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A Finite Memory Residual Generation Filter for Fault Detection

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Abstract : In the current paper, a residual generation filter with finite memory structure is proposed for fault detection. The proposed finite memory residual generation filter provides the residual by real-time filtering of fault vector using only the most recent finite observations and inputs on the window. It is shown that the residual given by the proposed residual generation filter provides the exact fault for noise-free systems. Finally, to illustrate the capability of the proposed residual generation filter, numerical examples are performed for the discretized DC motor system having the multiple sensor faults.

Keywords : residual generation filter, finite memory structure, kalman filter, fast detection
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