict.fr).

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