

## PREFACE

The present volume is a Special Issue on Optimization and Differential Equations. There is no need to describe each paper included in the special issue nor to list the diversity of the corresponding research areas while leaving to the reader the pleasure to enjoy new trends and results. Let us rather mention that this issue of Discrete and Continuous Dynamical Systems–Series S, is an outgrowth of the IMAME 2016 conference, “The International Meeting on Applied Mathematics in Errachidia 2016”, which was held at the Moulay Ismail University, Faculty of Sciences and Technics of Errachidia, Morocco, May 9–12, 2016.

The aim of the IMAME conferences is to bring researchers and professionals to discuss recent developments in both theoretical and applied mathematics, to create a knowledge exchange platform between mathematicians. The conference is broad-based, covering all branches of engineering sciences, mathematics and interdisciplinary researches. The same spirit of openness and cooperation prevailed in the construction of the present volume. Although all the papers in this issue are devoted to recent advances in the study of differential equations, their collection provides a broad range of nonlinear systems and analysis, as well as various applications, contributing especially to the theoretical, asymptotic and numerical analysis of partial and fractional differential equations.

This issue is also aimed at celebrating the collaborative research in applied mathematics initiated by the mathematicians of the FST Errachidia. Let us mention the works with the Systems and Control Group of CIDMA, University of Aveiro, and with the MIA Lab, University of La Rochelle, respectively supported by the FCT project UID/MAT/04106/2013, and by the CNRS & CNRST, Volubilis project MA/14/301.

The present issue contains nine papers authored by invited and contributed speakers of IMAME 2016. The conference attracted a total of 130 selected talks from extended abstract submissions. Of these, the guest editors invited the best sixteen ones for publication in DCDS-S. Their authors were then asked to prepare the corresponding articles, each of them underwent a double blind expert review process with anonymous feedback. Nine papers were finally accepted:

- *Optimality conditions for fractional variational problems with free terminal time*, by R. Almeida
- *Optimal number of Schur subdomains: application to semi-implicit finite volume discretization of semilinear reaction diffusion problem*, by H. Belhadj, M. Fihri, S. Khallouq and N. Nagid
- *Homogenization of the Landau–Lifshitz–Gilbert equation in a contrasted composite medium*, by C. Choquet, M. Moumni and M. Tilioua
- *A necessary condition of Pontryagin type for fuzzy fractional optimal control problems*, by O. S. Fard, J. Soolaki and D. F. M. Torres
- *On consensus in the Cucker–Smale type model on isolated time scales*, by E. Girejko, L. Machado, A. B. Malinowska and N. Martins

- *Noether currents for higher-order variational problems of Herglotz type with time delay*, by S. P. S. Santos, N. Martins and D. F. M. Torres
- *Finite difference and Legendre spectral method for a time-fractional diffusion convection equation for image restoration*, by M. R. Sidi Ammi and I. Jamiai
- *Modeling and optimal control of HIV/AIDS prevention through PREP*, by C. J. Silva and D. F. M. Torres
- *Fractional Herglotz variational problems of variable order*, by D. Tavares, R. Almeida and D. F. M. Torres

Our thanks go to the members of the Scientific and Organizing Committee of IMAME 2016, to the participants of the conference, as well as to all those who served in addition as reviewers for this special issue.

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