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# 利用元件替换测试求诊断

李占山, 王 涛, 孙吉贵, 林 海, 冯果忱

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李占山<sup>1,2,3</sup>, 王 涛<sup>4</sup>, 孙吉贵<sup>1,2</sup>, 林 海<sup>1,2</sup>, 冯果忱<sup>2,3</sup>

1(吉林大学 计算机科学与技术学院, 吉林 长春 130012)

2(符号计算与知识工程教育部重点实验室(吉林大学), 吉林 长春 130012)

3(吉林大学 数学研究所, 吉林 长春 130012)

4(长春工业大学 计算机科学与工程学院, 吉林 长春 130012)

作者简介: 李占山(1966—), 男, 吉林公主岭人, 博士, 副教授, 主要研究领域为基于模型的诊断, 智能规划与决策及其应用; 王涛(1969—), 女, 讲师, 主要研究领域为基于模型的诊断及其应用; 孙吉贵(1962—), 男, 博士, 教授, 博士生导师, CCF高级会员, 主要研究领域为常识推理, 约束程序, 约束推理; 林海(1981—), 男, 助教, 主要研究领域为自动推理, 基于模型的诊断; 冯果忱(1935—), 男, 教授, 博士生导师, 主要研究领域为非线性问题解法, 计算机数学.

联系人: 李占山 Phn: +86-431-5166478, E-mail: zsli@email.jlu.edu.cn

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## Abstract

This paper mainly fills the gap of diagnosis test for non-observable common variables or high cost of testing common variables. The concept of replacement test is presented as a new alternative to diagnosis test. The concept of relevant replacement test is proposed for some observations, and makes best use of the effects of component replacement upon the observations of the system being diagnosed to characterize the discrimination of candidate diagnoses, and the generation of new conflicts. Based on it, the concept of replacing decomposition for diagnostic problems is proposed by virtue of the characteristics of replacement, and the decomposition of the system being diagnosed through replacing the components in the intersection set of some subsystems with normal components directly is investigated. In non-observable common variables or high cost of testing common variables, the results in this paper can improve the adaptation and the effectiveness of diagnosis tests, reduce the cost of the test, and provide a theoretical basis for decomposing the system being diagnosed.

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## 摘要

主要填补了对系统参量不可观测或观测成本高的诊断测试研究这一空白,提出了替换测试作为诊断测试一种新的可选择方法.在提出相关替换测试概念的基础上,利用元件替换对系统观测值的影响刻画了诊断的判定、新冲突的生成.在此基础上,提出了替换分解诊断问题的概念;刻画了诊断问题的替换分解等相关问题;研究了直接利用正常元件替换几个子系统交集元件分解待诊断系统的方法.其结果能够改善诊断与测试的效率、降低诊断成本,并为研究诊断问题分解提供理论依据.

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