



**4th IFAC Workshop on
Lagrangian and Hamiltonian Methods for Nonlinear Control
LHMNIC 2012
29-31 August 2012**

First Announcement and Call for Papers

Organized by: DEIS, Dipartimento Elettronica Informatica Sistemistica, Università di Bologna, Italy

Sponsored by: IFAC International Federation of Automatic Control, IFAC TC on Non Linear Control Systems

Co-sponsored by: IFAC TC on Distributed Parameters Systems, IFAC TC on Control Design

Scope

New technologies have created engineering problems where successful controller designs must account for nonlinear effects, and existing theories for general nonlinear systems often prove to be insufficient. Moreover, most of the existing nonlinear control design methods do not take into account the physical properties of the system and tend to compensate for any nonlinear effect; thus creating unnecessary control actions and potential fragility. Furthermore, it has been recognized that nonlinearities are not necessarily a drawback and may even be beneficial. Starting from these observations new approaches to nonlinear control that exploit the structure and the properties of mechanical and electromechanical systems, in particular the Lagrangian and Hamiltonian structures, have been discussed in the literature in recent years by a growing number of international experts. This also takes into account the important roles played by Hamiltonian and Lagrangian methods in various scientific disciplines ranging such as classical mechanics, quantum mechanics, fluid dynamics, electrodynamics, irreversible thermodynamics, mass and heat transport systems, celestial mechanics, optimal control theory, and dynamical systems theory.

Following these considerations, the goals of the fourth IFAC Workshop on Lagrangian and Hamiltonian Methods for Nonlinear Control are to highlight new modeling and control problems, to bring together control experts from different areas, and to present state-of-the-art results on the analysis and control of complex dynamical engineering systems: in brief, the important role of Lagrangian and Hamiltonian structures as design methods will be investigated.

Topics

This workshop will cover new developments in nonlinear control theory, design methods and applications where techniques have been effectively tailored to exploit the mechanical and electromechanical system structure. In-depth discussions by all participants on basic problems and future directions will be encouraged.

Location

The workshop will be held at the Residential Center of the University of Bologna located in Bertinoro (FC), a medieval village on the hills facing the Adriatic coast and renowned for the hospitality, the good food and the excellent wine. The Center is a complex of three large historical and monumental buildings, forming a unique block on the top of the ancient town, in a quiet and hospitable place, surrounded by a very pleasant and peaceful atmosphere. For more details, visit <http://www.ceub.it/>.

Important dates

Submission of draft papers: April 1, 2012

Author notification: May 15, 2012

Final paper: June 15, 2012

For more information: <http://www.lhmnic12.deis.unibo.it/>

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