

Preface

The present book presents up-to-date contributions in the field of mechanisms, mechanical transmissions, robotics and mechatronics. The following topics are covered: kinematics, dynamics, analysis and synthesis, mechanical design, sensors and actuators, intelligent control systems and the related applications in planar and spatial mechanisms and mechanical transmissions, biomechanics, serial and parallel robots, mobile robots, teleoperation, haptics, virtual reality, precision mechanics. The results reported in this book should interest researches, scientists, industrial experts, teachers and students in the fields of engineering related to design, control and applications.

The authors discussed their results at MTM & Robotics 2012 - *The Joint International Conference of the XI International Conference on Mechanisms and Mechanical Transmissions (MTM) and the International Conference on Robotics (Robotics'12) held in Clermont-Ferrand, France, on June 6-8, 2012*. The contributions had been rigorously reviewed and selected by independent reviewers, members of the Advisory Board and the International Scientific Committee of this joint conference. MTM & Robotics 2012 was organized by Pascal Institute (CNRS, IFMA, UBP) in collaboration with the Department of Mechatronics (UPT) at the French Institute for Advanced Mechanics (IFMA) under the patronage of the International Federation for the Promotion of Mechanism and Machine Science (IFToMM) and the Robotics Society of Romania (RSR) with the support of Blaise Pascal University (UBP), Centre National de la Recherche Scientifique (CNRS), French Institute for Advanced Mechanics and “Politehnica” University of Timisoara (UPT).

The previous editions of the two conferences were held in Romania, beginning in 1972 under the patronage of IFToMM and RSR. The organization of this joint conference in Clermont-Ferrand at IFMA in 2012 is part of a series of scientific and cultural events celebrating the 20 years of IFMA.

We are grateful to the authors for their valuable contributions and to the reviewers for their timely reviews and recommendations as improvement guidance for the selected papers. Our special thanks go to IFToMM (TC Linkages and Mechanical Control – former Mechanical Transmissions, TC Robotics and Mechatronics and TC Computational Kinematics) and RSR for the scientific patronage of this joint conference, as well as to the conference sponsors – UBP, IFMA and Pascal Institute. We thank also the members of Organizing Committee for the enthusiastic work of organizing this joint conference and the publisher Trans Tech Publications, who paved the way to the timely publication of this book with their excellent technical and editorial support.

G. Gogu, I. Maniu, E-C. Lovasz, J-C. Fauroux, V. Ciupe, editors

Committees

General Chair

Grigore Gogu (France)

Co-Chairs

Inocentiu Maniu (Romania)

Erwin-Christian Lovasz (Romania)

Advisory Board

Marco Ceccarelli (Italy)

I-Ming Chen (Singapore)

Burkhard Corves (Germany)

Mircea Ivanescu (Romania)

Jean-Pierre Merlet (France)

Doina Pislă (Romania)

Ion Visa (Romania)

International Scientific Committee

Mario Acevedo (Mexico)

Nicolae Alexandrescu (Romania)

Oscar Altuzarra (Spain)

Jorge Angeles (Canada)

Virgil Atanasiu (Romania)

Michel Berducat (France)

Philippe Bidaud (France)

Ilian Bonev (Canada)

Theodor Borangiu (Romania)

Stelian Brad (Romania)

Cornel Brisan (Romania)

Valentin Ciupe (Romania)

Marc Dahan (France)

Jian Dai (U.K.)

Michel Dhome (France)

Valer Dolga (Romania)

Ioan Doroftei (Romania)

Jean-Christophe Fauroux (France)

Alexander Golovin (Russia)

Antoni Gronowicz (Poland)

Tian Huang (China)

Emmanuel Hugo (France)

Manfred Husty (Austria)

Nicolae Joni (Romania)

Sukhan Lee (South Korea)

Philippe Martinet (France)

Vistrian Maties (Romania)

J. Michael McCarthy (USA)

Karl-Heinz Modler (Germany)

Gheorghe Mogan (Romania)

Mircea Neagoe (Romania)

Mircea Nitulescu (Romania)

Vincenzo Parenti Castelli (Italy)
Nenad Pavlovic (Serbia)
Dan Perju (Romania)
François Pierrot (France)
Pascal Ray (France)
Didier Remond (France)
James Ritchie (U.K.)
Lin Song (China)
Ionel Staretu (Romania)
Yukio Takeda (Japan)
Doru Talaba (Romania)
Ion Vela (Romania)
Philippe Wenger (France)
Ligang Yao (China)
Saïd Zegloul (France)

Organising Committee

Jean-Christophe Fauroux-Chair (France)
Valentin Ciupe-Co-Chair (Romania)
Veronica Argesanu (Romania)
Nicolas Blanchard (France)
Nicolas Bouton (France)
Chedli B. Bouzgarrou (France)
Olivier Bullat (France)
Iosif Carabas (Romania)
Hélène Chanal (France)
Frédéric Chapelle (France)
Arjana Davidescu (Romania)
Isabelle Duteil (France)
Vincent Gagnol (France)
Jacqueline Gorse (France)
Sanda Grigorescu (Romania)
Anne-Lise Gros (France)
Voicu Mesaros-Anghel (Romania)
Cristian Moldovan (Romania)
Arlette Naudet (France)
Laurent Sabourin (France)
Carmen Sticlaru (Romania)
Valeria Vacarescu (Romania)