一种改进的自适应惯性权重的粒子群算法

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摘　要：针对传统粒子群算法容易陷入局部最优、收敛速度快，导致收敛精度低等弊端，一种改良的自适应惯性权重的粒子群算法在本文中被提出.通过对粒子飞行速度和位置变化的分析，并结合粒子的自适应值动态调整惯权重，使得算法能够在全局空间和局部空间搜索之内达到良好的均衡.选择典型的测试函数，将改进后的粒子群算法（PSO-A）、带收缩因子的粒子群算法（PSO-X）和惯性权重线性递减粒子群算法（PSO-W）的性能进行了对比分析.最后采用 MATLAB 软件进行算法仿真，从结果得出，本文所提出的自适应改变惯性权重的粒子群算法在收敛精度、收敛速度上都取得了明显的改善.

关键词：粒子群算法；惯性权重；自适应；收敛精度

An improved particle swarm optimization algorithm for adaptive inertial weights

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Abstract：In view of the traditional particle swarm optimization (pso) algorithm convergence speed, it’s easy to fall into local optimum and cause disadvantages such as low convergence accuracy and it is not easy to converge, an improved particle swarm algorithm of adaptive inertia weight is proposed. Through the analysis of particle flying speed and position change, combined with the adaptive value of particles used to dynamically adjust the weight, enables the algorithm to the to achieve a good balance between global search and local search. Choosing typical test functions, the improved particle swarm optimization (PSO-A), with compression factor of particle swarm optimization (PSO-X)and inertia weight linear decreasing of the particle swarm optimization (PSO-W) performance is analyzed. Finally, MATLAB software is used for simulation. The results show that the improved particle swarm optimization algorithm has apparent improved its convergence speed and accuracy.

Key words：particle swarm optimization;inertia weight;adaptive;convergence accuracy

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