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A Generic Inner-Loop Control Law Structure for Six-Degree-Of-Freedom Conceptual Aircraft Design

By Timothy H. Cox

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 34 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. A generic control system framework for both real-time and batch six-degree-of-freedom simulations is presented. This framework uses a simplified dynamic inversion technique to allow for stabilization and control of any type of aircraft at the pilot interface level. The simulation, designed primarily for the real-time simulation environment, also can be run in a batch mode through a simple guidance interface. Direct vehicle-state acceleration feedback is required with the simplified dynamic inversion technique. The estimation of surface effectiveness within real-time simulation timing constraints also is required. The generic framework provides easily modifiable control variables, allowing flexibility in the variables that the pilot commands. A direct control allocation scheme is used to command aircraft effectors. Primary uses for this system include conceptual and preliminary design of aircraft, when vehicle models are rapidly changing and knowledge of vehicle six-degree-of-freedom performance is required. A simulated airbreathing hypersonic vehicle and simulated high-performance fighter aircraft are used to demonstrate the flexibility and utility of the control system. This item ships from La Vergne, TN. Paperback.



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