工程与应用

贝叶斯网络在电子系统故障诊断中的应用研究

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摘要 电子系统大多结构复杂，各组成模块存在错综复杂、相互影响的关系，另外测点较少且测点数据常常是不完备的。针对此类情况，以某电源系统为研究对象，提出了基于贝叶斯网络的电子系统故障诊断方法。首先依据系统的结构获得其因果图，并对各测点信号进行离散化处理；其次建立用于故障诊断的贝叶斯网络模型，并且根据历史数据完成该网络的参数学习，最后利用获得的事实来实现故障的诊断。仿真结果验证了该方法的有效性，为电子系统的故障诊断提出了一种新的思路。

关键词 贝叶斯网络 故障诊断 参数学习

分类号

Study on fault diagnosis of electronic system using Bayesian network

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Abstract

Electronic systems often own complex structures，and their sub-modules are interactional and anfractuous.Furthermore number of testing nodes is usually less and the testing data are incomplete.Aiming at these circumstances，the paper presents a new fault diagnosis approach based on Bayesian network for an electronic power.Firstly based on the original structure of electronic power，authors gain cause-result graph and discretize all testing signals；then a Bayesian network is built for fault diagnosis and its parameters are studied through historical data；finally the Bayesian network is applied to diagnose true fault by using the actual data.Simulation experiments verify the effectiveness of the proposed approach，which provides a new way for fault diagnosis of electronic systems.

Key words Bayesian network fault diagnosis parameter studying

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