

## 一种平衡全局与局部搜索能力的粒子群优化算法

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**摘要:** 针对标准粒子群优化算法存在易陷入局部最优解、收敛速度慢等缺点, 从两个方面对算法进行改进. 一方面, 改变学习因子和惯性权重, 使学习因子和惯性权重随着粒子的适应度动态自适应变化, 以平衡局部和全局搜索能力; 另一方面, 增加粒子的学习对象, 从社会心理学出发, 提出向群体中所有比自身优秀的较优个体学习, 以增强社会学习能力. 与标准粒子群算法进行比较, 实验证明新算法具有更高的收敛效率、更快的收敛速度.

**关键词:** 粒子群优化算法; 粒子适应度; 局部搜索能力; 全局搜索能力

## A New Particle Swarm Optimization Algorithm with Balancing Local and Global Search Ability

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**Abstract:** Because of two disadvantages which are the premature convergence and slow searching of particles in the standard Particle Swarm Optimization(PSO), two aspects of improving algorithm are proposed. On the one hand, it changes the parameter's value of learning factor and Inertia weight by particle's fitness to balance particle's local and global search ability. On the other hand, it adds learned objects including all of particles finer than itself to improve social learning ability. Contrasted to standard PSO, the experimental result of some typical testing functions proves that the new algorithm has a higher convergence efficiency and faster search speed.

**Key words:** Particle Swarm Optimization algorithm; particle fitness; local search ability; global search ability

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