

New Heuristic to Optimize the Travelling Salesman Problem

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One of the fundamental combinatorial problems is the Travelling Salesman Problem (TSP) where a salesman is invited to visit all cities with the cheapest cycle. To solve this problem, we designed in [1] a new column row heuristic entitled Dhoub-Matrix-TSP1 (DM-TSP1).

DM-TSP1 is characterized by its rapidity to generate an initial basic feasible solution after just n simple iterations where n is the number of cities. Also, DM-TSP1 is branded by its flexibility to use different statistical metrics such as Sum, Min, Range, Standard Deviation, Q1, Q3 etc. Furthermore, inspired from DM-TSP1 we designed in [2, 3] a new stochastic heuristic named Dhoub-Matrix-TSP2, a new iterated metaheuristic in [4] and a new multi-start metaheuristic in [5].

Moreover, DM-TSP1 is used to solve TSP under uncertain environment. The triangular fuzzy TSP is solved in [6], the trapezoidal fuzzy is nicely optimized in [7] and the octagonal fuzzy is easily solved in [8]. Additionally, DM-TSP1 is enhanced to solve the TSP with neutrosophic domain in [9, 10]. DM-TSP1 is developed under Python programming language and Figure 1 illustrates graphical representation of the optimal solution generated by DM-TSP1.

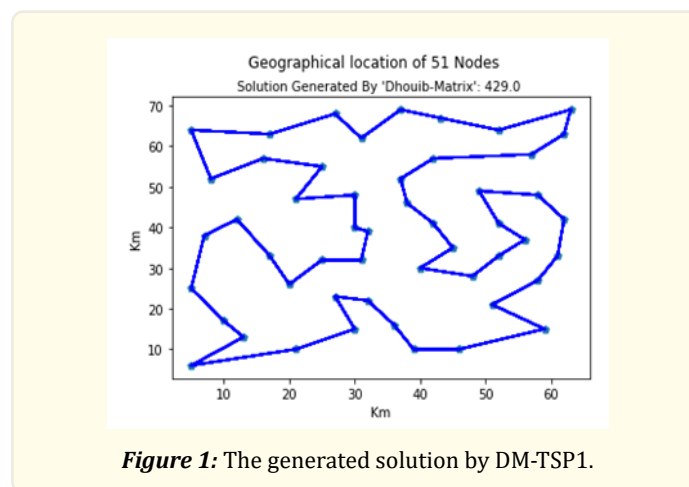


Figure 1: The generated solution by DM-TSP1.

Keywords

Operational Research; Combinatorial Optimization; Travelling Salesman Problem; Artificial Intelligence; Heuristic; Dhoub-Matrix; Dhoub-Matrix-TSP1

Abbreviations

DM-TSP1: Dhoub-Matrix-TSP1

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