What now?

Open issues in benchmarking

1. What we are doing
2. What should we be doing?

What we are doing:

Benchmarking Network

Consolidate + stimulate activities on benchmarking iterative optimization heuristics

- ● Organising events

- ● Sharing resources

- ● Place for discussion

Software	Topic	Programmin...
COCO	› Performance Assessment › Single-Objective › Multi-Objective › Test Problems › Continuous Optimization	› C › C++ › Java › Python › MATLAB › Octave
DEAP	› Single-Objective › Multi-Objective › Continuous Optimization › Discrete Optimization › Performance Assessment › Test Problems	› Python
ECJ	› Single-Objective › Multi-Objective › Continuous Optimization	› Java
ecr	› Single-Objective › Multi-Objective › Performance Assessment › Continuous Optimization › Discrete Optimization	› R
EO	› Single-Objective › Continuous Optimization › Discrete Optimization	› C++
flacco	› Features › Single-Objective › Continuous Optimization	› R › Python › GUI

GECCO 2020

- Workshop: Good Benchmarking Practices for Evolutionary Computation (now)

- Tutorial: Benchmarking and Analyzing Iterative Optimization Heuristics with IOHprofiler (July 09 [16:10 - 18:00])

- Poster: Towards Realistic Optimisation Benchmarks: Early Results from a Questionnaire on the Properties of Real-World Problems (July 10 [17:40 - 19:20])

- Benchmarking Best Practice Survey Paper on arxiv: https://arxiv.org/abs/2007.03488

Questionnaire on Real-World Optimization Problems

- Optimization algorithms need to work well on real-world problems, but are developed and benchmarked using artificial ones

- **Goal:** Create new test problems for benchmarking optimization algorithms with properties of real-world problems
- **Question:** What are the properties of real-world optimization problems?

Survey initiated by the Benchmarking Problems Group at the MACODA workshop, Leiden, NL, Sept. 2019

Participate in the survey at
https://tinyurl.com/opt-survey

PPSN 2020

- Workshop: Good Benchmarking Practices for Evolutionary Computation

- Workshop: (Multimodal) Multi-Objective Optimization

- Workshop: Understanding Machine Learning Optimization Problems

- Tutorial: Exploratory Landscape Analysis

- Competition: Game Benchmark Competition

- Competition: Open Optimization Competition

Ongoing Initiatives (and who to contact)

- IEEE CIS Task Force on Benchmarking (Markus Wagner):

  https://cmte.ieee.org/cis-benchmarking/

- COST Action ImAppNIO Benchmarking working group (Pietro S. Oliveto):

  https://imappnio.dcs.aber.ac.uk/working-groups/working-group-3

- COST Action Proposal incl. benchmarking working group (Carlos M. Fonseca)

- Thematic Seminars - Dagstuhl, Lorentz Center (Carola Doerr, Pascal Kerschke)

FOGA 2021

16th ACM/SIGEVO Workshop on Foundations of Genetic Algorithms

FOGA 2021

September 6-8, 2021

Premier event to discuss

- Theoretical foundations of randomized search heuristics
- Suitable analysis frameworks
- Benchmarking aspects
- Connections between search heuristics and machine learning

Location:

Vorarlberg University of Applied Sciences (FHV)
Dornbirn, Austria

Website: https://www.fhv.at/foga2021

Submission deadline:	April 30, 2021
Author rebuttal phase:	June 1-7, 2021
Early-registration until:	July 14, 2021

What should we be doing?

Open Issues: Topics

- **Sharing** and **reproducing** benchmarking resources, tools and results

- **Characterising** and understanding problems (including unknown properties)

- Problem **coverage** / Overfitting to benchmarks

- **Analysis** of obtained results (including visualisation and statistical tests)

- **Relevance** for real-world problems + (theoretical) research questions

- **Performance measures** (especially multi-objective and unknown optima)

- **Usage** of Benchmarks

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