基于模拟退火的改进鸡群优化算法

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摘　要：针对鸡群算法因小鸡粒子易陷入局部最优而无法取得全局最优解问题，在小鸡粒子位置更新中加入自身惯性权重和向子群中公鸡粒子学习部分，提出具有随机惯性权重和固定学习因子的改进鸡群算法，然后用模拟退火算法对改进鸡群算法陷入停滞状态时已得到的最优解进行邻域搜索，使算法具有跳出局部最优取得全局最优解的能力，最后将基于模拟退火的改进鸡群算法用于 4 个标准测试函数寻优.仿真结果表明，基于模拟退火的改进鸡群算法全局搜索能力强，收敛速度快,精度高,与粒子群算法、鸡群算法以及改进鸡群算法相比寻优性能更佳.

关键词：模拟退火；鸡群算法；惯性权重；学习因子

The Study of Improved Chicken Swarm Optimization Algorithm based on Simulated Annealing

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Abstract：The part of chicks learning from the rooster in their subgroup is added to chick’s position update equation, and the inertia weight and learning factor are introduced, put forward an improved chicken swarm optimization algorithm with the random inertia weight and fixed learning factors to deal with the chicken particles into local optimum easily and can’t obtain the global optimal solution in the chicken swarm optimization algorithm, then using simulated annealing algorithm search in the field for the optimal solution when chicken swarm optimization to a standstill, makes the algorithm has the capacity of jumping out of local optimal to obtain the global optimal solution, finally, the improved chicken swarm optimization algorithm based on simulated annealing was tested by four classic functions. The simulation results show that the proposed algorithm have strong capability of global search, high convergence precision and fast convergence speed, the proposed algorithm whose performance of global searching was superior to particle swarm optimization, chicken swarm optimization and improved chicken swarm optimization.

Key words：simulated annealing; chicken swarm optimization; inertia weight; learning factor

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