Proceedings of the 11th International Conference on Quality and Dependability
Sinaia, Romania, September 24th-26th, 2008
ISSN 1842-3566
Pages 65-71

Bayesian Network for the Characterization of Faults in a Multivariate Process

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Abstract
The main objective of this paper is to present a new method of detection and characterization with a bayesian network. For that, a combination of two original works is made. The first one is the work of Li et al. [1] who proposed a causal decomposition of the T^2 statistic. The second one is our previous work on the detection of fault with bayesian networks [2], [3], notably on the modelization of multivariate control charts in a bayesian network. Thus, in the context of multivariate processes, we propose an original network structure allowing deciding if a fault is appeared in the process. More, this structure permits the identification of the variables that are responsible (root causes) of the fault. A particular interest of the method is the fact that the detection and the identification can be made with a unique tool: a bayesian network.

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