

SYSTEM ENGINEERING

基于混合策略的预测控制不可行与约束优先级处理

王宇华¹, 黄德光², 余以慧³

¹ Department of Automation, Tsinghua University, Beijing 100084, China

² College of Information and Control Engineering, University of Petroleum, Dongying 257061, China

收稿日期: 修回日期 网络版发布日期 接受日期

摘要 A hybrid approach using MLD (mixed logical dynamical) framework to handle infeasibility and constraint prioritization issues in MPC (model predictive control) based on input-output model is introduced. By expressing constraint priorities as propositional logic and by transforming the propositional logics into inequalities, the infeasibility and constraint prioritization issues are solved in the MPC. Constraints with higher priorities are met first, and then those with lower priorities are satisfied as much as possible. This new approach is illustrated in the control of a heavy oil fractionator. Shell column. The overall control performance has been significantly improved through the infeasibility and control priorities handling.

关键词 网络控制策略 预测控制 混合工业 与产工业 石化工业 软件 优化方法 混合系统

DOI:

A Hybrid Model Predictive Control for Handling Infeasibility and Constraint Prioritization

WANG Yuhua¹, HUANG Deshan², YU Yihui³

¹ Department of Automation, Tsinghua University, Beijing 100084, China

² College of Information and Control Engineering, University of Petroleum, Dongying 257061, China

Received Revised Online Accepted

Abstract A hybrid approach using MLD (mixed logical dynamical) framework to handle infeasibility and constraint prioritization issues in MPC (model predictive control) based on input-output model is introduced. By expressing constraint priorities as propositional logics and by transforming the propositional logics into inequalities, the infeasibility and constraint prioritization issues are solved in the MPC. Constraints with higher priorities are met first, and then these with lower priorities are satisfied as much as possible. This new approach is illustrated in the control of a heavy oil fractionator-Shell column. The overall control performance has been significantly improved through the infeasibility and control priorities handling.

Key words model predictive control; feasibility; mixed logical dynamical system; priority; hybrid system

通讯作者: 王宇华 yuhua@sempry@mails.tspu.edu.cn

作者个人主页: 王宇华, 黄德光, 余以慧

扩展功能	
本文信息	
► Supplemental info	
► EML (PDF/XML)	
► HTML全文 (XML)	
► 中文摘要	
► 服务与反馈	
► 把本文推荐给好友	
► 加入我的收藏夹	
► 加入我的阅读列表	
► 打印本文	
► Email Alert	
► 广告服务	
► 期刊订阅服务	
► 相关信息	
► 本期刊: 点击“期刊订阅”的 按钮	
► 本文件者相关文章	
► 关键词	
► 引用	
► 高被引	
► 最新	