

Preface

Multibody Dynamics is an exciting area of applied and computational mechanics, whose substantial progress during the last five decades has stemmed from the rapid and simultaneous development of many technological disciplines like robotics, spacecraft and machine design, and was stimulated by the advances in computational techniques. In order to deliver methods and tools for the modeling, analysis and simulation of complex mechanical systems, various topics were merged in the field, including contact and impact, control and mechatronics, real-time simulation, optimization, flexibility, time integration schemes and software development. The current area of interest include robotics and walking machines, road and railway vehicle dynamics, aerospace, biomechanics, and many other multidisciplinary applications.

The ECCOMAS Thematic Conference on Multibody Dynamics was initiated in Lisbon in 2003, and then continued in Madrid (2005) and Milan (2007), aimed at providing a venue for exchanging ideas and recent developments related to the theory and applications of multibody systems. The fourth edition of the Conference was held at the Warsaw University of Technology, Warsaw, Poland, from June 29 to July 2, 2009. At the Conference participated 219 researches from 27 countries, mainly from Europe (162), but also from Asia (40), and North (13) and South America (4). They presented 167 technical papers, having an excellent forum for discussion and technical exchange on the most recent advances in the rapidly growing field of Multibody Dynamics.

The present book is a collection of revised and extended versions of 15 papers presented at the Conference, recommended by the Session Organizers for publication in this post-conference book. The general selection criterion was that the papers best reflect the state-of-art of the topics associated to the particular sessions, and cover the areas of biomechanics (Raison et al.), contact dynamics (Flores et al./Ziegler and Eberhard), control, mechatronics and robotics (Iwamura et al./Seifried), efficient methods and real-time applications (Cavagna et al./Pfau and Schaden), flexible multibody dynamics (Ambrósio et al./Dibold and Gerstmayr), formulations and numerical methods (García Orden and Aguilera/Schindler et al.), miscellaneous multibody applications (Frączek and Wojtyra), optimization

(Brüls et al.), software development, validation, and education (Tasora et al.), and vehicle systems (Bottasso et al.). We hope you will find the reading of this collection enjoyable and stimulating.

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