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Algorithm design for mixed-integer black-box optimization problems with uncertainty

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Stellingen

Behorende bij het proefschrift

Algorithm Design for Mixed-Integer Black-Box Optimization Problems with Uncertainty

1. The art of optimization is a universal key that unlocks potential in a wide range of applications, transforming challenges into opportunities across disciplines.
2. The mathematical definition of a real-world problem is a fundamental prerequisite for the application of an optimization algorithm to this problem. *Chapter 3.*
3. Exploratory Landscape Analysis can be employed to quantify the similarity between optimization problems, thus allowing the identification of surrogate problems that closely mirror the complexity of real-world optimization problem landscapes. *Chapter 4.*
4. Tuning an optimization algorithm on surrogate optimization problems is an effective and efficient method to find specific parameter configurations for a computationally expensive real-world optimization problem. *Chapter 4.*
5. The performance of an optimization algorithm in solving a discretized continuous optimization problem depends on the level of discretization. *Chapter 5.*
6. Dynamic budget allocation methodologies that integrate uncertainty quantification can lead to more efficient use of computational resources. *Chapter 6.*
7. In practice, optimization is a perpetual endeavor, as there is always potential for improvement.
8. The effectiveness of learning systems is limited by the quality of the input data.
9. The objective determines the optimal solution.
10. The use of ever more sophisticated simulations and more complex algorithms leads to a growing demand for and consumption of resources.

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