动态调度策略与竞争机制融合的蚁群优化算法

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摘　要：针对蚁群算法收敛速度较慢与易陷入局部最优的问题，提出了动态调度策略与竞争机制融合的蚁群优化算法.该算法重点引入调度策略，随迭代时期的变化，通过反馈系数将路径信息实时反馈给调度算子，引导蚂蚁动态选择路径，在广阔的空间中充分探索最优解，避免蚁群陷入局部最优.另将蚁群分为双子群竞争搜索最优解，并给予不同的激励，从而平衡算法的多样性与收敛速度.通过 14 个经典旅行商问题（Traveling Salesman Problem）实例进行验证，该算法能以较少的迭代次数取得最优解或接近最优解，表明算法的有效性及其优越性.

关键词：动态调度策略；竞争机制；反馈系数；调度算子；激励函数；蚁群优化算法

Ant colony optimization algorithm based on dynamic scheduling strategy and competition mechanism

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Abstract：Aiming at the problem that the ant colony algorithm has slow convergence speed and easy to fall into local optimum， an ant colony optimization algorithm combining dynamic scheduling strategy and competition mechanism is proposed. The algorithm focuses on introducing the scheduling strategy. The algorithm focuses on introducing the scheduling strategy，with the change of the iteration period， the path information is fed back to the scheduling operator in real time through the feedback coefficient， guiding the ants to dynamically select the path， and fully exploring the optimal solution in the broad space to avoid the ant colony falling into the local optimum. In addition， the ant colony is divided into two sub-group competitive search optimal solutions， and different incentives are given to balance the diversity and convergence speed of the algorithm. The algorithm is verified by 14 examples of Traveling Salesman Problem， the algorithm can obtain the optimal solution or the near optimal solution with fewer iterations， indicating the effectiveness and superiority of the algorithm.

Key words：dynamic scheduling strategy; competition mechanism; feedback coefficient; scheduling operator; incentive function; ant colony optimization algorithm

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