

# International Workshop on Benchmarking of Computational Intelligence Algorithms (BOCIA) Tenth International Conference on Advanced Computational Intelligence (ICACI 2018) March 29-31, 2018 in Xiamen, China <http://iao.hfuu.edu.cn/bocia18>

**BOCIA**, the International Workshop on Benchmarking of Computational Intelligence Algorithms, a part of the Tenth International Conference on Advanced Computational Intelligence (ICACI 2018), is cordially inviting the submission of original and unpublished research papers.

Computational Intelligence (CI) is a huge and expanding field which is rapidly gaining importance, attracting more and more interests from both academia and industry. It includes a wide and ever-growing variety of optimization and machine learning algorithms, which, in turn, are applied to an even wider and faster growing range of different problem domains. For all of these domains and application scenarios, we want to pick the best algorithms. Actually, we want to do more, **we want to improve upon the best algorithm**. This **requires a deep understanding** of the problem at hand, the performance of the algorithms we have for that problem, the features that make instances of the problem hard for these algorithms, and the parameter settings for which the algorithms perform the best. Such knowledge can only be obtained empirically, by collecting data from experiments, by analyzing this data statistically, and by mining new information from it. Benchmarking is the engine driving research in the fields of optimization and machine learning for decades, while its potential has not been fully explored. **Benchmarking the algorithms of Computational Intelligence is an application of Computational Intelligence itself!** This workshop wants to bring together experts on benchmarking of optimization and machine learning algorithms. It provides a common forum for them to exchange findings, to explore new paradigms for performance comparison, and to discuss issues such as

- mining of higher-level information from experimental results
- modelling of algorithm behaviors and performance
- visualizations of algorithm behaviors and performance
- statistics for performance comparison (robust statistics, PCA, ANOVA, statistical tests, ROC, ...)
- evaluation of real-world goals such as algorithm robustness, reliability, and implementation issues
- theoretical results for algorithm performance comparison
- comparison of theoretical and empirical results
- new benchmark problems
- automatic algorithm configuration
- algorithm selection
- the comparison of algorithms in “non-traditional” scenarios such as
  - o multi- or many-objective domains
  - o parallel implementations, e.g., using GPUs, MPI, CUDA, clusters, or running in clouds
  - o large-scale problems or problems where objective function evaluations are costly
  - o dynamic problems or where the objective functions involve randomized simulations or noise
  - o deep learning and big data setups
- comparative surveys with new ideas on
  - o dos and don'ts, i.e., best and worst practices, for algorithm performance comparison
  - o tools for experiment execution, result collection, and algorithm comparison
  - o benchmark sets for certain problem domains and their mutual advantages and weaknesses

All accepted papers in this workshop will be included in the Proceedings of the IEEE ICACI 2018 published by IEEE Press and indexed by EI. Authors of selected papers will be invited to submit extended versions of these papers to the *Special Issue on Benchmarking of Computational Intelligence Algorithms* appearing in the *Applied Soft Computing* journal by Elsevier B.V., indexed by EI and SCIE (see the last page of this CfP, <http://iao.hfuu.edu.cn/bocia-asoc-si>).



<del>Paper Submission Deadline:</del>	<del>15 November 2017</del>	<del>1 December 2017 (extended)</del>
<del>Notification of Acceptance:</del>	<del>15 December 2017</del>	<del>30 December 2017 (extended)</del>
<del>Camera Ready Copy Due:</del>	<del>15 January 2018</del>	
<del>Author Registration:</del>	<del>15 January 2018</del>	
<del>Conference Presentation:</del>	<del>29-31 March 2018</del>	

For more information please contact Thomas Weise at [tweise@hfuu.edu.cn](mailto:tweise@hfuu.edu.cn).

## Chairs

- Thomas Weise, Institute of Applied Optimization, Hefei University, Hefei, China
- Bin Li, University of Science and Technology of China, Hefei, China
- Markus Wagner, University of Adelaide, Adelaide, SA, Australia
- Xingyi Zhang, Anhui University, Hefei, China
- Jörg Lässig, University of Applied Sciences Zittau/Görlitz, Görlitz, Germany

## International Program Committee

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- Wenxiang Chen, Colorado State University, Fort Collins, CO, USA
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- Markus Wagner, University of Adelaide, Adelaide, SA, Australia
- Thomas Weise, Institute of Applied Optimization, Hefei University, Hefei, China
- Yang Yu, Nanjing University, Nanjing, China
- Xingyi Zhang, Anhui University, Hefei, China



## Chair Biographies



**Prof. Dr. Thomas Weise** obtained the MSc in Computer Science in 2005 from the Chemnitz University of Technology and his PhD from the University of Kassel in 2009. He then joined the University of Science and Technology of China (USTC) as PostDoc and subsequently became Associate Professor at the USTC-Birmingham Joint Research Institute in Intelligent Computation and Its Applications (UBRI) at USTC. In 2016, he joined Hefei University as Full Professor to found the Institute of Applied Optimization at the Faculty of Computer Science and Technology. Prof.

