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装配可靠性的动态贝叶斯网络建模与分析

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摘要:
为了提高产品的整机可靠性,提出了可靠性驱动的装配技术(reliability driven assembly technology,RDAT)的概念。根据可靠性要求,首先利用结构分析和设计技术(structured analysis and design technique,SADT)对所装配产品进行功能分析,得到“元动作”粒度的SADT模型。然后采用具有时间特性的动态贝叶斯网络对RDAT进行了建模,将“元动作”级别的SADT模型转化为相应的动态贝叶斯网络模型。最后以某加工中心的托盘交换架进行实例分析,在装配产品和功能动作为多态系统的情况下,验证了该建模与仿真方法的有效性。

关键词:
装配可靠性;动态贝叶斯网络;功能分析;多态系统

Modeling and Analysis for Assembly Reliability Based on Dynamic Bayesian Networks

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Abstract:
For improving the reliability of products,a reliability driven assembly technology(RDAT) was presented.According to the requirements of reliability, structured analysis and design technique(SADT) was firstly applied to functioning analysis,then the last level of SADT model could be obtained.The dynamic Bayesian networks(DBN) which can depict the time was applied to modeling for RDAT,the SADT model was converted to corresponding DBN model.At last, while the system and functional actions were multi-states,the pallet changer of some machining center was taken as an example to verify the effectiveness of the model and simulation analysis method.

Keywords: assembly reliability;dynamic Bayesian network;functioning analysis;multi-state systemzz')" href="#"> assembly reliability;dynamic Bayesian network;functioning analysis;multi-state system

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