

混合随机量子鲸鱼优化算法求解 TSP 问题

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摘要：为克服基本鲸鱼优化算法(WOA)解决 TSP 问题时收敛精度低、容易陷入局部最优的缺陷，本文借鉴量子计算思想提出了四种算法改进方案，并进行了基于 TSP 标准测试实例的仿真实验及与文献中其他算法的对比分析.研究发现，在解决 TSP 问题时混合随机量子鲸鱼优化算法（HSQWOA）收敛精度更高、全局搜索能力更强，能够跳出局部最优，具有更加优越的性能.

关键词： TSP 问题；鲸鱼优化算法（WOA）；量子计算；2-opt；混合算法

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Hybrid Stochastic Quantum Whale Optimization Algorithm Solving Travelling Salesman Problem

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Abstract: To overcome whale optimization algorithm's disadvantages of poor convergence and being easily trapped in local optima in solving travelling salesman problem, this paper proposed 4 schemes to improve the algorithm based on the idea of quantum computation. Then this paper provided comparative analysis on different schemes and algorithms based on a set of TSP benchmark instances. Simulation results show that the proposed hybrid stochastic quantum whale optimization algorithm (HSQWOA) has the merits of higher convergence accuracy, higher local optima avoidance and better exploration in solving travelling salesman problem.

Key words: travelling salesman problem; whale optimization algorithm; quantum computation; 2-opt; hybrid algorithm

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