非线性权重和柯西变异的蝗虫算法

王　涛　1,2

(1 中国科学院 国家天文台南京天文光学技术研究所，江苏 南京 210042；
2 中国科学院 天文光学技术重点实验室（南京天文光学技术研究所），江苏 南京 210042）

摘　要：针对蝗虫优化算法收敛速度慢，易陷入局部最优等问题，提出一种基于非线性权重和柯西变异的蝗虫优化算法.首先使用佳点集初始化种群，均匀种群分布.然后将线性权重改进为非线性权重，提高勘探和开发能力.同时对最优个体采用柯西变异，增加跳出局部最优能力.最后通过 6 个基准函数进行测试，实验表明改进后蝗虫算法收敛速度快、精度高.

关键词：蝗虫优化算法；佳点集；非线性权重；柯西变异；勘探；开发

Grasshopper optimization algorithm with nonlinear weight and cauchy mutation

WANG Tao　1,2

(1 National Astronomical Observatories/Nanjing Institute of Astronomical Optics & Technology,ChineseAcademy of Sciences, Nanjing 210042, China；2 CAS Key Laboratory of Astronomical Optics & Technology,Nanjing Institute of Astronomical Optics & Technology, Chinese Academy of Sciences,Nanjing 210042,China)

Abstract：To overcome the problems of slow convergence, falling into local optima of the standard grasshopper optimization algorithm, a nonlinear weight and cauchy mutation in grasshopperoptimization algorithm is proposed. Firstly, the good point set is applied to initial population and uniform population distribution.Then the linearlyweightis improved to a nonlinear weight toenhance the exploration and exploitation capabilities of thegrasshopper optimization algorithm.At the same time, the cauchy mutation is added to the best grasshopper to increase the ability to jump out of local optima.Finally, six benchmark functions are selected for testing. Experiments show that the improved algorithm has fast convergence and high precision.

Key words：grasshopper optimization algorithm; good point set; nonlinear weight; cauchy mutation; exploration;exploitation

作者简介：
王　涛 男，(1992-)，硕士，助理研究员.研究方向为图像处理、数据处理、深度学习.E-mail：781036789@.qq.com.