Set covering problem resolution by Biogeography-Based Optimization Algorithm

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The research on Artificial Intelligence and Operational Research has provided models and techniques to solve many industrial problems. For instance, many real life problems can be formulated as a Set Covering Problem (SCP). The SCP is a classic NP-hard combinatorial problem consisting in find a set of solutions that cover a range of needs at the lowest possible cost following certain constraints. In this work, we use a recent metaheuristic called Biogeography-Based Optimization Algorithm (BBOA) inspired by biogeography, which mimics the migration behavior of animals in nature to solve optimization and engineering problems. In this paper, BBOA for the SCP is proposed. In addition, to improve performance we provide a new feature for the BBOA, which improve stagnation in local optimum. Finally, the experiment results show that BBOA is a excellent method for solving such problems.

Biogeography-Based Optimization Algorithm

Metaheuristics

Set Covering Problem

Algorithms

Artificial intelligence

Ecology

Heuristic algorithms

Industrial research

Problem solving

Biogeography-based optimization algorithms

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Set covering problem

Optimization