Weise has more than seven years of experience as a full time researcher in China, having contributed significantly both to fundamental as well as applied research. He has more than 80 scientific publications in international peer reviewed journals and conferences. His book “Global Optimization Algorithms – Theory and Application” has been cited more than 730 times. He has acted as reviewer, editor, or program committee member at 70 different venues.



**Prof. Dr. Bin Li** received the B.S. degree from Hefei University of Technology, Hefei, China, in 1992, the M.Sc. degree from Institute of Plasma Physics, China Academy of Science, Hefei, China, in 1995, and the Ph.D. degree from University of Science and Technology of China (USTC), China in 2001. He is currently a professor with the School of Information Science and Technology, USTC, Hefei, China. He has authored and co-authored more than 40 refereed publications. His major research interests include evolutionary computation, memetic algorithms, pattern recognition, and real-world applications. Dr. Li is the Founding Chair of IEEE CIS Hefei Chapter,

Counselor of IEEE USTC Student Branch, senior member of Chinese Institute of Electronics (CIE), member of the Technical Committee of Electronic Circuits and Systems Section of CIE.



**Dr. Markus Wagner** is a Senior Lecturer at the School of Computer Science, University of Adelaide, Australia. He has done his PhD studies at the Max Planck Institute for Informatics in Saarbrücken, Germany and at the University of Adelaide, Australia. His research topics range from mathematical runtime analysis of heuristic optimization algorithms and theory-guided algorithm design to applications of heuristic methods to renewable energy production, professional team cycling and software engineering. So far, he has been a program committee member 30 times, and he has written over 70 articles with over 70 different co-authors. He has chaired

several education-related committees within the IEEE CIS, is Co-Chair of ACALCI 2017 and General Chair of ACALCI 2018.



**Prof. Dr. Xingyi Zhang** received the B.Sc. from Fuyang Normal College in 2003, and the M.Sc. in 2006 and Ph.D. in 2009 both from Huazhong University of Science and Technology. Currently, he is a professor in the School of Computer Science and Technology, Anhui University. His main research interests include unconventional models and algorithms of computation, multi-objective evolutionary optimization and membrane computing. He is the chair of 2017 Data Driven Optimization of Complex Systems and Applications and 2015 Asian Conference on Membrane Computing. He also serves as Editorial Board Member of Complex & Intelligent Systems and

International Journal of Bio-inspired Computing.



**Prof. Dr. Jörg Lässig** leads the Enterprise Application Development Group (EAD) of the University of Applied Sciences Zittau/Görlitz (HSZG) in Germany since 2011. He holds degrees in Computer Science, Computational Physics, and received a Ph.D. in Computer Science for his research on efficient algorithms and models for the generation and control of cooperation networks at Chemnitz University of Technology (Germany), which he finished in 2009. Prof. Lässig has PostDocs at the Università della Svizzera italiana, Institute of Computational Sciences (Lugano, Switzerland) and the International Computer Science Institute Berkeley (California, USA).

His EAD research group at HSZG and his IT security group with the Fraunhofer Society are focusing on topics concerned with intelligent data driven technologies for state-of-the-art IT infrastructures and services. His research directions include sustainable IT services, energy efficiency benchmarking, regional carbon footprints and energy informatics.

## Instructions for Authors

Prospective authors are invited to submit papers of no more than **six** pages in IEEE Manuscript Format for Conference Proceedings (double column, A4 format), including results, figures and references, with a maximum file size of 4MB, in PDF format.

The papers are to be submitted via the official conference website submission form (<http://easychair.org/conferences/?conf=icaci2018>) where the "International Workshop on Benchmarking of Computational Intelligence Algorithms" should be selected as **track**.

## Hosting Event

### **The Tenth International Conference on Advanced Computational Intelligence (ICACI 2018) Xiamen, China, March 29–31, 2018**

ICACI 2018 aims to provide a high-level international forum for scientists, engineers, and educators to present the state-of-the-art research and applications in computational intelligence. The conference will feature plenary speeches given by world renowned scholars, regular sessions with broad coverage, and special sessions focusing on popular topics. In addition, best paper awards will be given during the conference. The proceedings of ICACI 2018 will be submitted to the IEEE Xplore and EI Compendex. Moreover, selected papers will be published in special issues of related journals. The conference will favor papers representing advanced theories and innovative applications in computational intelligence.

