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Bio-inspired Computing: Theories and Applications

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Revised Selected Papers, Part I

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Preface

Bio-inspired computing is a field of study that abstracts computing ideas (data structures, operations with data, ways to control operations, computing models, artificial intelligence, etc.) from biological systems or living phenomena such as cells, tissues, neural networks, the immune system, an ant colony, or evolution. The areas of bio-inspired computing include neural networks, brain-inspired computing, neuromorphic computing and architectures, cellular automata and cellular neural networks, evolutionary computing, swarm intelligence, fuzzy logic and systems, DNA and molecular computing, membrane computing, and artificial intelligence, as well as their application in other disciplines such as machine learning, image processing, computer science, and cybernetics. Bio-Inspired Computing: Theories and Applications (BIC-TA) is a series of conferences that aims to bring together researchers working in the main areas of bio-inspired computing to present their recent results, exchange ideas, and cooperate in a friendly framework.

Since 2006, the conference has taken place in Wuhan (2006), Zhengzhou (2007), Adelaide (2008), Beijing (2009), Liverpool and Changsha (2010), Penang (2011), Gwalior (2012), Anhui (2013), Wuhan (2014), Anhui (2015), Xi'an (2016), Harbin (2017), and Beijing (2018). Following the success of previous editions, the 14th International Conference on Bio-Inspired Computing: Theories and Applications (BIC-TA 2019) was held in Zhengzhou, China, during November 22–25, 2019, and was organized by Zhongyuan University of Technology with the support of Zhengzhou University, Zhengzhou University of Light Industry, Henan Normal University, Henan University of Technology, North China University of Water Resources and Electric Power, Pingdingshan University, Nanyang Institute of Technology, Peking University, Huazhong University of Science and Technology, Henan Electrotechnical Society, and Operations Research Society of Hubei.

We would like to thank the President of Zhongyuan University of Technology, Prof. Zongmin Wang, and Academician of the Chinese Academy of Engineering, Prof. Xiangke Liao, for commencing the opening ceremony.

Thanks are also given to the keynote speakers for their excellent presentations: Mitsuo Gen (Tokyo University of Science, Japan), Yaochu Jin (University of Surrey, UK), Derong Liu (Guangdong University of Technology, China), Ponnuthurai Nagaratnam Suganthan (Nanyang Technological University, Singapore), Kay Chen Tan (City University of Hong Kong, China), Mengjie Zhang (Victoria University of Wellington, New Zealand), and Ling Wang (Tsinghua University, China).

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A special thanks goes to Prof. Guangzhao Cui for his extensive guidance and assistance in the local affairs and financial support of the conference.

BIC-TA 2019 attracted a wide spectrum of interesting research papers on various aspects of bio-inspired computing with a diverse range of theories and applications. 121 papers were selected for inclusion in the BIC-TA 2019 proceedings, publish by Springer Nature in the series *Communications in Computer and Information Science* (CCIS).

We are grateful to the external referees for their careful and efficient work in the reviewing process, and in particular the Program Committee chairs Maoguo Gong, Rammohan Mallipeddi, Ponnuthurai Nagaratnam Suganthan, Zhihui Zhan, and the Program Committee members. The warmest thanks are given to all the authors for submitting their interesting research work.

We thank Lianghao Li, Wenting Xu, Taosheng Zhang, et al. for their help in collecting the final files of the papers and editing the volume. We thank Zheng Zhang and Lianlang Duan for their contribution in maintaining the website of BIC-TA 2019 (http://2019.bicta.org/). We also thank all the other volunteers, whose efforts ensured the smooth running of the conference.

Special thanks are due to Springer Nature for their skilled cooperation in the timely production of these volumes.

December 2019

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