Towards Solving Travelling Salesperson Problem using Hybrid of Genetic Algorithm and Lin-Kernighan Algorithm: A Comparative Evaluation with Neural Network Model

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Authors:
Samuel A. Oluwadare, Bosede A. Ogunsanmi, John C. Nwaiwu

Abstract

Travelling salesperson problem involves the sales person who intends to find the minimum or shortest round trip that passes through a finite set of cities, exactly once at minimum cost. This problem belongs to the class of optimization problems which is described as non-deterministic polynomial hard, that is, it cannot be solved in exact polynomial time. Several approaches have been employed in solving the problem, but empirical results has shown that these approaches needs more optimization in terms of run time and quality of getting the optimum solution. Genetic algorithm combined with another local search algorithm shows more efficient result could be obtained. In this paper, hybridization of genetic algorithm with a local search algorithm called Lin-Kernighan algorithm is employed to provide efficient solution. A case study of finding the optimal solution for a tour of state capitals in Southern Nigeria is carried out. The model is implemented on Intel Celeron 2GHz, 1GB RAM machine with JAVA programming language and Wamp server. The performance of the proposed hybrid genetic algorithm-based model is compared with Artificial Neural Network. The results showed that the proposed model performs
better than neural network in terms of run-time and minimal tour distance.

References


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Index Terms

Computer Science Algorithms

Keywords

Travelling salesperson problem, Genetic algorithm, Lin-Kernighan algorithm, Neural network, Optimal solution