New Approach for Fault Identification using Residual-based Fault Diagnosis

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ABSTRACT

Manufacturing machinery is becoming more complicated, and breakdowns of machinery are related to not only efficiency reduction, but also safety issues. Due to the needs for maintaining high reliability within facility operation, various methods for condition monitoring are suggested as the importance of maintenance has increased. Among the various prognostics and health management (PHM) techniques, in this paper, a model-based fault detection and isolation (FDI) technique for the diagnosis of the machine health condition is introduced. In particular, we suggest a new approach for the fault identification that extracts the information of the fault signal such as the magnitude or shape of the fault. The main idea of this methodology is in defining the relation between a fault signal and observer theory. For the proposed method, a numerical simulation is conducted to show the effectiveness of the fault detection and identification under various situations. Then a comparison between the proposed method and data-driven methods is conducted to show the difference in aspect for fault diagnosis.