

Special Issue on
Fault Diagnosis and Application to Modern Systems

CALL FOR PAPERS

Fault diagnosis (FD) technique for modern control systems has been an active field of research over the past four decades due to an increasing demand for higher performance, as well as due to higher safety and reliability standards. The whole FD problem consists of a fault detection unit and a fault isolation strategy as well as a fault estimation technique. The task of fault detection problem is to construct a residual signal which is then compared with a predefined threshold. When the residual exceeds the threshold, an alarm is generated. The scope of the fault isolation problem is to locate the true fault from all possible faults. The objective of the fault estimation problem is to determine the fault amplitude as well as the appearing time of the fault.

The existing FD techniques can be divided into two main categories: the model-based method and the data-driven approach. Once the mathematical model can be obtained for an objective system, a model-based FD method can provide exact decoupling or maximum attenuation to the factors except the target fault. On the other hand, when it is hard to obtain a mathematical model but enough historical data of a system can be obtained, data-driven approach is more applicable and may get a better FD result.

Recently, analytical-based FD techniques for modern systems, including both model-based methods and data-driven approaches, have received more and more attention. There have been an increasing number of the results reported in the literature for the topics of FD. Novel theoretical results and application cases stimulate the research of FD problems of recently developed modern systems.

This special issue is intended to present and discuss breakthrough technological developments of FD techniques as well as their successful application.

Potential topics include but are not limited to the following:

- ▶ Fault detection and isolation of networked systems
- ▶ Fault accommodation and system recovery
- ▶ Fault prognosis technique
- ▶ Fault isolation of simultaneous faults
- ▶ Fault detection of incipient faults
- ▶ Data-driven fault diagnosis
- ▶ Safety assessment of complex systems
- ▶ Development of physical fault diagnosis systems
- ▶ Statistical decision making for fault threshold selection
- ▶ Fault diagnosis using spectral analysis methods
- ▶ Fault diagnosis for distributed parameter systems (described by PDEs)
- ▶ Fault isolation techniques using statistical criteria
- ▶ Fault isolation using pattern recognition methods

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