

Abstract

Mohamed E.Tamazin

Sensors fault estimation, isolation and detection using MIMO extended Kalman filter for industrial applications

Fault Detection and Isolation (FDI) technique became a necessary part in most industrial systems. This paper introduces a new fault state estimation and isolation technique based on Extended Multiple Model Adaptive Estimator (EMMAE) technique for industrial applications especially for industrial boiler systems. The boiler system contains six sensors in the input and three sensors in the output that used to identify linear system dynamics using state space model. System state and multiple sensor faults are estimated, isolated and detected using Extended Kalman Filter (EKF). Based on the estimated fault for each sensor features extraction, the faulty sensor is classified. The proposed technique is applied on real industrial boiler plant measurements data to demonstrate and validate the ability of proposed technique to implement online in real world.