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Analyzing black-box optimization algorithms - why and how?

Many real-world problems can only be solved through an iterative trial-and-error process, e.g., when simulations are required to assess the quality of possible configuration. Such black-box optimization problems are particularly common in engineering applications and in machine learning. However, black-box optimization algorithms are also used to solve problems that are not inherently black-box, as witnessed by local search algorithms, Simulated Annealing, and evolutionary algorithms applied thousandfold every day to solve hard combinatorial optimization problems.
In this short presentation, we will summarize different motivations to analyze black-box optimization algorithms by theoretical means.