

过程系统工程

基于基因表达式编程的化工过程故障诊断知识抽取

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摘要

专家系统是化工过程故障诊断最常用的技术之一。专家系统的基础是专家知识, 而知识获取一直是专家系统的“瓶颈”问题, 所以知识提炼是开发化工过程故障诊断专家系统的关键技术。本文提出了一种基于基因表达式编程(GEP)的化工过程故障诊断知识的提取技术, 通过模糊函数对数据进行模糊化处理, 利用GEP演化特性从数据库中找出异常以及产生这些异常的原因, 从而获得用于故障诊断的知识规则。实际案例研究结果显示, 该技术与领域专家结合能有效提取故障诊断知识, 可作为化工过程故障诊断专家系统的知识获取手段。

关键词

[专家系统](#) [故障诊断](#) [基因表达式编程](#) [知识提取](#)

分类号

Extracting knowledge based on GEP for fault diagnosis of chemical processes

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Abstract

Expert system based on expert knowledge is one of the most common technologies in chemical fault diagnosis. Knowledge acquisition is the bottleneck of expert system, so knowledge extraction is the key technology of expert system. In this paper, an extracting knowledge technology based on gene expression programming (GEP) for fault diagnosis of chemical processes was presented. Fuzzy processing of the data was performed with the ambiguity function, and then from the database the anomalies and the reasons of these anomalies were identified by using GEP evolution properties. Therefore the knowledge rules were obtained which could be used in fault diagnosis. Practical case study showed that the technology combined with experts in the field could effectively extract fault diagnosis knowledge, and could be used as a knowledge acquisition tool in expert system for fault diagnosis of chemical processes.

Key words

[expert system](#) [fault diagnosis](#) [gene expression programming](#) [extracting knowledge](#)

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