Robust Diagnosis Efficiency by Bond-Graph Approach

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Abstract : This paper presents an approach which detect and isolate efficiently a fault in a system. This approach avoids false alarms, non-detections and delays in detecting faults. A study case have been proposed to show the importance of taking into consideration the uncertainties in the decision-making procedure and their effect on the degradation diagnostic performance and advantage of using Bond Graph (BG) for such degradation. The use of BG in the Linear Fractional Transformation (LFT) form allows generating robust Analytical Redundancy Relations (ARR's), where the uncertain part of ARR's is used to generate the residuals adaptive thresholds. The study case concerns an electromechanical system composed of a motor, a reducer and an external load. The aim of this application is to show the effectiveness of the BG-LFT approach to robust fault detection.

Keywords : bond graph, LFT, uncertainties, detection and faults isolation, ARR
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