

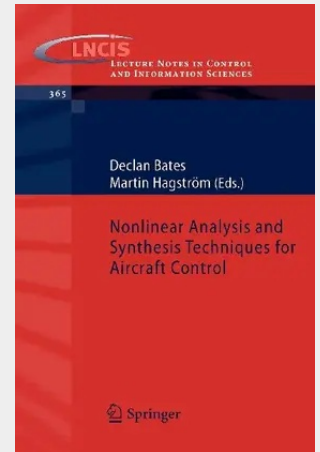
Nonlinear Analysis and Synthesis Techniques for Aircraft Control

Despite many significant advances in the theory of nonlinear control in recent years, the majority of control laws implemented in the European aerospace industry are still designed and analysed using predominantly linear techniques applied to linearised models of the aircrafts' dynamics. Given the continuous increase in the complexity of aircraft control laws, and the corresponding increase in the demands on their performance and reliability, industrial control law designers are highly motivated to explore the applicability of new and more powerful methods for design and analysis. The successful application of fully nonlinear control techniques to aircraft control problems offers the prospect of improvements in several different areas. Firstly, there is the possibility of improving design and analysis criteria to more fully reflect the nonlinear nature of the dynamics of the aircraft. Secondly, the time and effort required on the part of designers to meet demanding specifications on aircraft performance and handling could be reduced. Thirdly, nonlinear analysis techniques could potentially reduce the time and resources required to clear flight control laws, and help to bridge the gap between design, analysis and flight clearance.

The above considerations motivated the research presented in this book, which is the result of a three-year research effort organised by the Group for Aeronautical Research and Technology in Europe (GARTEUR). In September 2004, GARTEUR Flight Mechanics Action Group 17 (FM-AG17) was established to conduct research on "New Analysis and Synthesis Techniques for Aircraft Control".

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