

短文

基于模糊控制的拉式策略在装配生产控制中的应用

莫巨华, 黄敏, 王兴伟

1. 东北大学信息科学与工程学院 沈阳 110004

2. 流程工业综合自动化教育部重点实验室(东北大学) 沈阳 110004

收稿日期 2008-7-28 修回日期 2010-3-17 网络版发布日期 接受日期

摘要

利用模糊控制鲁棒性强的特点, 将其引入单产品装配线的生产控制系统中, 构造新的拉式控制策略. 在建立控制系统周期审查模型和完成控制器设计的基础上, 通过缩小变异范围改进遗传算法求解以极小化在制品量和投放波动为目标, 顾客满意率为约束条件的多目标规划, 从而达到优化控制系统参数的目的. 为考察模糊控制系统性能, 通过实例与多阶段定量在制品法(Constant work-in-process, CONWIP)、Kanban和一般拉式策略 (Generic pull, GP) 系统进行比较, 结果表明模糊生产控制系统不仅能维持较低的在制品水平, 更重要的是能维持较低的订单投放波动水平.

关键词 [生产控制](#) [装配线](#) [模糊控制](#) [拉式控制](#) [投放波动](#)

分类号

Application of a Pull Strategy Based on Fuzzy Control for Production Control of Assembly Line

MO Ju-Hua, HUANG Min, WANG Xing-Wei

1. College of Information Science and Engineering, Northeastern University, Shenyang 110004

2. Laboratory of Integrated Automation of Process Industry (Northeastern University), Ministry of Education, Shenyang 110004

Abstract

Due to its robustness, fuzzy control has been incorporated into the production control system to establish a pull strategy for single-product assembly line. Based on a periodic review model proposed to describe the operations of the assembly control system and on the designs of the fuzzy controllers, the basic genetic algorithm (GA) has been improved via reducing mutation domains to solve a multi-objective program, which minimizes the work-in-process level and fluctuation level of order placement while meeting customer's demand, meanwhile, the parameters of the control system have been optimized. In order to investigate the performance of the proposed fuzzy control system, multi-CONWIP, Kanban and generic pull systems have been compared with the fuzzy system, and the results show that the fuzzy production control system keeps a lower work-in-process level, and especially a weaker placement fluctuation.

Key words [Production control](#) [assembly line](#) [fuzzy control](#) [pull control](#) [placement fluctuation](#)

DOI: 10.3724/SP.J.1004.2011.00118

通讯作者 莫巨华 Juhuamo@126.com

作者个人主页 莫巨华; 黄敏; 王兴伟

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF\(462KB\)](#)
- ▶ [\[HTML全文\]\(OKB\)](#)
- ▶ [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](#)

相关信息

- ▶ [本刊中 包含“生产控制”的 相关文章](#)
- ▶ 本文作者相关文章

- [莫巨华](#)
- [黄敏](#)
- [王兴伟](#)