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Sampling strategies in automated algorithm configuration

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Stellingen

Behorende bij het proefschrift

Sampling Strategies in Automated Algorithm Configuration

1. The performance of automated algorithm configurators for running time optimisation of NP-hard problem solvers largely depends on the characteristics of the problem instances and configuration scenario, such that no single configurator outperforms others across all scenarios. (Chapter 3)
2. The default parameter values provided by developers of NP-hard problem solvers often encode valuable prior knowledge, which can be leveraged to improve the efficiency of configurators. (Chapter 4)
3. The empirical performance comparison of two NP-hard problem solvers does not require evaluating them on all instances of a set to reach a correct conclusion regarding the full set, and the selection of the subset of representative instances can rely on simple metrics. (Chapter 5)
4. The empirical performance comparison of two configurations of a single NP-hard problem solver does not require evaluating them on all instances of a set to reach a correct conclusion regarding the full set, but applying this to automated algorithm configuration is not straightforward. (Chapter 6)
5. Whilst the focus of automated artificial intelligence partly shifted towards machine learning-related applications and anytime algorithms, many questions surrounding the running time optimisation of NP-hard problem solvers are left to explore.
6. It is a mistake to underestimate the current applicability of older methods and focus on the latest breakthrough tools.
7. Benchmarking methods and comparing their performances require making numerous choices, which likely skew the results towards a specific conclusion. While other fields rely on cross-evaluation and validation of results, artificial intelligence often assumes that one evaluation provides sufficient evidence.
8. The computational cost of tuning and evaluating algorithms is largely overlooked, and the sustainability of these should be questioned and improved.
9. The world of research is still crippled with prejudice and hostile behaviours that can only be overcome with a lot of luck and perseverance.
10. Research is a social endeavour, it is not about having the right ideas, but about finding the right people to work with.

Marie Anastacio
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