

研究、探讨

## 求多目标优化问题的粒子群优化算法

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**摘要** 将粒子群优化算法应用于求解多目标优化问题, 提出一种双向搜索机制, 指导粒子向着搜索空间中非劣目标区域以及粒子分布最为稀疏的区域这两个方向进行寻优, 进而提出了求解多目标优化问题的基于粒子群优化算法的双向搜索法, 该算法对粒子全局最优经验的选择策略以及粒子群的状态更新机制进行了改进。实验研究表明, 该算法不仅能快速有效地获得多目标优化问题的非劣最优解集, 而且求出的解集具有良好的分布性。

**关键词** [多目标优化](#) [粒子群优化算法](#) [双向搜索](#) [非劣最优解](#)

**分类号** [TP18](#)

## Particle swarm optimization for multi-objective programming problems

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### Abstract

Particle Swarm Optimization (PSO) is applied to solve Multi-Objective Programming (MOP) problems. First, a bidirectional searching strategy is proposed to guide each particle to search simultaneously in both the Pareto-optimal region and the region where particles are distributed sparsely. And then a bidirectional PSO based algorithm for solving MOP problems is put forward, which shifts the selection mechanism of the global optimum among all particles and updates the iteration manner of the whole swarm. The experimental studies show that the new algorithm can obtain effectively the Pareto-optimal sets of MOP problems, the distribution performance of which is improved as well.

**Key words** [multi-objective programming](#) [Particle Swarm Optimization \(PSO\)](#) [bidirectional search](#) [Pareto optimal](#)

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