



A Mathematical Perspective on Flight Dynamics and Control

By Andrea L'Afflitto

Springer-Verlag GmbH Feb 2017, 2017. Taschenbuch. Condition: Neu. Neuware - This brief presents several aspects of flight dynamics, which are usually omitted or briefly mentioned in textbooks, in a concise, self-contained, and rigorous manner. The kinematic and dynamic equations of an aircraft are derived starting from the notion of the derivative of a vector and then thoroughly analysed, interpreting their deep meaning from a mathematical standpoint and without relying on physical intuition. Moreover, some classic and advanced control design techniques are presented and illustrated with meaningful examples. Distinguishing features that characterize this brief include a definition of angular velocity, which leaves no room for ambiguities, an improvement on traditional definitions based on infinitesimal variations. Quaternion algebra, Euler parameters, and their role in capturing the dynamics of an aircraft are discussed in great detail. After having analyzed the longitudinal- and lateral-directional modes of an aircraft, the linear-quadratic regulator, the linear-quadratic Gaussian regulator, a state-feedback H-infinity optimal control scheme, and model reference adaptive control law are applied to aircraft control problems. To complete the brief, an appendix provides a compendium of the mathematical tools needed to comprehend the material presented in this brief and presents several advanced topics, such as the notion...



[READ ONLINE](#)
[8.07 MB]

Reviews

It is easy in study better to understand. Of course, it is actually play, nonetheless an amazing and interesting literature. I am quickly could possibly get a satisfaction of reading through a published ebook.

-- **Ms. Lucinda Koelpin**

This pdf is wonderful. We have go through and so i am certain that i am going to going to study yet again once more in the future. Its been developed in an exceedingly straightforward way which is merely after i finished reading through this pdf where really transformed me, modify the way i think.

-- **Ollie Balistreri**