

基于模式搜索法的鸡群优化算法

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摘要: 针对标准的鸡群容易陷入局部最优的缺陷, 提出一种基于模式搜索的鸡群算法. 在算法的每次迭代中加入对最优解的检测判断, 当发现该解多次出现不变时, 认为算法陷入局部最优, 引入模式搜索帮助算法跳出局部最优解; 利用算法全局最优解和全局次优解之间的差分结果牵引每次迭代中的最优解进行邻域搜索, 在保证算法收敛精度的同时, 提高收敛速度. 通过对 6 个典型的基准测试函数的仿真表明, 改进算法具有较强的全局搜索能力, 同时寻优精度和收敛速度比原算法也有较大的提高. 尤其是在处理高维函数问题上, 改进算法表现出了较强的优势.

关键词: 鸡群算法; 模式搜索; 差分结果; 局部搜索

A Chicken Swarm Algorithm Based on Hooke-Jeeves

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Abstract: A Chicken Swarm Optimization based on Hooke-Jeeves(HJCSO) was proposed to solve the defect that traditional Chicken Swarm Optimization(CSO) is easy to fall into local optimum. In the iteration of the algorithm, the examination and judgment of the optimal solution was added. When it was found that the solution remained unchanged many times, the algorithm was considered to be locally optimal. Hooke-Jeeves algorithm was introduced to help the algorithm to jump out of the local optimum. The differential results between the global optimal solution and the global suboptimal solution was used to drag the optimal solution in each iteration for neighborhood search. When it comes to the convergence precision of the algorithm is guaranteed, the convergence speed is improved. The results on five typical standard test functions show that the improved CSO not only improves the global search ability, but also the search efficiency, search accuracy and convergence rate are better than the traditional CSO. Especially in dealing with high-dimensional function problems, the improved HJCSO shows a strong advantage.

Key words: chicken swarm optimization; hooke-jeeves; differential results; local search

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