

以度为规则的小世界粒子群算法

靳雁霞, 银 莉, 张晓闻, 张 鑫

(中北大学 计算机与控制工程学院, 山西 太原 030051)

摘 要: 针对粒子群算法快速收敛, 容易陷入局部最优的现象, 提出了一种以度为规则的小世界粒子群算法. 该算法将粒子群的分布引入小世界模型, 给小世界的随机连接赋予一个规则, 即将度最大的粒子和度最小的粒子进行连接, 使粒子之间充分交流, 避免了粒子之间信息交流不充分而出现的早熟收敛现象. 通过测试函数对其进行仿真实验, 实验结果表明, 以度为规则的小世界粒子群算法不易陷入局部最优, 能够更好地寻找最优解, 其性能优于传统的粒子群算法.

关键词: 粒子群; 小世界; 度; 多样性

A Small-World Particle Swarm Optimization with a Rule of Degree

JIN Yan-xia, YIN Li, ZHANG Xiao-wen, ZHANG Xin

(School of Computer Science and Control Engineering, North University of China, Taiyuan 030051, China)

Abstract: For fast convergence and prone to premature phenomenon of particle swarm optimization, proposed a small-world particle swarm optimization with a Rule of degree. The particle swarm distributions use the model of small world network. Give a rule for small-world's random connection, the biggest degree connect to the smallest, making communication more effective between particles, avoiding rapid convergence and has a balance of diversity of particle swarm. Using the standard function to test it, the experimental results show that the particle swarm not easy to fall into local optimum and better finding optimal solution. A small-world particle swarm optimization with a rule of degree is better than the conventional particle swarm algorithm.

Key words: particle swarm; small-world; degree; diversity

作者简介:

靳雁霞 女, (1973-), 博士, 副教授. 研究方向为智能优化算法、虚拟现实技术.

银 莉 (通讯作者) 女, (1991-), 硕士研究生. 研究方向为智能优化算法. E-mail: 826082049@qq.com.

张晓闻 女, (1990-), 硕士研究生. 研究方向为智能优化算法.

张 鑫 男, (1994-), 硕士研究生. 研究方向为智能优化算法.