Common Goals of Benchmarking Studies

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Good Benchmarking Practice

Common interest to improve benchmarking

- No good resource available? WRONG!

- Benchmarking in Optimization: Best Practice and Open Issues
  - Thomas Bartz-Beielstein, Carola Doerr, Jakob Bossek, Sowmya Chandrasekaran, Tome Eftimov, Andreas Fischbach, Pascal Kerschke, Manuel Lopez-Ibanez, Katherine M. Malan, Jason H. Moore, Boris Naujoks, Patryk Orzechowski, Vanessa Volz, Markus Wagner, Thomas Weise
  - 10 chapters, 11/54 pages of reference
  - Available here: https://arxiv.org/abs/2007.03488

- Benchmarking Network: https://sites.google.com/view/benchmarking-network/

Common Goals of Benchmarking Studies

Visualization and Basic Assessment	Sensitivity of Performance	Performance Extrapolation	Theory-Oriented Goals	Benchmarking in Algorithm Development

Common Goals of Benchmarking Studies

Visualization and Basic Assessment

- G1.1 Basic Assessment of Performance and Search Behavior
- G1.2 Algorithm Comparison
- G1.3 Competition
- G1.4 Assessment of the Optimization Problem
- G1.5 Illustrating Algorithms' Search Behavior

Sensitivity of Performance

Performance Extrapolation

Theory-Oriented Goals

Benchmarking in Algorithm Development

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Sensitivity of Performance

- G2.1 Testing Invariances
- G2.2 Algorithm Tuning
- G2.3 Understanding the Influence of Parameters and Algorithmic Components
- G2.4 Characterizing Algorithms' Performance by Problem Features

Performance Extrapolation

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- G3.1 Performance Regression
- G3.2 Automated Algorithm Design, Selection, and Configuration

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Theory-Oriented Goals

- G4.1 Cross-Validation and Complementation of Theoretical Results
- G4.2 Source of Inspiration for Theoretical Studies
- G4.3 Benchmarking as Intermediary between Theory and Practice

Benchmarking in Algorithm Development

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Benchmarking in Algorithm Development

- G5.1 Code Validation
- G5.2 Algorithm Development