1. Record Nr. UNINA9910463787503321

Autore	Durham Wayne <1941->
Titolo	Aircraft flight dynamics and control [[electronic resource] /] / Wayne Durham
Pubbl/distr/stampa	Chichester, West Sussex, : John Wiley & Sons, Inc., 2013
ISBN	1-118-64680-0 1-118-64679-7
Descrizione fisica	1 online resource (308 p.)
Collana	Aerospace series
Disciplina	629.132/3
Soggetti	Aerodynamics Flight Flight control Airplanes - Performance Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Title Page; Copyright; Contents; Series Preface; Glossary; Chapter 1 Introduction; 1.1 Background; 1.2 Overview; 1.3 Customs and Conventions; References; Chapter 2 Coordinate Systems; 2.1 Background; 2.2 The Coordinate Systems; 2.2.1 The inertial reference frame, FI; 2.2.2 The earth-centered reference frame, FEC; 2.2.3 The earth-fixed reference frame, FE; 2.2.4 The local-horizontal reference frame, FH; 2.2.5 Body-fixed reference frames, FB; 2.2.6 Wind-axis system, FW; 2.2.7 Atmospheric reference frame; 2.3 Vector Notation; 2.4 Customs and Conventions; 2.4.1 Latitude and longitude 2.4.2 Body axes2.4.3 `The' body-axis system; 2.4.4 Aerodynamic angles; Problems; References; Chapter 3 Coordinate System Transformations; 3.1 Problem Statement; 3.2 Transformations; 3.2.1 Definitions; 3.2.2 Direction cosines; 3.2.3 Euler angles; 3.2.4 Euler parameters; 3.3 Transformations of Systems of Equations; 3.4 Customs and Conventions; 3.4.1 Names of Euler angles; 3.4.2 Principal values of Euler angles; Problems; Reference; Chapter 4 Rotating Coordinate Systems; 4.1 General; 4.2 Direction Cosines; 4.3 Euler Angles; 4.4 Euler Parameters; 4.5 Customs and Conventions

4.5.1 Angular velocity componentsProblems; Chapter 5 Inertial Accelerations; 5.1 General; 5.2 Inertial Acceleration of a Point; 5.2.1 Arbitrary moving reference frame; 5.2.2 Earth-centered moving reference frame; 5.2.3 Earth-fixed moving reference frame; 5.3 Inertial Acceleration of a Mass; 5.3.1 Linear acceleration; 5.3.2 Rotational acceleration; 5.4 States; 5.5 Customs and Conventions; 5.5.1 Linear velocity components; 5.5.2 Angular velocity components; 5.5.3 Forces; 5.5.4 Moments; 5.5.5 Groupings; Problems; Chapter 6 Forces and Moments; 6.1 General; 6.1.1 Assumptions; 6.1.2 State variables
6.1.3 State rates6.1.4 Flight controls; 6.1.5 Independent variables; 6.2 Non-Dimensionalization; 6.3 Non-Dimensional Coefficient Dependencies; 6.3.1 General; 6.3.2 Altitude dependencies; 6.3.3 Velocity dependencies; 6.3.4 Angle-of-attack dependencies; 6.3.5 Sideslip dependencies; 6.3.6 Angular velocity dependencies; 6.3.7 Control dependencies; 6.3.8 Summary of dependencies; 6.4 The Linear Assumption; 6.5 Tabular Data; 6.6 Customs and Conventions; Problems; Chapter 7 Equations of Motion; 7.1 General; 7.2 Body-Axis Equations; 7.2.1 Body-axis force equations; 7.2.2 Body-axis moment equations
7.2.3 Body-axis orientation equations (kinematic equations)7.2.4 Body-axis navigation equations; 7.3 Wind-Axis Equations; 7.3.1 Wind-axis force equations; 7.3.2 Wind-axis orientation equations (kinematic equations); 7.3.3 Wind-axis navigation equations; 7.4 Steady-State Solutions; 7.4.1 General; 7.4.2 Special cases; 7.4.3 The trim problem; Problems; Reference; Chapter 8 Linearization; 8.1 General; 8.2 Taylor Series; 8.3 Nonlinear Ordinary Differential Equations; 8.4 Systems of Equations; 8.5 Examples; 8.5.1 General; 8.5.2 A kinematic equation; 8.5.3 A moment equation; 8.5.4 A force equation
8.6 Customs and Conventions

Sommario/riassunto

Aircraft Flight Dynamics and Control addresses airplane flight dynamics and control in a largely classical manner, but with references to modern treatment throughout. Classical feedback control methods are illustrated with relevant examples, and current trends in control are presented by introductions to dynamic inversion and control allocation. This book covers the physical and mathematical fundamentals of aircraft flight dynamics as well as more advanced theory enabling a better insight into nonlinear dynamics. This leads to a useful introduction to automatic flight control and stab