

Robust Diagnosis of an Electro-Mechanical Actuators, Bond Graph LFT Approach

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Abstract : The paper deals with robust Fault Detection and isolation with respect to parameter uncertainties based on linear fractional transformation form (LFT) Bond graph. The innovative interest of the proposed methodology is the use only one representation for systematic generation of robust analytical redundancy relations and adaptive residual thresholds for sensibility analysis. Furthermore, the parameter uncertainties are introduced graphically in the bond graph model. The methodology applied to the nonlinear industrial Electro-Mechanical Actuators (EMA) used in avionic systems, has determined first the structural monitorability analysis (which component can be monitored) with given instrumentation architecture with any need of complex calculation and secondly robust fault indicators for online supervision.

Keywords : bond graph (BG), electro mechanical actuators (EMA), fault detection and isolation (FDI), linear fractional transformation (LFT), mechatronic systems, parameter uncertainties, avionic system

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