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Simulated Evolution and Learning

11th International Conference, SEAL 2017 Shenzhen, China, November 10–13, 2017 Proceedings

Springer

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Preface

This LNCS volume contains papers presented at SEAL 2017, the 11th International Conference on Simulated Evolution and Learning, held during November 10–13, 2017, in Shenzhen, China. SEAL is a prestigious international conference series in evolutionary computation and learning. This biennial event was first held in Seoul, Korea, in 1996, and then in Canberra, Australia (1998), Nagoya, Japan (2000), Singapore (2002), Busan, Korea (2004), Hefei, China (2006), Melbourne, Australia (2008), Kanpur, India (2010), Hanoi, Vietnam (2012), and Dunedin, New Zealand (2014). The Steering Committee decided to change the conference year from even to old years from 2017 to avoid clashing with WCCI.

We received 145 paper submissions from nearly 30 countries. After a rigorous peer-review process involving at least three reviewers for each paper, the best 40 papers were selected to be presented at the conference as oral presentations (acceptance rate of 27.6%) and an additional 45 papers as poster presentations.

The papers included in this volume cover a wide range of topics in simulated evolution and learning. The accepted papers have been classified into the following main categories: (a) evolutionary optimization, (b) evolutionary multi-objective optimization, (c) evolutionary machine learning, (d) theoretical developments, (e) feature reduction and dimensionality reduction, (f) dynamic and uncertain environments, (g) real-world applications, (h) adaptive systems, and (i) swarm intelligence.

The conference featured seven distinguished keynote speakers: Professors Kenneth De Jong, Sanaz Mostaghim, Yew Soon Ong, Philip C.L. Chen, Jun Wang, Hisao Ishibuchi, and Yiu-ming Cheung. The seven keynotes covered the state-of-the-art research topics in simulated evolution and learning such as co-evolution, multi-objective and many-objective optimiztaion, neuro-evolution, broad and deep learning, transfer learning, and multitask optimization. In addition, SEAL 2017 also featured an Editor-in-Chief Forum, including the current and past Editor-in-Chiefs of the prestigious journals such as *IEEE Transactions on Evolutionary Computation* (Prof. Xin Yao and Prof. Kay Chen Tan); *IEEE Transactions on Cybernetics* (Prof. Jun Wang); *IEEE Transactions on Systems, Man, and Cybernetics: Systems* (Prof. Philip C.L. Chen); *IEEE Transactions on Emergent Topics in Computational Intelligence* (Prof. Yew Soon Ong); and *IEEE Computational Intelligence Magazine* (Prof. Hisao Ishibuchi). We were very fortunate to have such internationally renowned research leaders giving talks at SEAL 2017, given their busy schedules. Their presence at the conference was yet another indicator of the importance of the SEAL conference series on the international research map.

SEAL 2017 also included the opening of the Shenzhen Key Lab for Computational Intelligence, with a number of distinguished professors including fellows (academicians) from the Chinese Academy of Sciences. The first SUSTech-VUW Joint Workshop on Evolutionary Optimization and Learning was also held at the conference, with the key people in this field from Southern University of Science and Technology

(SUSTech) and Victoria University of Wellington (VUW). SEAL 2017 also included five tutorials delivered by Prof. Kenneth De Jong, Prof. Xiaodong Li, Prof. Mengjie Zhang, Prof. Jing Liu, and Prof. Mustafa Misir, which were free to all conference participants. These five tutorials covered some of the hottest topics in evolutionary computation and learning and their applications such as unified evolutionary computation, evolutionary large-scale global optimization, genetic programming and evolutionary deep learning, evolutionary complex and social networks, and online–offline algorithm selection. They provided an excellent start to the four-day conference.

The success of a conference depends on its authors, reviewers, participants, and Organizing Committees. SEAL 2017 was no exception. We are very grateful to all the authors for their paper submissions and to all the reviewers for their outstanding effort in refereeing the papers within a tight schedule. We relied heavily upon a team of volunteers to keep SEAL 2017 running smoothly and efficiently. They were the true heroes working behind the scene. We are most grateful to all the student volunteers for their great efforts and contributions.

We would also like to thank our sponsors for providing all the support to SEAL 2017, including the Department of Computer Science and Engineering, Southern University of Science and Technology (China), School of Engineering and Computer Science and Evolutionary Computation Research Group, Victoria University of Wellington (New Zealand), City University of Hong Kong (China), RMIT University (Australia), Springer, and EasyChair. Particular thanks should go to Southern University of Science and Technology (China), who provided significant financial support to the conference.

November 2017

Yuhui Shi
Kay Chen Tan
Mengjie Zhang
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The 11th International Conference on Simulated Evolution and Learning (SEAL 2017) was organised and hosted by Southern University of Science and Technology, Shenzhen, China.

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SEAL 2017 Keynotes

Co-evolutionary Algorithms: Theory and Practice
Kenneth De Jong
Multi-Objective Optimiztaion and Decision Making in Dynamic Environments
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Why Restrict to One Task or Problem? From Transfer to Multitask Optimization
Yew Soon Ong
Evolutionary Many-Objective Optimization and Performance Evaluation
Hisao Ishibuchi
Neurodynamic Approaches to Distributed, Global, and Multi-objective Optimization
Jun Wang
Broad Learning System: An Effective and Efficient Incremental Learning System Without the Need for Deep Architecture
C.L. Philip Chen
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SEAL 2017 Tutorials

Evolutionary Computation: A Unified Approach
Kenneth De Jong
Evolutionary Large-Scale Global Optimization: An Introduction
Xiaodong Li
Genetic Programming: Recent Developments and Applications
Mengjie Zhang
Evolutionary Computation and Complex Networks
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Algorithm Selection Online + Offline Techniques
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