Good Benchmarking Practices for Evolutionary Computation BENCHMARK @ GECCO

https://sites.google.com/view/benchmarking-network/home/activities/GECCO20

see also **http://iao.hfuu.edu.cn/benchmark-gecco20**

Submission Deadline: April 17th, 2020

to be held as part of the Genetic and Evolutionary Computation Conference (GECCO 2020)

July 8-12, 2020, Cancún, Quintana Roo, Mexico, organized by ACM SIGEVO

https://gecco-2020.sigevo.org

SCOPE AND OBJECTIVES

Benchmarking aims to illuminate the strengths and weaknesses of algorithms regarding different problem characteristics. To this end, several benchmarking suites have been designed which target different types of characteristics.

Gaining insight into the behavior of algorithms on a wide array of problems has benefits for different stakeholders. It helps engineers new to the field of optimization find an algorithm suitable for their problem. It also allows experts in optimization to develop new algorithms and improve existing ones.

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 small and do not cover the space of meaningful problems,
(ii) benchmarking suites lack the complexity of real-world problems,
(iii) proper statistical analysis techniques that can easily be applied depending on the nature of the data are lacking or seldom used, and
(iv) user-friendly, openly accessible benchmarking techniques and software need to be developed and spread.

We wish to enable a culture of sharing to ensure direct access to resources as well as reproducibility. This helps to avoid common pitfalls in benchmarking such as overfitting to specific test cases. We aim 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.

WORKSHOP DESCRIPTION

As the goal of the workshop is to discuss, develop and improve benchmarking practices in evolutionary computation, we particularly welcome informal position statements addressing or identifying open challenges in benchmarking, as well as all other suggestions and contributions for a discussion. Possible contributions include, but are not limited to:

- lists of open questions/issues in benchmarking
- examples of good benchmarking
- descriptions of common pitfalls in benchmarking and how to avoid them.

For all other information about the workshop, please contact Thomas Weise at tweise@ustc.edu.cn with CC to p.oliveto@sheffield.ac.uk, lacava@upenn.edu, boris.naujoks@th-koeln.de, and vanessa@modl.ai.

We also welcome the submission of workshop papers to be published in the GECCO companion proceedings. The Workshop Call for Papers (CfP) can be downloaded in PDF format or as plain text file here: https://sites.google.com/view/benchmarking-network/home/activities/GECCO20

Our goal for the WORKshop is to collaboratively produce output that improves the state-of-the-art of benchmarking in evolutionary computation, not to organize yet another mini-conference!

This workshop is organized as part of ImAppNIO Cost Action 15140.

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TOPICS

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

- the selection of meaningful (real-world) benchmark problems,
- performance measures for comparing algorithm behavior,
- novel statistical approaches for analyzing empirical data,
- 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.

IMPORTANT DATES

Paper Submission Opening:	27 February	2020
Paper Submission Deadline:	**17 April**	**2020**
Decisions Due:	1 May	2020
Camera-Ready Material Due:	8 May	2020
Author Registration Deadline:	11 May	2020
Conference Presentation:	8-9 July	2020

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SUBMISSION INSTRUCTIONS

All relevant instructions regarding paper submission are available at https://gecco-2020.sigevo.org/index.html/tiki-index.php?page=Workshops.

RELATED EVENT

A similar benchmarking best practices workshop will be held at PPSN 2020, which takes place from September 5-9, 2020, in Leiden, The Netherlands: https://sites.google.com/view/benchmarking-network/home/activities/PPSN20. Contributions to this workshop are welcome in any format until June 8, 2020.

LIST OF ORGANIZERS (alphabetical order)

- Thomas Bäck, Leiden University, Leiden, The Netherlands
- Carola Doerr, CNRS and Sorbonne University, Paris, France
- Tome Eftimov, Jožef Stefan Institute, Ljubljana, Slovenia
- Pascal Kerschke, University of Münster, Münster, Germany
- William La Cava, University of Pennsylvania, Philadelphia, PA, USA
- 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, Sorbonne University, Paris, France
- Thomas Weise, Institute of Applied Optimization, Hefei University, Hefei, China
- Borys Wróbel, Adam Mickiewicz University, Poland

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- Aleš Zamuda, University of Maribor, Maribor, Slovenia

<u>**HOSTING EVENT**</u>

The Genetic and Evolutionary Computation Conference (GECCO 2020)
July 8-12, 2020, Cancún, Quintana Roo, Mexico
http://gecco-2020.sigevo.org

The Genetic and Evolutionary Computation Conference (GECCO 2020) will present the latest high-quality results in genetic and evolutionary computation. Topics include genetic algorithms, genetic programming, evolution strategies, evolutionary programming, memetic algorithms, hyper-heuristics, real-world applications, evolutionary machine learning, evolvable hardware, artificial life, adaptive behavior, ant colony optimization, swarm intelligence, biological applications, evolutionary robotics, coevolution, artificial immune systems, and more. The full list of tracks is available at: https://gecco-2020.sigevo.org/index.html/Program+Tracks