

Nonlinear Systems and Complexity

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Albert C. J. Luo

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Albert C.J. Luo • Hüseyin Merdan
Editors

Mathematical Modeling and Applications in Nonlinear Dynamics

 Springer

Editors

Albert C.J. Luo
Department of Mechanical and Industrial
Engineering
Southern Illinois University Edwardsville
Edwardsville, IL, USA

Hüseyin Merdan
Department of Mathematics
TOBB University of Economics
and Technology
Ankara, TURKEY

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Preface

This edited book collects seven chapters on mathematical modeling and applications in nonlinear dynamics for a deeper understanding of complex phenomena in nonlinear systems. The chapters of this edited book are selected from the 3rd International Conference on Complex Dynamical Systems: New Mathematical Concepts and Applications in Life Sciences (CDSC 2014), held at Ankara, Turkey, 24–26 November 2014. The aim of this conference was to promote research on differential equations and discrete and hybrid equations, especially in life sciences and chemistry. This conference was for the 60th birthday celebration of Professor Marat Akhmet, who is a faculty member of the Mathematics Department at Middle East Technical University, Turkey. After peer review, 54 papers were accepted for presentation from 17 countries. The chapters of this edited book are based on the invited lectures with extended results in nonlinear dynamical systems, and the edited book is dedicated to Prof. Akhmet's 60th birthday. The edited chapters include the following topics:

- Integrate-and-fire biological models with continuous/discontinuous couplings
- Analytical periodic solutions in nonlinear dynamical systems
- Dynamics of hematopoietic stem cells
- Dynamics of periodic evolution processes in pharmacotherapy
- Ultimate solution boundedness for differential equations with several delays
- Delay effects on the dynamics of the Lengyel–Epstein reaction-diffusion model
- Semilinear impulsive differential equation in an abstract Banach space

During this conference, comprehensive discussions on the above topics were made, led by invited recognized scientists. From such discussions, young scientists and students learned new methods, ideas, and results.

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Kazakhstan, for all financial support, and the authors and reviewers for supporting the conference and collection. We hope the results presented in this edited book will be useful for other specialists in complex dynamical systems.

Ankara, TURKEY
Edwardsville, IL, USA

Hüseyin Merdan
Albert C.J. Luo

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