

论文

一种基于边缘分布估计的多目标优化算法

李 斌, 钟润添, 肖金超, 庄镇泉

中国科学技术大学自然计算与应用实验室 合肥 230027

收稿日期 2006-5-15 修回日期 2007-1-30 网络版发布日期 2008-2-29 接受日期

摘要

该文提出了一种基于边缘分布估计的多目标优化算法, 通过在每一进化代中估计较优个体的边缘概率分布来引导算法对Pareto最优解的搜索。通过与基于拥挤机制的多样性保持技术、基于非支配排序的联赛选择、精英保留等技术的有机结合, 使得算法在具有良好收敛性能的同时, 具有很好的维持群体多样性的能力。通过一组典型测试函数实验对该算法的性能进行了分析, 并与NSGA-II、SPEA、PAES等知名多目标优化算法进行了比较, 结果表明该文算法收敛速度较快, 且得到的非支配解集分布均匀, 适合于复杂多目标优化问题的求解。

关键词 [多目标优化](#) [边缘分布估计](#) [非支配解](#) [多样性](#)

分类号 [TP18](#)

A Multi-Objective Optimization Algorithm Based on Marginal Distribution Estimation

Li Bin, Zhong Run-tian, Xiao Jin-Chao, Zhuang Zhen-quan

Lab. of Nature Inspired Computation and Application,
University of Science and Technology of China, Hefei 230027, China

Abstract

A new multi-objective optimization algorithm based on marginal distribution estimation is proposed, in which marginal probability distribution of the selected better individuals is estimated and is used to guide the search of Pareto optimal solutions of the multi-objective optimization problems. Combined with non-dominant ranking, diversity preserving technique based on crowding mechanism, tournament selection based on non-dominant ranking, and elitist strategy, the algorithm achieves a good balance between convergence and diversity. A set of typical test functions are used to evaluate the performance of the proposed algorithm, and comparison is made between some well-known multi-objective optimization algorithms, i.e. NSGA-II, SPEA, PAES. The experimental results show that the proposed algorithm can achieve a good balance between convergence and diversity, and is suited to complex multi-objective problems.

Key words [Multi-objective optimization](#) [Marginal distribution estimation](#) [Non-dominated solution](#) [Diversity](#)

DOI :

通讯作者

作者个人主页 李 斌; 钟润添; 肖金超; 庄镇泉

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF \(287KB\)](#)
- ▶ [\[HTML全文\]\(OKB\)](#)
- ▶ [参考文献\[PDF\]](#)
- ▶ [参考文献](#)

服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [复制索引](#)
- ▶ [Email Alert](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

相关信息

- ▶ [本刊中 包含“多目标优化”的 相关文章](#)
- ▶ 本文作者相关文章

- [李 斌](#)
- [钟润添](#)
- [肖金超](#)
- [庄镇泉](#)