

The set covering problem solved by the Black Hole Algorithm [El Problema de Cobertura de Conjuntos solucionado por el Algoritmo del Agujero Negro]

Soto R.

Crawford B.

Figueroa I.

Olivares R.

Olguin E.

The Set Covering Problem is a classical problem in combinatorial optimization that belongs to the Karp's 21 NP-hard problems, with many practical applications. In this paper, an approach based on Black Hole Algorithm is proposed to solve this problem. The black hole algorithm is a metaheuristic that is inspired by nature, especially by the black hole phenomenon in space. To improve the performance of metaheuristics are used repairing operator, which those solutions that violate the constraints, preprocessing accelerate the resolution of the problem, and transfer function and discretization function to adapts the solutions to a binary domains. We report interesting and competitive experimental results on a set of 45 instances preprocessed the Set Covering Problem.

© 2016 AISTI.

Black hole algorithm

optimization problem

set covering problem

Algorithms

Combinatorial optimization

Computational complexity

Gravitation

Information systems

Optimization

Stars

Black holes

Classical problems

Discretizations

Meta heuristics

Metaheuristic

Optimization problems

Repairing operators

Set covering problem

Problem solving