

DNA Algorithm Employing Temperature Gradient for Multiple Traveling Salesperson Problem

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ABSTRACT

The biological Deoxyribo Nucleic Acid (DNA) strand is found to be a promising computing unit. An attempt has been made to solve symmetric Multiple Travelling Salesperson Problem (MTSP) with single depot using DNA. In this paper, the thermodynamic properties of DNA have been utilized along with other bio-chemical operations to obtain the optimal solution. Actual distance values are possible to be represented using the thermodynamic properties of DNA. Moreover, the proposed approach can be adopted in solving more real-life applications like Vehicle Routing problems and Scheduling problems, with necessary modifications. In this work, an instance with seven cities and three salespersons is solved using DNA computing. This method exhibits the ability to solve NP-complete problems using molecular computing.

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