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Volume 422

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Frontier Computing

Theory, Technologies and Applications
FC 2016

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ISSN 1876-1100 ISSN 1876-1119 (electronic)
Lecture Notes in Electrical Engineering
ISBN 978-981-10-3186-1 ISBN 978-981-10-3187-8 (eBook)
DOI 10.1007/978-981-10-3187-8

Library of Congress Control Number: 2017937918

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Printed on acid-free paper

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The registered company is Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Message from General Chairs

The International Conference on Frontier Computing—Theory, Technologies, and Applications (FC) was first proposed in early 2010 on an IET executive meeting. This conference series aims at providing an open forum to reach a comprehensive understanding to the recent advances and emergence in information technology, science, and engineering, with the themes in the scope of Communication Network Technology and Applications, Communication Network Technology and Applications, Business Intelligence and Knowledge Management, Web Intelligence, and any related fields that prompt the development of information technology. This will be the fourth event of the series, in which fruitful results can be found in the digital library or conference proceedings of FC 2010 (Taichung, Taiwan), FC 2012 (Xining, China), FC 2013 (Gwangju, Korea), and FC 2015 (Bangkok, Thailand). Each event brings together the researchers worldwide to have excited and fruitful discussions as well as the future collaborations.

The papers accepted for inclusion in the conference proceeding primarily cover the topics: database and data mining, networking and communications, Web and Internet of things, embedded system, soft computing, social network analysis, security and privacy, optics communication, and ubiquitous/pervasive computing. Many papers have shown their great academic potential and value, and, in addition, indicate promising directions of research in the focused realm of this conference series. We believe that the presentations of these accepted papers will be more exciting than the papers themselves, and lead to creative and innovative applications. We hope that the attendees (and readers as well) will find these results useful and inspiring to your field of specialization and future research.

On behalf of the organizing committee, we would like to thank the members of the organizing and the program committees, the authors, and the speakers for their dedication and contributions that make this conference possible. We would like to thank and welcome all participants to the capital city of Japan—Tokyo. Tokyo is a city with a long and remarkable history. To get a picture of North-East Asia, this city will certainly be an entry. Though most of countries may share some similar characteristics, you will find that culture of Japan is very rich from different perspectives, such as art, religion, nomadic lifestyle, food, and music. Tokyo is a

world-class and well-known city, with modern facilities and convenience traffic. We encourage the participants to take this chance to see and experience Japan, especially the remote counties and the nomadic lifestyle there. We also sincerely hope that all participants from overseas and from Japan enjoy the technical discussions at the conference, build a strong friendship, and establish ties for future collaborations.

We send our sincere appreciations to the authors for their valuable contributions and the other participants of this conference. The conference would not have been possible without their support. Thanks are also due to the many experts who contributed to making the event a success.

July 2016

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Fitness Landscape Information for Acceleration and Applications for Human Science

Abstract

We introduce two topics in evolutionary computation (EC) research. The first topic is to estimate fitness landscape information and use it to accelerate EC convergence. Some of these approaches include approximation of fitness landscape and estimate a rough point of the global optimum, estimation of unimodal or multimodal shape of the landscape, and estimation of the global optimum from the movement direction of individuals between generations. The estimated location of the global optimum can be used as an elite individual, and shape information of a fitness landscape can be used to change EC operational parameters adaptively. They result fast EC convergence. The second topic is a new type of EC applications, human science. Some of these researches include measuring mental dynamic range, obtaining unknown knowledge on auditory system, and awareness science as a support system of human awareness.

Biography

Professor Takagi had worked for the Central Research Laboratories of Matsushita Electric Industrial Co., Ltd. from April 1981 to March 1995. During these 14 years, he has researched on software engineering, speech recognition, neural networks, fuzzy systems, and genetic algorithms.

He was a Visiting Industrial Fellow of the University of California at Berkeley from October 1991 to September 1993, hosted by Prof. Lotfi A. Zadeh of Computer Science Division. Besides his visiting research, he played an educational role through research projects and technical meeting with students, and BISC special seminar on Soft Computing of Computer Science Division. He has worked for Kyushu Institute of Design since April 1995 as an associate professor. He belonged to Department of Acoustic Design in 1995–1999 and Department of Art and Information Design in 1999–2003. Kyushu Institute of Design and Kyushu University merged into one on October 1, 2003, and his affiliation name changed to Faculty of Design, Kyushu University. Now, he is a Professor of Kyushu University.

Professor Takagi is interested in computational intelligence such as neural networks, fuzzy systems, evolutionary computations, and other so-called soft computing technologies, especially cooperation of these technologies. Currently, his interest focuses on interactive evolutionary computation which aims the cooperation of human and evolutionary computation. He is also interested in signal processing and human-machine interface.

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