

Model Based Design of Fly-by-Wire Flight Controls System of a Fighter Aircraft

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Abstract : Modeling and simulation during the conceptual design phase are the most effective means of system testing resulting in time and cost savings as compared to the testing of hardware prototypes, which are mostly not available during the conceptual design phase. This paper uses the model-based design (MBD) method in designing the fly-by-wire flight controls system of a fighter aircraft using Simulink. The process begins with system definition and layout where modeling requirements and system components were identified, followed by hierarchical system layout to identify the sequence of operation and interfaces of system with external environment as well as the internal interface between the components. In the second step, each component within the system architecture was modeled along with its physical and functional behavior. Finally, all modeled components were combined to form the fly-by-wire flight controls system of a fighter aircraft as per system architecture developed. The system model developed using this method can be simulated using any simulation software to ensure that desired requirements are met even without the development of a physical prototype resulting in time and cost savings.

Keywords : fly-by-wire, flight controls system, model based design, Simulink

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