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Nota di contenuto	Cover; Unmanned Aerial Vehicles; Title Page; Copyright Page; Table of Contents; Chapter 1. Aerodynamic Configurations and Dynamic Models; 1.1. Aerodynamic configurations; 1.2. Dynamic models; 1.2.1. Newton-Euler approach; 1.2.2. Euler-Lagrange approach; 1.2.3. Quaternion approach; 1.2.4. Example: dynamic model of a quad-rotor rotorcraft; 1.3. Bibliography; Chapter 2. Nested Saturation Control for Stabilizing the PVTOL Aircraft; 2.1. Introduction; 2.2. Bibliographical study; 2.3. The PVTOL aircraft model; 2.4. Control strategy; 2.4.1. Control of the vertical displacement y 2.4.2. Control of the roll angle ϕ and the horizontal displacement x_2 . 4.2.1. Boundedness of y ; 2.4.2.2. Boundedness of ϕ ; 2.4.2.3. Boundedness of x_1 ; 2.4.2.4. Boundedness of x_2 ; 2.4.2.5. Convergence of y, ϕ, x_1 and x_2 to zero; 2.5. Other control strategies for the stabilization of the PVTOL aircraft; 2.6. Experimental results; 2.7. Conclusions; 2.8. Bibliography; Chapter 3. Two-Rotor VTOL Mini UAV: Design, Modeling and Control; 3.1. Introduction; 3.2. Dynamic model; 3.2.1. Kinematics;

3.2.2. Dynamics; 3.2.2.1. Forces acting on the vehicle; 3.2.2.2. Torques acting on the vehicle
3.2.3. Model for control analysis
3.3. Control strategy; 3.3.1. Altitude control; 3.3.2. Horizontal motion control; 3.3.3. Attitude control; 3.4. Experimental setup; 3.4.1. Onboard flight system (OFS); 3.4.2. Outboard visual system; 3.4.2.1. Position; 3.4.2.2. Optical flow; 3.4.3. Experimental results; 3.5. Concluding remarks; 3.6. Bibliography;
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4.4.1. Real-time PC-control system (PCCS); 4.4.1.1. Sensors and communication hardware; 4.4.2. Experimental results; 4.5. Conclusion; 4.6. Bibliography;
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6.3. Attitude control of a flying VTOL vehicle

Sommario/riassunto

This book presents the basic tools required to obtain the dynamical models for aerial vehicles (in the Newtonian or Lagrangian approach). Several control laws are presented for mini-helicopters, quadrotors, mini-blimps, flapping-wing aerial vehicles, planes, etc. Finally, this book has two chapters devoted to embedded control systems and Kalman filters applied for aerial vehicles control and navigation. This book presents the state of the art in the area of UAVs. The aerodynamical models of different configurations are presented in detail as well as the control strategies which are validated i
