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PERFORMANCE EVALUATION OF ANT LION OPTIMIZATION AND PARTICLE SWARM OPTIMIZATION FOR UNCAPACITATED FACILITY LOCATION PROBLEM (UFLP)

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Abstract

The Uncapacitated Facility Location Problem (UFLP) is one of the widely studied discrete optimization problem due to its application in modelling and solving various real life problems. In UFLP, the minimum cost of connecting a facility with some demand points is being sought. Due to its NP-hard (nondeterministic polynomial time) nature and increasing complexity of the problem as the dimension increases, metaheuristic optimization algorithms have been proposed in solving them. In this paper, the performance of two successful and recent metaheuristic optimization algorithms (the Ant Lion Optimizer (ALO) and Particle Swarm Optimization (PSO)) which were applied to solving UFLP were evaluated and compared. The data set used for the experiments were obtained from OR-library (Operational Research Library) and the results shows that the algorithms were efficient in obtaining a minimum cost and minimize distance of travel to yield a better facility location. The performance of ALO algorithm when compared to PSO show much better results in terms of obtaining the minimum city-facility connection cost.