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研究、探讨

一种新的改进粒子群优化方法

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摘要 为解决粒子群优化算法易于陷入局部最优问题，提出了两种新方法并行修改粒子群优化算法惯性权重：对好于或等于整体适应度平均值的粒子，用动态非线性方程调整惯性权重，在保存相对有利环境的基础上逐步向全局最优处收敛；对比平均值差的粒子，用动态Logistic混沌映射公式调整惯性权重，在复杂多变的环境中逐步摆脱局部最优，动态寻找全局最优值。两种方法前后相辅相成、动态协调，使两个动态种群相互协作、协同进化。实验结果证实：该算法在不同情况下都超越了同类著名改进算法。

关键词 粒子群优化算法 惯性权重 动态非线性方程 动态Logistic混沌映射公式

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New improved particle swarm optimizer

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Abstract

To solve the local-optima convergence problem of particle swarm optimization，two new methods are introduced to modify the Particle Swarm Optimization inertia weight in parallel：When particles' fitness values are better than or equal to the average，the introduced dynamic nonlinear equations are employed to modify the inertia weight，which can make particles retain favorable conditions and converge to the global optima continually；on the contrary，when fitness values are worse than the average，the dynamic Logistic chaotic map formula is introduced to modify the inertia weight，which can make particles break away from the local optima and search the global optima dynamically.Two methods coordinate dynamically，and make two dynamic sub-swarms cooperate to evolve.Experimental results demonstrate that the new introduced algorithm outperforms many other famous improved Particle Swarm Optimization algorithms on many well-known benchmark problems.

Key words Particle Swarm Optimization（PSO） inertia weight dynamic nonlinear equations dynamic Logistic chaotic map

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