DETERMINING A SHORTEST PATH FOR TRAVELLING SALESMAN PROBLEM USING IMPROVED NODE SELECTION CRITERION

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Shortest Path Problem is a highly regarded problem in science and engineering. It is represented using a network, and usually, the weight of each edge of the network represents the distance between two adjacent points. In the real world, distances between two locations are not fixed due to the availability of alternative routes between the points. In 2017, Sumarni Abu Bakar and Milbah Ibrahim developed an algorithm to find the optimal solution to Travelling Salesman Problem with imprecise arc lengths. In this study, this algorithm was extended and improved with a new node selection criterion. Our extensive numerical study shows that the proposed algorithm has provided an improved solution with a reasonable computational time. The strength of the proposed algorithm was tested with a real-world problem, and the findings were compared with the existing algorithm. It can be concluded that the proposed algorithm is proven to be better with respect to objective value as well as computational time.

Keywords: Deterministic algorithm, Heuristic algorithm, Imprecise arc lengths, Shortest path problem, Traveling salesman problem