

研发、设计、测试

一种改进的基于架构的软件可靠性模型

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收稿日期 2008-9-19 修回日期 2008-11-28 网络版发布日期 2009-12-4 接受日期

摘要 基于架构的软件可靠性分析往往把构件的可靠性当作自身固有不变的属性, 忽略了在不同的输入剖面下, 因构件所处的交互环境不同造成的实际可靠性的变化。改进了一种基于架构的可靠性模型, 引入转移目的构件剖面矩阵来建立系统操作剖面 and 构件可靠性的联系, 并给出了改进后的可靠性合成算法。实例分析表明, 该模型可以全面捕捉到在不同系统操作剖面下, 因构件之间转移概率和构件可靠度这两个参数的变化对整体可靠性产生的影响, 提高了系统设计阶段可靠性分析的精确性。

关键词 [构件软件](#) [软件可靠性](#) [基于架构的模型](#) [操作剖面](#)

分类号 [TP311](#)

Improved architecture-based software reliability model

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Abstract

Architecture-based software reliability analysis typically takes the reliability of component as an invariable property of component itself, while disregards the fact that it is changed when the component context that it interacts with is changed due to a different operational profile of the system. This paper aims at architecture-based software reliability model which is one type of approach modeling component-based software, introduces an input profile matrix of transition destination component to build a relationship between operational profile and the component reliability, and provides an improved composite algorithm to solve the model. The application analysis of a case study indicates that this model is able to fully capture the impact of different operational profiles on the system reliability in aspects of both model parameters, transition probability and component reliability. This ability will benefit reliability analysis of higher accuracy at the stage of system design.

Key words [component-based software](#) [software reliability](#) [architecture-based model](#) [operational profile](#)

DOI: 10.3778/j.issn.1002-8331.2009.33.019

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