#### **Topics areas include, but not limited to:**

computational neuroscience, connectionist theory and cognitive science, mathematical modeling of neural systems, neurodynamic analysis, neurodynamic optimization and adaptive dynamic programming, embedded neural systems, probabilistic and information-theoretic methods, principal and independent component analysis, hybrid intelligent systems, supervised, unsupervised and reinforcement learning, deep learning, brain imaging and neural information processing, neuroinformatics and bioinformatics, support vector machines and kernel methods, autonomous mental development, data mining, pattern recognition, time series analysis, image and signal processing, robotic and control applications, telecommunications, transportation systems, intrusion detection and fault diagnosis, hardware implementation, real-world applications, big data processing, fuzzy systems, fuzzy logic, fuzzy set theory, fuzzy decision making, fuzzy information processing, fuzzy logic control, evolutionary computation, ant colony optimization, genetic algorithms, parallel and distributed algorithms, particle swarm optimization, evolving neural networks, evolutionary fuzzy systems, evolving neuro-fuzzy systems, evolutionary games and multi-agent systems, intelligent systems applications.



# Special Issue on Benchmarking of Computational Intelligence Algorithms

Applied Soft Computing, Elsevier B.V.

<http://iao.hfuu.edu.cn/bocia-asoc-si>

Computational Intelligence (CI) is a huge and expanding field which is rapidly gaining importance, attracting more and more interests from both academia and industry. It includes a wide and ever-growing variety of optimization and machine learning algorithms, which, in turn, are applied to an even wider and faster growing range of different problem domains. For all of these domains and application scenarios, we want to pick the best algorithms. Actually, we want to do more, **we want to improve upon the best algorithm**. This requires a **deep understanding** of the problem at hand, the performance of the algorithms we have for that problem, the features that make instances of the problem hard for these algorithms, and the parameter settings for which the algorithms perform the best. Such knowledge can only be obtained empirically, by collecting data from experiments, by analyzing this data statistically, and by mining new information from it. Benchmarking is the engine driving research in the fields of optimization and machine learning for decades, while its potential has not been fully explored. **Benchmarking the algorithms of Computational Intelligence is an application of Computational Intelligence itself!** This virtual special issue of the EI/SCIE-indexed *Applied Soft Computing* journal published by Elsevier solicits novel contributions from this domain according to the topics listed below.

## Topics of Interest

- mining of higher-level information from experimental results
- modelling of algorithm behaviors and performance
- visualizations of algorithm behaviors and performance
- statistics for performance comparison (robust statistics, PCA, ANOVA, statistical tests, ROC, ...)
- evaluation of real-world goals such as algorithm robustness, reliability, and implementation issues
- theoretical results for algorithm performance comparison
- comparison of theoretical and empirical results
- new benchmark problems
- automatic algorithm configuration and selection
- the comparison of algorithms in “non-traditional” scenarios such as
  - o multi- or many-objective domains
  - o parallel implementations, e.g., using GPUs, MPI, CUDA, clusters, or running in clouds
  - o large-scale problems or problems where objective function evaluations are costly
  - o dynamic problems or where the objective functions involve randomized simulations or noise
  - o deep learning and big data setups
- comparative surveys with new ideas on
  - o dos and don'ts, i.e., best and worst practices, for algorithm performance comparison
  - o tools for experiment execution, result collection, and algorithm comparison
  - o benchmark sets for certain problem domains and their mutual advantages and weaknesses
- survey and review of benchmarking, algorithm performance statistics, and performance-related theorems
- performance indicators, objective (problem) reduction

The focus of this special issue is the methodology of exploring, comparing, and understanding algorithm performance. Submissions on this topic in the fields of optimization, machine learning, metaheuristics, decision making, operational research, business logic, fuzzy logic, fuzzy information processing are welcome. The goal of this special issue is *not* to introduce new optimization algorithms or new real-world problems.

## Submission Process

The *Applied Soft Computing* journal subscribes to the concept of *Virtual Special Issues* (VSIs). In a VSI, submissions are made through the editorial system <http://ees.elsevier.com/asoc/> at any time until the final submission deadline. They go through the normal editorial process (managed by the guest editors), and, if accepted, are published immediately after acceptance. Accepted papers can appear at different times, but are bundled to the VSI.

**IMPORTANT: Please choose “VSI: Benchmarking CI” when specifying the Article Type.**

Please send any inquiries to T. Weise at [tweise@hfuu.edu.cn](mailto:tweise@hfuu.edu.cn), CC to [markus.wagner@adelaide.edu.au](mailto:markus.wagner@adelaide.edu.au).

## Important Dates

Virtual Special Issue Start: July 2018

Final Deadline for Submissions: 14<sup>th</sup> April 2019

Notification at most 12 weeks after submission.

Up to 2 rounds of revisions.

Publication immediately after receipt of accepted final version.

