非线性权重和收敛因子的鲸鱼算法

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摘　要： 针对鲸鱼优化算法收敛速度慢，收敛精度低等问题，提出一种基于非线性收敛因子和惯性权重的鲸鱼优化算法.首先使用改进后的 Logistic 混沌映射来初始化种群，增加种群多样性.然后将线性变化的收敛因子改进为一种分段式非线性收敛因子，同时增加了非线性惯性权重来增强算法的勘探和开发能力.最后选取 7 个基准函数进行测试，实验表明改进后算法收敛速度快、精度高.

关键词：鲸鱼优化算法；非线性收敛因子；非线性惯性权重；logistic 混沌映射；勘探；开发

Whale Optimization Algorithm with Nonlinear Weight and Convergence Factor

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Abstract：To overcome the problems of slow convergence, slow accuracy of the standard whale optimization algorithm, a nonlinear weight and a nonlinear convergence factor in whale optimization algorithm is proposed. Firstly, the improved Logistic chaotic mapping is applied to initial population. Then the linearly variable convergence factor is improved to a piecewise nonlinear convergence factor. At the same time, nonlinear inertia weights are added to enhance the exploration and exploitation capabilities of the whale optimization algorithm. Finally, seven benchmark functions are selected for testing. Experiments show that the improved algorithm has fast convergence and high precision.

Key words：whale optimization algorithm; nonlinear convergence factor; nonlinear inertia weight; logistic chaotic map; exploration; exploitation

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