研究、探讨

基于分工合作和搜索空间重构的粒子群优化

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摘要　　针对粒子群算法早熟收敛及后期收敛速度慢的缺点，提出一种基于分工合作和搜索空间重构的改进粒子群算法。首先基于分工合作的思想，对不同性能的粒子赋予不同的惯性权值，从微观上提高粒子搜索效率；同时，每当种群迭代到一定次数时，对搜索空间进行自适应重构，从宏观上提高种群的后续搜索效率，并适度重新初始化种群，恢复种群多样性。以4个经典测试函数对算法性能进行了测试比较。仿真结果表明，该算法明显提高了收敛效率，改善了求解质量。

关键词　　粒子群算法　早熟　惯性权值　搜索空间

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Particle swarm optimizer based on particle-cooperation and search-space-reconfiguration

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Abstract

A particle swarm optimization based on particle-Cooperation and search-space-Reconfiguration（CRPSO） is proposed.Firstly，different inertia weights are given to particles with different fitness.Secondly，when iterating for some certain generations，a smaller search-space is reconfigured according to former one and positions of present particles.Then，the swarm is reinitialized to recover its diversity and the search is continued.The global optimization solution is obtained in the end.Both CRPSO and another typical PSO is tested by 4 widely used test functions' optimization problems.The experimental results indicate that CRPSO has better optimization performance on both precision and efficiency.

Key words　particle swarm optimization　premature convergence　inertia weight　search space

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