Preface

This book contains the contributions presented during the *Workshop on Multibody System Dynamics, Robotics and Control*, which took place at the Johannes Kepler University of Linz, Austria, in September 2011. The workshop aimed at bringing together international scientists with an outstanding expertise in mechanics and control, with emphasis on the application to advanced machines and robotic systems. The international character of the workshop was deepened by the participation of widely renowned scientists from Europe. The workshop continued a series of international workshops, which started with the *Japan-Austria Joint Workshop on Mechanics and Model Based Control of Smart Materials and Structures* in September 2008 and the *Russia-Austria Joint Workshop on Advanced Dynamics and Model Based Control of Structures and Machines* in April 2010; both took place in Linz, Austria.

This series of workshops is organized within the framework of the Area *Mechanics and Model Based Control* of the *Austrian Center of Competence in Mechatronics (ACCM)*. This peer-reviewed center of competence served as the steering organisation for the workshop series. Mechanics and Model Based Control are rapidly expanding scientific fields and fundamental disciplines of engineering, particularly in Mechatronics. They share demanding mathematical and/or system-theoretic formulations and methods. One challenge in Mechanics and Model Based Control is to use the ever-increasing computer power with respect to both the simulation of complex physical phenomena in mechanics and the design and real-time implementation of novel control systems. From a strategic point of view, the key objectives of the workshop series are:

- Enabling the interchange of ideas from multibody system dynamics, robotics and control
- Clarification of expectations of researchers in the field of mechanics from advanced control theory and vice versa
- Development of joint international research proposals and teams
- Encouragement of collaborations among industry and universities across the borders of the participating countries

The main topics of the present *Workshop on Multibody System Dynamics, Robotics and Control* were:

- Time/energy optimal path planning for robotic systems
- Optimization in multibody dynamics
- Novel control concepts for flexible multibody systems and robots
- Humanoid robots
- Mobile robots
- Wire robots
- Vibration control for flexible robots
- Control in biomechanics

We believe that the workshop will finally result into the creation of research teams within europe. Such teams should push the frontiers of advanced dynamics and model-based control of machines and robotic systems to new dimensions, resulting in the advanced design of future applications.

The undersigned editors of the present book entitled *Multibody System Dynamics, Robotics and Control* are happy to present the following 17 full-length papers. It is hoped that these contributions will further stimulate the international research and cooperation in the field. The present book is aimed as a third volume of a future *Series in Research on Advanced Methods of Mechatronics*.

March 2012

Hubert Gattringer
Johannes Gerstmayr

http://www.springer.com/978-3-7091-1288-5

Multibody System Dynamics, Robotics and Control
Gattringer, H.; Gerstmayr, J. (Eds.)
2013, X, 314 p., Hardcover
ISBN: 978-3-7091-1288-5