

# Preface

IBICA'15 is the 6th International Conference on Innovations in Bio-Inspired Computing and Applications. The aim of IBICA is to provide a platform for world research leaders and practitioners, to discuss the "full spectrum" of current theoretical developments, emerging technologies, and innovative applications of bio-inspired computing, emerging technologies. Bio-inspired computing is currently one of the most exciting research areas, and it is continuously demonstrating exceptional strength in solving complex real-life problems. The main driving force of the conference is to further explore the intriguing potential of bio-inspired computing.

The conference includes the keynote address and contributed papers. The papers were solicited in the following areas:

Topics include, but are not limited to:

## Bio-inspired Computing

- Ant Colony System
- Artificial Immune Systems
- Artificial Intelligence
- Artificial Neural Networks
- Cellular Automaton
- Cognitive Modeling
- DNA Computing
- Differential Evolution
- Emergent Systems
- Evolutionary Computations
- Evolutionary Strategies/Programming
- Fuzzy Logic
- Genetic Algorithms/Programming
- Granular Computing

Neutrosophic Systems  
Organic Computing  
P Systems  
Particle Swarm Optimization

## **Emerging Technologies and Applications**

Biomedicine  
Bioinformatics  
Business Intelligence  
Cloud Computing  
Data Mining and Knowledge Discovery  
E-learning  
Financial Computing  
Healthcare  
Life Sciences Multimedia Applications  
Network Management  
Robotics  
Social Networks Analysis and Computing  
System Control and Optimization  
Ubiquitous/Pervasive Computing  
Web Intelligence  
Wireless/Sensor Networks  
Other Applications

## **Intelligent Distributed and High-Performance Architecture**

Hybrid systems involving software agents and human actors  
Intelligent cloud infrastructures  
Agent-based wireless sensor networks  
Distributed frameworks and middleware for the Internet of Things  
GPU, multicore, and many-core intelligent computing  
Intelligent grid  
Intelligent high-performance architectures  
Context-aware intelligent computing  
Virtualization infrastructures for intelligent computing

The aim is to bring together worldwide leading researchers, developers, practitioners, and educators interested in advancing the state of the art in biologically inspired computing for exchanging knowledge that encompasses a broad range of disciplines among various distinct communities. The conference will provide an exceptional platform to researchers to meet and discuss the utmost solutions,

scientific results, and methods in solving intriguing problems with people who are actively involved in these evergreen fields.

IBICA 2015 received contributions from more than 15 countries. Each paper was sent to at least 5 reviewers from our International Program Committee in a standard peer-review evaluation, and based on the recommendations 51 papers were included in the proceedings. IBICA 2015 is technically supported by the IEEE SMC Technical Committee on Soft Computing. Many people have collaborated and worked hard to make IBICA 2015 a success. First and foremost, we would like to thank all the authors for submitting their papers to the conference, and for their presentations and discussions during the conference. Our thanks to the Program Committee members and reviewers, who carried out the most difficult work by carefully evaluating the submitted papers. We also thank the Springer Series on Advances in Intelligent Systems and Computing Editorial Team: Prof. Janusz Kacprzyk, Dr. Thomas Ditzinger, and Mr. Holger Schaepe for the wonderful support to publish this volume so quickly.

We wish all IBICA 2015 delegates an exciting meeting and a pleasant stay in Kochi, India. Enjoy the conference!

## **General Chairs**

Vaclav Snasel, VSB-Technical University of Ostrava, Czech Republic  
Vincent H Wilson, Toc H Institute of Science and Technology, India  
Ajith Abraham, Machine Intelligence Research Labs (MIR Labs), USA

## **Program Chairs**

Millie Pant, Indian Institute of Technology, Roorkee, India  
Pavel Kršmer, VSB-Technical University of Ostrava, Czech Republic

Innovations in Bio-Inspired Computing and Applications  
Proceedings of the 6th International Conference on  
Innovations in Bio-Inspired Computing and Applications  
(IBICA 2015) held in Kochi, India during December  
16-18, 2015

Snášel, V.; Abraham, A.; Krömer, P.; Pant, M.; Muda, A.K.  
(Eds.)

2016, XIII, 588 p. 199 illus., 75 illus. in color., Softcover  
ISBN: 978-3-319-28030-1