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Nota di contenuto	Frontmatter -- Contents -- List of Figures -- List of Tables -- Preface and Acknowledgments -- Chapter 1. Natural Motions of Rigid Spacecraft -- Chapter 2. Spacecraft Sensors and Attitude Determination -- Chapter 3. Attitude Control with Thrusters -- Chapter 4. Attitude Control with Reaction Wheels -- Chapter 5. Attitude Stabilization with Spin -- Chapter 6. Attitude Control with a Gimbaled Momentum Wheel -- Chapter 7. Attitude Control during Thrust Maueuvers -- Chapter 8. Control of Translational Motions -- Chapter 9. Flexibility and Fuel Slosh -- Chapter 10. Natural Motions of Rigid Aircraft -- Chapter 11. Aircraft Seusors -- Chapter 12. Control of Longitudinal Motions of Aircraft -- Chapter 13. Control of Lateral Motions of Aircraft -- Chapter 14. Control of Helicopters near Hover -- Chapter 15. Aeroelastic Systems -- Appendix A. Linear System Representations -- Appendix B. Steady-State Control -- Appendix C. Synthesis of Analog Control Logic -- Appendix D. Synthesis of Digital Control Logic -- Appendix E. Simulation -- Appendix F. Modeling Flexible Systems -- References -- Index
Sommario/riassunto	Here a leading researcher provides a comprehensive treatment of the design of automatic control logic for spacecraft and aircraft. In this

book Arthur Bryson describes the linear-quadratic-regulator (LQR) method of feedback control synthesis, which coordinates multiple controls, producing graceful maneuvers comparable to those of an expert pilot. The first half of the work is about attitude control of rigid and flexible spacecraft using momentum wheels, spin, fixed thrusters, and gimbaled engines. Guidance for nearly circular orbits is discussed. The second half is about aircraft attitude and flight path control. This section discusses autopilot designs for cruise, climb-descent, coordinated turns, and automatic landing. One chapter deals with controlling helicopters near hover, and another offers an introduction to the stabilization of aeroelastic instabilities. Throughout the book there is a strong emphasis on the mathematical modeling necessary for designing a good feedback control system. The appendixes summarize analysis of linear dynamic systems, synthesis of analog and digital feedback control, simulation, and modeling of flexible vehicles.