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Series editor

Janusz Kacprzyk, Polish Academy of Sciences, Warsaw, Poland
e-mail: kacprzyk@ibspan.waw.pl

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Quanmin Zhu · Ahmad Taher Azar
Editors

Complex System Modelling and Control Through Intelligent Soft Computations

Springer

Editors
Quanmin Zhu
Department of Engineering Design
and Mathematics
University of the West of England
Bristol
UK

Ahmad Taher Azar
Faculty of Computers and Information
Benha University
Benha
Egypt

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Preface

Soft computing-based inductive approaches are concerned with the use of theories of fuzzy logic, neural networks and evolutionary computing to solve real-world problems that cannot be satisfactorily solved using conventional crisp computing techniques. Representation and processing of human knowledge, qualitative and approximate reasoning, computational intelligence, computing with words, and biological models of problem solving and optimization form key characteristics of soft computing, and are directly related to intelligent systems and applications. In recent years there has been rapid growth in the development and implementation of soft computing techniques in a wide range of applications, particularly those related to natural and man-made science and engineering systems.

This book is intended to present important applications of soft computing as reported from both analytical and practical points of view. The material is organized into 29 chapters. In its chapters, the book gives a prime introduction to soft computing with its principal components of fuzzy logic, neural networks, genetic algorithms and genetic programming with a self-contained, simple, readable approach. The book also includes a few of representative papers to cover industrial and development effort in the applications of intelligent systems through soft computing, which is given to guide the interested readers on their ad hoc applications. Advanced topics and future challenges are addressed as well, with the researchers in the field in mind. The introductory material, application-oriented techniques, and case studies should be particularly useful to practicing professionals. In brief summary, this book provides a general foundation for soft computing-based inductive methodologies/algorithms as well as their applications, in terms of providing multidisciplinary solutions in complex system modelling and control.

As the editors, we hope that the chapters in this book will stimulate further research in Complex system modelling and utilize them in real-world applications. We hope that this book, covering so many different aspects, will be of value to all readers.

The editors would like to take this opportunity to thank all the authors for their contributions to this textbook. Without the hard work of our contributors, this book would not have been possible. The encouragement and patience of Series Editor,

Prof. Janusz Kacprzyk and Dr. Leontina Di Cecco is very much appreciated. Without their continuous help and assistance during the entire course of this project, the production of the book would have taken a great deal longer. Special thanks to Holger Schaepe for her great effort during the publication process.

Bristol, UK Quanmin Zhu
Benha, Egypt Ahmad Taher Azar

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