

Solving the Set Covering Problem Using the Binary Cat Swarm Optimization Metaheuristic

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Abstract : In this paper, we present a binary cat swarm optimization for solving the Set covering problem. The set covering problem is a well-known NP-hard problem with many practical applications, including those involving scheduling, production planning and location problems. Binary cat swarm optimization is a recent swarm metaheuristic technique based on the behavior of discrete cats. Domestic cats show the ability to hunt and are curious about moving objects. The cats have two modes of behavior: seeking mode and tracing mode. We illustrate this approach with 65 instances of the problem from the OR-Library. Moreover, we solve this problem with 40 new binarization techniques and we select the technical with the best results obtained. Finally, we make a comparison between results obtained in previous studies and the new binarization technique, that is, with roulette wheel as transfer function and V3 as discretization technique.

Keywords : binary cat swarm optimization, binarization methods, metaheuristic, set covering problem

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