

A study of function-based diagnosis strategy and testability analysis for  
a system.

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### Abstract

A good diagnostic policy can not only shorten the detection time of faults but also improve the effectiveness of system maintenance. This paper presents a function-based diagnosis strategy that provides a helpful methodology for fault identification. The diagnosis trees of the systems are constructed based on a functional block diagram consisting of function elements (FEs) and test points (TPs). The correlations between the FEs and the TPs are first analysed according to system information flows. Two weighted indexes for fault detection and fault isolation are defined to determine the priority of these TPs in testing. Several parameters related to diagnostic ability are also introduced to provide an evaluated approach for system testability. The diagnostic steps and costs between traditional sequential testing and the function-based diagnosing are compared. The study results may be useful in planning diagnosis actions and testability design for a system. A hydraulic system is used as an example in order to depict the proposed methods.

Keyword : testability, maintenance, test points, diagnosis tree