

عنوان مقاله:

A Self-reconstructing Algorithm for Single and Multiple-sensor Fault Isolation Based on Auto-associative Neural Networks

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خلاصه مقاله:

Recently different approaches have been developed in the field of sensor fault diagnostics based on auto-associative neural network (AANN). In this paper, we present a novel algorithm called self-reconstructing auto-associative neural network (S-AANN) which is able to detect and isolate single faulty sensor via reconstruction. We have also extended the algorithm to be applicable to multiple fault conditions. The algorithm uses a calibration model based on AANN. AANN can reconstruct the faulty sensor using non-faulty sensors due to correlation between the process variables, and the mean of the difference between the reconstructed and original data determines which sensors are faulty. The algorithms are tested on a dimerization process. The simulation results show that the S-AANN can isolate multiple faulty sensors at a low computational time, which makes the algorithm appropriate candidate for online applications.

کلمات کلیدی:

Sensor Fault, Fault Isolation, Reconstruction Algorithm, Auto-associative Neural Networks, Multiple Faults

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