

工程与应用

基于局部搜索和遗传算法的激光切割路径优化

李妮妮, 陈章位, 陈世泽

浙江大学 流体传动及控制国家重点实验室, 杭州 310027

收稿日期 2009-7-28 修回日期 2009-8-31 网络版发布日期 2010-1-20 接受日期

摘要 为了缩短激光加工时间, 提高加工效率, 提出了一种新的局部搜索法与遗传算法相结合的激光切割路径优化算法。该算法从加工轮廓中提取节点, 通过局部搜索法对节点进行局部路径优化, 再运用的遗传算法求得近似最优解, 遗传算法中的选择算子改进为基于相对适应度的轮盘赌选择算子。详细介绍了算法的原理及实现, 通过编程仿真证明该算法与传统的遗传算法相比具有良好的优化效果, 可明显缩短加工路径, 减少加工时间, 提高加工效率。

关键词 [局部搜索法](#) [遗传算法](#) [路径优化](#) [相对适应度](#)

分类号 [TP301](#) [TH164](#)

Optimization of laser cutting path based on local search and genetic algorithm

LI Ni-ni, CHEN Zhang-wei, CHEN Shi-ze

The State Key Lab of Fluid Power Transmission and Control, Zhejiang University, Hangzhou 310027, China

Abstract

To reduce the process time and improve the efficiency of laser cutting, a new combination algorithm of local search method and genetic algorithm for laser cutting path is proposed. Through local search method, the nodes extracted from the contour tool path have been optimized. Then the genetic algorithm has been used to achieve approximate optimal solution. The selection operator of genetic algorithm has been improved to be roulette operator based on relative fitness. The principle and implementation of algorithm is introduced in detail. Through simulation, the algorithm has been proved to have good results compared with traditional genetic algorithm, can significantly shorten the tool path, reduce the process time and improve process efficiency.

Key words [local search method](#) [genetic algorithm](#) [path optimization](#) [relative fitness](#)

DOI: 10.3778/j.issn.1002-8331.2010.02.069

通讯作者 李妮妮 lininl@sinacn.com

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(821KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [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“局部搜索法”的相关文章](#)
- ▶ [本文作者相关文章](#)

- [李妮妮](#)
- [陈章位](#)
- [陈世泽](#)