

旅行商问题的一种高效近似算法及其排考应用

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摘 要: 要为解决现实应用中的类似于小规模旅行商问题的组合优化问题, 提出了一种新的近似算法——群体竞争搜索算法(PCS). 使用了一种新的局部搜索算子 $2e/1p-opt$, 并按照“搜索-选优-变异-搜索”的迭代策略设计了群体竞争搜索算法. 与 CLK 算法进行了比较, 对于 280 城市以下的旅行商问题, 在计算速度和计算结果两方面都有较好表现. 将高校排考中的场次排序优化问题转化为 TSP 并用算法求解, 能在 1 秒内得到大幅改进的结果.

关键词: 旅行商问题; 局部搜索; 群体进化算法; 排考

An Efficient Approach for Small-scale TSP and its

Application in Examination Timetabling

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Abstract: To solve the practical combinatorial optimization problem similar to small-scale TSP, an efficient algorithm named Population Competitive Search(PCS) is presented. A new local search operator named $2e/1p-opt$ is used, and t algorithm is designed based on the iterative strategy of “search-select-mutate-search”. Compared with CLK on TSP instances witch city numbers not more than 280, PCS has better performance in speed and results. PCS is applied for examination timetabling and achieves greatly improved results in 1 second.

Key words: travelling salesmen problem; local search; evolutionary algorithms; examination timetabling

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