基于聚集度的异化磷虾群算法

刘　楷，沈菊红，万仁霞，李延延

（北方民族大学 数学与信息科学学院，宁夏 银川 750021）

摘　要：针对标准磷虾群算法存在着不易跳出局部寻优、搜索精度低等问题，提出了一种基于聚集度的异化磷虾群算法.本算法根据种群多样性指标聚集度的变化，通过在两个相反位置移动方向的选择策略来增加磷虾进化多样性，同时引入了随机数策略来模拟磷虾的外部扰动，从而取代原磷虾群算法中的随机扩散运动的影响.再引入平均距离指标来增加局部搜索的变异概率，同时将背向最优位置的速度方向作为搜索变异方向，从而扩大了群体的搜索空间，保证算法的全局搜索能力.通过对九个典型不同类型的基准函数进行实验测试，结果表明了改进策略对算法的全局搜索能力和优化精度有很大的提高，能达到更好的收敛速度和寻优精度.

关键词：磷虾群算法；异化；聚集度；变异策略

The Dissimilated Krill Herd Algorithm with Aggregation Degree

LIU Kai, SHEN Ju-hong, WAN Ren-xia, LI Yan-yan

（Beifang University of Nationalities, Yinchuan 750021, China）

Abstract：In view of shortcomings of the basic krill herd algorithm (KH)--easily trapping in local optimization and low search accuracy, a dissimilated krill herd algorithm with aggregation degree is proposed in this paper. According to the variation of concentration (which plays as the diversity criterion of population), the algorithm increases the krill's evolving diversity by a selection strategy on two opposite directions, moreover, a random number strategy is introduced to simulate the external disturbance of krill, which actually takes the place of the influence of stochastic diffusion movement of original krill herd algorithm, and then the average distance index is used to increase the dissimilation probability of local search. Also the proposed algorithm takes the reverse of optimal position as the dissimilation search direction to expand the search space of the group, so that it can ensure a satisfied the global search ability. The experimental results show that the dissimilation strategy can gain the promising availabilities of the optimization accuracy and the global search ability.

Key words：krill herd algorithm (KH); dissimilated; aggregation degree; dissimilation strategy

作者简介：

刘　楷　女，（1991-），硕士研究生.研究方向为应用统计、智能计算等.

沈菊红　女，（1970-），副教授，硕士生导师.研究方向为支持向量机、应用统计、最优化理论等.

万仁霞（通讯作者)　男，(1975-)，博士，副教授，硕士生导师.研究方向为智能计算、数据挖掘、模式识别等.

Email：wanrx1022@126.com.

李延延　男，（1990-），硕士研究生.研究方向为数据挖掘与模式识别.