

Application of model detection techniques to Health Monitoring for the Electrical Network of More Electric Aircraft

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Abstract—In this paper, a health monitoring problem for the electrical network of more electric aircraft is addressed. To undertake the health monitoring task, the multi-model detection technique is applied. Multi-model based approach associates to each health status a corresponding linear time invariant model which is derived by adjusting appropriately the non-faulty system model to a particular fault situation. The original health monitoring problem can be therefore formulated as a model detection problem. Besides the introduction of the theoretical preliminary of multi-model based approach, the computer-aided design process, right-sized modelling and realtime simulation based validation for residual generator with Dymola and Matlab are also discussed. Health monitoring for an input filter of an DC motor drive serves as an application case to illustrate the proposed scheme. The designed residual generators are validated on the original nonlinear system with time-domain simulation.