The complexity of designing and implementing metaheuristics

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Optimization problems can be found in several real application domains such as engineering, medicine, mathematics, mechanics, physics, mining, games, design, and biology, among others. There exist several techniques to the efficient solving of these problems, which can be organized in two groups: exact and approximate methods. Metaheuristics are one of the most famous and widely used approximate methods for solving optimization problems. Most of them are known for being inspired on interesting behaviors that can be found on the nature, such as the way in which ants, bees and fishes found food, or the way in which fireflies and bats move on the environment. However, solving optimization problems via metaheuristics is not always a simple trip. In this paper, we analyze and discuss from an usability standpoint how the effort needed to design and implement efficient and robust metaheuristics can be conveniently managed and reduced.

Local solution

Metaheuristics

Optimal solution

Optimization problems

Approximation theory

Heuristic algorithms

Human computer interaction

Problem solving

Approximate methods

Design and implements

Meta heuristics

Optimal solutions

Optimization problems

Real applications

Optimization