自动化学报 (): ISSN: 0254-4156 CN: 11-2109/TP

[2010-0024]基于试验设计的RFID应用组合测试优化研究

刘禹,朱智源,关强,杨一平

收稿日期 修回日期 网络版发布日期 2010-6-24 接受日期

摘要
作为物联网的核心技术之一，RFID已广泛应用到多个行业中. 而复杂的应用环境和多样化的产品设备也给RFID应用部署带来了新的挑战. 为了解决RFID应用测试中的组合爆炸问题，本文提出一种RFID应用组合测试优化方法，可以在多因子多水平的条件下通过正交设计在所有试验方案中均匀地挑选出最具有代表性的少数试验方案来简化测试，并利用方差分析法获得各因子对测试结果影响的主次因素和变化规律，协助使用者迅速建立对输入输出关系的认识. 以RFID标签应用为例进行的组合测试数据分析表明，利用试验设计方法对RFID应用组合测试的设计方案进行优化，可以为RFID系统部署提供有益的参考依据.

关键词 RFID,组合测试,试验设计,多因子模型
分类号

The Research on DOE-based RFID Application Combinatorial Testing Optimization

LIU Yu ,ZHU Zhi-Yuan,GUAN Qiang,YANG Yi-Ping

Abstract
As a core technology of the Internet of Things, RFID technology prevails in many fields. However, the complexity of the actual application scenarios and the diversification of equipments have brought new challenges to RFID real-time deployment and on-site testing. To solve the problem of combinatorial explosion effectively, this paper proposes a combinatorial testing method for optimizing the RFID performance by experimental design. With the orthogonal design method under the conditions of multiple level and multiple factors, it helps users choose the representative test cases equably and simplify the tests, which is able to quickly set up the system model of inputs and outputs, and acquires main factors and patterns on the test results impacted by multiple factors. The case study on RFID tag performance combinatorial test shows that the combinatorial testing method is valid for optimizing the test cases in on-site RFID applications, it also provides useful reference to the deployment of RFID systems.

Key words RFID combinatorial test experimental design multiple-factor model

DOI:

通讯作者
作者个人主页 刘禹;朱智源;关强;杨一平