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基于研制信息的测试性验证试验方案研究

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Study on the Scheme of Testability Demonstration Test Based on Development Information

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摘要 | 参考文献 | 相关文章

摘要 针对现有测试性验证试验方案需要较大故障样本量的问题,提出了一种利用研制信息制定测试性验证试验方案的新方法。首先,在二项分布经典抽样模型的基础上,运用证据理论方法,研究了基于测试性试验数据、测试性预计结果和专家经验等研制信息的基本信任分配函数的构造方法,建立了基于融合不同种类研制信息的测试性验证试验方案,并确定了该方案的存在性,给出了方案的确定方法,最后开展了案例应用研究。由于充分考虑了研制信息,因此在确保有较好的验证效果的条件下,与传统的试验方案相比,该方法可以明显减少故障样本量,或在样本量保持不变的情况下有效降低双方风险。

关键词： 测试性验证试验 方案 分配函数 证据理论 故障样本量

Abstract: In view of the fact that the existing testability demonstration tests usually require a large fault sample size, a new method for determining the test scheme based on development information is proposed in this paper. Firstly, after analyzing the classical test model based on binomial distribution, a basic probability assignment is established by using a variety of development information, which includes testability test data, testability prediction result and expert experience. The proposed method is studied for determining a demonstration test scheme by applying the evidence theory, and the existence of the optimal test scheme is conformed. At the same time, a method is given to determine the test scheme. Finally, an example is provided to validate the new method. The result shows that this method can make full use of the testability development information and ensure good validation effect. Compared to traditional test scheme, this method can reduce the size of test fault samples and risk level with the sample size unchanged.

Keywords: testability demonstration test scheme distribution functions evidence theory fault sample size

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