

Good Benchmarking Practices for Evolutionary Computation (BENCHMARK)

at Sixteenth International Conference on Parallel Problem Solving from Nature (PPSN XVI)
September 5-9, 2020, Leiden, The Netherlands

<https://sites.google.com/view/benchmarking-network/home/PPSN20>

see also <http://iao.hfuu.edu.cn/benchmark-ppsn20>

In the era of explainable and interpretable AI, it is increasingly necessary to develop a deep understanding of how algorithms work and how new algorithms compare to existing ones, both in terms of strengths and weaknesses. For this reason, benchmarking plays a vital role for understanding algorithms' behavior. Even though benchmarking is a highly-researched topic within the evolutionary computation community, there are still a number of open questions and challenges that should be explored:

- (i) most commonly-used benchmarks are too small and cover only a part of the problem space,
- (ii) benchmarks lack the complexity of real-world problems, making it difficult to transfer the learned knowledge to work in practice,
- (iii) we need to develop proper statistical analysis techniques that can be applied depending on the nature of the data, and
- (iv) we need to develop user-friendly, openly accessible benchmarking software.

This enables a culture of sharing resources to ensure reproducibility, and which helps to avoid common pitfalls in benchmarking optimization techniques. As such, we need to establish new standards for benchmarking in evolutionary computation research so we can objectively compare novel algorithms and fully demonstrate where they excel and where they can be improved.

The topics of interest for this workshop include, but are not limited to:

- performance measures for comparing algorithms behavior,
- novel statistical approaches for analyzing empirical data,
- the selection of meaningful benchmark problems,
- landscape analysis,
- data mining approaches for understanding algorithm behavior,
- transfer learning from benchmark experiences to real-world problems, and
- benchmarking tools for executing experiments and analysis of experimental results.

We particularly welcome position statements addressing or identifying open challenges in benchmarking optimization techniques. We also suggest topics for in-depth discussions. Please also consider to suggest alternative discussion formats - we want this to be a real workshop, not yet another mini-conference!

Please send your suggestions for presentations and/or discussions by e-mail to Carola.Doerr@mpi-inf.mpg.de with CC to kerschke@uni-muenster.de, tome.eftimov@ijs.si, and m.preuss@liacs.leidenuniv.nl.

There are no format requirements. You can submit your ideas by simple mail, or as PDF. Please indicate the format of your suggested contribution (talk, discussion, breakout, brainstorming, etc.) and how much time you suggest for this activity.

Please note that PPSN workshop papers are not published in the conference proceedings. However, if you want your contribution to be listed in the conference proceedings, please submit it to us before June 8, anywhere on Earth. Notification of acceptance will be on June 15. **At least one author from each accepted contribution must register for the conference by June 22, pay the conference fee, and be present at the workshop.** The conference takes place from September 5 to 6, 2020.

If you do not care about being listed in the conference proceedings, you can send us your ideas/contributions/position papers/suggested activities/... any time, ideally before July 31, 2020.

For more information please contact Carola Doerr at Carola.Doerr@mpi-inf.mpg.de.

Workshop History

This workshop emerged from an initiative at GECCO 2019, which was launched to consolidate the various activities around benchmarking. We are proud that our workshop is organized by a large number of colleagues who jointly cover a broad spectrum of benchmarking aspects. Most of the organizers are experienced in workshop organization, and will support the junior fellow in making their first experiences.

List of Organizers

The workshop is co-organized by the following people (alphabetically ordered list). All of them are contributing equally to the workshop.

- Thomas Bäck, Leiden University, Leiden, The Netherlands
- Thomas Bartz-Beielstein, Technical University of Cologne, Köln (Cologne), Germany
- Jakob Bossek, The University of Adelaide, Adelaide, Australia
- Bilel Derbel, University of Lille, Lille, France
- Carola Doerr, CNRS and Sorbonne University, Paris, France
- Tome Eftimov, Stanford University, CA, USA and Jožef Stefan Institute, Ljubljana, Slovenia
- Pascal Kerschke, University of Münster, Münster, Germany
- William La Cava, University of Pennsylvania, Philadelphia, PA, USA
- Arnaud Liefoghe, University of Lille, Lille, France
- Manuel López-Ibáñez, University of Manchester, Manchester, UK
- Boris Naujoks, Technical University of Cologne, Köln (Cologne), Germany
- Pietro S. Oliveto, University of Sheffield, Sheffield, UK
- Patryk Orzechowski, University of Pennsylvania, Philadelphia, PA, USA
- Mike Preuss, LIACS, Leiden University, Leiden, The Netherlands
- Jérémy Rapin, Facebook AI Research, Paris, France
- Ofer M. Shir, Tel-Hai College and Migal Institute, Israel
- Olivier Teytaud, Facebook AI Research, Paris, France
- Heike Trautmann, University of Münster, Münster, Germany
- Ryan J. Urbanowicz, University of Pennsylvania, Philadelphia, PA, USA
- Vanessa Volz, modl.ai, Copenhagen, Denmark
- Markus Wagner, The University of Adelaide, Adelaide, Australia
- Hao Wang, LIACS, Leiden University, Leiden, The Netherlands
- Thomas Weise, Institute of Applied Optimization, Hefei University, Hefei, China
- Borys Wróbel, Adam Mickiewicz University, Poland
- Aleš Zamuda, University of Maribor, Maribor, Slovenia



Hosting Event

**Sixteenth International Conference on Parallel Problem Solving from Nature (PPSN XVI)
September 5-9, 2020, Leiden, The Netherlands**

<https://ppsn2020.liacs.leidenuniv.nl/>

The Sixteenth International Conference on Parallel Problem Solving from Nature (PPSN XVI) will be held in Leiden, The Netherlands on September 5-9, 2020. Leiden University and the Leiden Institute of Advanced Computer Science (LIACS) are proud to host the 30th anniversary of PPSN.

PPSN brings together researchers and practitioners in the field of Natural Computing, the study of computing approaches which are gleaned from natural models. The field includes, but is not limited to, areas such as Amorphous Computing, Artificial Life, Artificial Ant Systems, Artificial Immune Systems, Artificial Neural Networks, Cellular Automata, Evolutionary Computation, Swarm Computing, Self-Organizing Systems, Chemical Computation, Molecular Computation, Quantum Computation, Machine Learning and Artificial Intelligence approaches using Natural Computing methods.

PPSN XVI will feature workshops and tutorials covering advanced and fundamental topics in the field of Natural Computing, as well as algorithm competitions. The keynote talks will be given by the world-renowned researchers in their fields.

Following PPSN's unique tradition, all accepted papers will be presented during poster sessions and will be included in the proceedings. The proceedings will be published in the Lecture Notes in Computer Science (LNCS) series by Springer. Prospective authors are invited to contribute their high-quality original results in the field of natural computation as papers of no more than 12 pages plus references. The format follows Springer Verlag LNCS style.

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