Preface

The present book includes extended and revised versions of a set of selected papers from the Sixth International Joint Conference on Computational Intelligence (IJCCI 2014). IJCCI was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC). This conference was held in Rome, Italy, from October 22 to 24, 2014.

IJCCI was technically co-sponsored by IEEE Computational Intelligence Society, co-sponsored by International Federation of Automatic Control (IFAC), and held in cooperation with the ACM Special Interest Group on Artificial Intelligence (ACM SIGART), Association for the Advancement of Artificial Intelligence (AAAI), Asia Pacific Neural Network Assembly (APNNA), European Society for Fuzzy Logic and Technology (EUSFLAT), International Neural Network Society, and the International Fuzzy Systems Association.

Since its first edition in 2009, the purpose of the International Joint Conference on Computational Intelligence (IJCCI) has been to bring together researchers, engineers, and practitioners in computational technologies, especially those related to the areas of fuzzy computation, evolutionary computation, and neural computation. IJCCI is composed of three co-located conferences with each one specialized in one of the aforementioned areas. Namely:

- International Conference on Evolutionary Computation Theory and Applications (ECTA)
- International Conference on Fuzzy Computation Theory and Applications (FCTA)
- International Conference on Neural Computation Theory and Applications (NCTA)

Their aim is to provide major forums for scientists, engineers, and practitioners interested in the study, analysis, design, and application of these techniques to all fields of human activity.

In ECTA, modeling and implementation of bio-inspired systems, both theoretically and in a broad range of application fields, is the central scope. Considered as a subfield of computational intelligence focused on optimization problems, evolutionary computation is associated with systems that use computational models of evolutionary processes as the key elements in design and implementation, i.e., computational techniques which are inspired by the evolution of biological life in the natural world. A number of bio-inspired models have been proposed, including genetic programming, genetic algorithms, evolution strategies, evolutionary programming, swarm optimization, and ant colony optimization.

In FCTA, results and perspectives of modeling and implementation of fuzzy systems, in a broad range of fields, are presented and discussed. Fuzzy computation, based on the theory of fuzzy sets and fuzzy logic, is dedicated to the solution of information processing, system analysis, knowledge extraction from data, and decision problems. Fuzzy computation is taking advantages of the powerful available technologies to find useful solutions for problems in many fields, such as medical diagnosis, automated learning, image processing and understanding, and systems control.

NCTA is focused on modeling and implementation of neural-based computation and related issue as those dealing with artificial neural networks and brain's structure issued architectures. Neural computation and artificial neural networks have seen a continuous explosion of interest in recent decades, and are being successfully applied across an impressive range of problem domains, including areas as diverse as finance, medicine, engineering, geology, and physics, providing appealing solutions to problems as varied as prediction, classification, decision-making, or control. Numerous architectures, learning strategies and algorithms have been introduced in this highly dynamic field in the last couple of decades.

The joint conference IJCCI received 210 paper submissions from 51 countries, of which 15 % were presented as full papers. The high quality of the papers received imposed difficult choices in the review process. To evaluate each submission, a double-blind paper evaluation method was used: each paper was reviewed by at least two experts from the independent international Program Committee, in a double-blind review process, and most papers had three reviews or more. This book includes revised and extended versions of a strict selection of the best papers presented at the conference.

On behalf of the Conference Organizing Committee, we would like to thank all participants. First of all to the authors, whose quality work is the essence of the conference, and to the members of the Program Committee, who helped us with their expertise and diligence in reviewing the papers. As we all know, producing a

post-conference book, within the high technical level exigency, requires efforts of many individuals. We wish to thank also all the members of our Organizing Committee, whose work and commitment were invaluable.

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