

自适应双层粒子群优化算法

周志勇, 李荣雨

(南京工业大学 计算机科学与技术学院, 江苏 南京 211816)

摘要: 针对粒子群优化算法(PSO)在解决复杂问题时存在着早熟收敛和进化后期收敛速度较慢的问题, 提出一种自适应双层粒子群优化算法(ADLPSO).在每次种群迭代时, 利用双层粒子群中的记忆群体向全局最优位置靠近的特性, 通过改进的粒子群更新公式更新记忆群体.同时为提高群体的多样性, 对惯性权重进行自适应调整, 并令自适应过程和双层粒子群的更新同步进行.仿真结果表明 ADLPSO 算法能够快速得到更优解.

关键词: 粒子群优化; 双层粒子群; 自适应; 惯性权重

Adaptive Double Layers Particle Swarm Optimization Algorithm

ZHOU Zhi-yong, LI Rong-yu

(College of computer science and technology, Nanjing Tech University, Nanjing 211816, China)

Abstract: The particle swarm optimization (PSO) has some shortcomings, such as premature convergence and low convergence speed in the late evolutionary. An improved algorithm is proposed which is Adaptive Double Layer Particle Swarm Optimization algorithm(ADLPSO).In each population iteration, the algorithm takes advantage of the characteristic of memory swarm to tent to the global optimal position on double layer particle swarm, memory swarm being updated by using an improved the memory particle swarm update formula. At the same time, in order to improving the diversity of the population, it uses an improved adaptive adjustment strategy to update inertia weight and makes the adaptive process and the update of the double layer particle swarm synchronization. The experiment results show that that the new algorithm is more fast to find better solution.

Key words: particle swarm optimization; double layers; adaptive adjustment; inertia weight

作者简介:

周志勇 男, (1990-), 硕士研究生.研究方向为群体智能优化算法的研究及其应用.E-mail:15189828818@163.com.

李荣雨 男, (1977-), 教授.研究方向为工业系统的监控与优化控制.