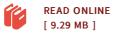# Aeroservoelastic Prediction

By Niyongere, Abraham

Condition: New. Publisher/Verlag: LAP Lambert Academic Publishing | Predicting the Effects of Control Nonlinearities on Control Laws Designed to Control Aeroelastic Systems | Aeroservoelasticity is the study of the interaction of automatic flight controls on aircraft and AeroElastic (AE) response and stability. The success in AeroServoElastic (ASE) prediction not only depends on the dynamic modelling of the ASE system's components but also on the coupling between the components. The book uses a substructuring methodology that decomposes the AE equation of an aircraft into two separate but coupled equations. The first equation relates airframe dynamics to control surface input whereas the second equation, combined with the actuation system dynamics, relates the command of the pilot to the output of the control surface. The two separate but coupled equations facilitate the investigation of the effects of control system nonlinearity on a control law designed to control an AE system. The substructuring technique is applied to a three-degrees-of-freedom ASE system. The derived equations allow a virtual linear/nonlinear flight flutter testing, a linear control law design that is based on the linear AE behaviour of the wing and an investigation of the effects of the control unit nonlinearity (freeplay and time delay) on the...

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