Sensor Fault Identification in Dynamic Processes

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Principal component analysis (PCA) has been used as a multivariate statistical method for fault detection, isolation and diagnosis in chemical processes. PCA has been successfully used for identifying faulty sensors under normal static operating condition.We describe a new sensor fault isolation approach in severe dynamic processes. First, we describe how to reconstruct noisy or faulty measurements in dynamic processes. The reconstructed measurements can be obtained by simple iterative optimization based on the correlation structure on the time-lagged data set. Then, we proposed a faulty sensor identifying index, which was first developed by Dunia et al., for the fault isolation approach in dynamic processes.The proposed dynamic sensor fault identification method gives considerably quick and consistent fault identification performance for the process with severe dynamics in comparison to the static sensor fault isolation approaches.