Solving 0/1 Knapsack Problem using Opposition-based Whale Optimization Algorithm (OWOA)

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ABSTRACT

The 0/1 Knapsack problem is one of the most popular real-world optimization problems that arise in searching space and finding the most optimum solution. Theoretically, the optimum solution problem of the 0/1 Knapsack requires suitable technique to explore the search space effectively. Practically, as many metaheuristic algorithms, Whale Optimization Algorithm (WOA) may fail in local optimum solution. This paper proposes Opposition-based Whale Optimization Algorithm (OWOA) to optimize solution problem in 0/1 Knapsack. The OWOA has been tested original WOA by using twenty cases of Knapsack problem and against other metaheuristic algorithms such as (CGMA) and HS-Jaya. The experimental results indicate a significant performance of the optimization solution and stabilization with minimal standard deviation value. This shows that the OWOA improved the original version WOA and has promising result in comparison with other existing algorithms.

KEYWORDS

0\1 knapsack; WOA; Whale Optimization Algorithm; Optimization; Metaheuristic; Real-World Optimization Problem

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