World Academy of Science, Engineering and Technology
International Journal of Computer and Information Engineering
Vol:9, No:12, 2015

Discrete Group Search Optimizer for the Travelling Salesman Problem

Authors : Raed Alnajjar, Mohd Zakree, Ahmad Nazri

Abstract : In this study, we apply Discrete Group Search Optimizer (DGSO) for solving Traveling Salesman Problem (TSP). The DGSO is a nature inspired optimization algorithm that imitates the animal behavior, especially animal searching behavior. The proposed DGSO uses a vector representation and some discrete operators, such as destruction, construction, differential evolution, swap and insert. The TSP is a well-known hard combinatorial optimization problem, which seeks to find the shortest path among numbers of cities. The performance of the proposed DGSO is evaluated and tested on benchmark instances which listed in LIBTSP dataset. The experimental results show that the performance of the proposed DGSO is comparable with the other methods in the state of the art for some instances. The results show that DGSO outperform Ant Colony System (ACS) in some instances whilst outperform other metaheuristic in most instances. In addition to that, the new results obtained a number of optimal solutions and some best known results. DGSO was able to obtain feasible and good quality solution across all dataset.

Keywords : discrete group search optimizer (DGSO); Travelling salesman problem (TSP); Variable neighborhood search(VNS)
Conference Title : ICCEIT 2015 : International Conference on Computer Engineering and Information Technology
Conference Location : Melbourne, Australia
Conference Dates : December 13-14, 2015