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Titolo	Synchronization of Integral and Fractional Order Chaotic Systems : A Differential Algebraic and Differential Geometric Approach With Selected Applications in Real-Time / / by Rafael Martínez-Guerra, Claudia A. Pérez-Pinacho, Gian Carlo Gómez-Cortés
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Soggetti	Nonlinear Optics Multibody systems Vibration Mechanics, Applied Physics Dynamics Nonlinear theories Multibody Systems and Mechanical Vibrations Classical and Continuum Physics Applied Dynamical Systems
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Nota di contenuto	Control theory and synchronization -- A model-free based proportional reduced-order observer design for the synchronization of Lorenz system -- A Model-Free Sliding Observer to Synchronization Problem Using Geometric Techniques -- Experimental synchronization by means of observers -- Synchronization of an uncertain Rikitake System with parametric estimation -- Secure Communications and Synchronization via a Sliding-mode Observer -- Synchronization and anti-synchronization of chaotic systems: A differential and algebraic approach -- Synchronization of chaotic Liouvillian systems: An application to Chua's oscillator -- Synchronization of Partially unknown Nonlinear Fractional Order Systems -- Generalized Synchronization via

the differential primitive element -- Generalized synchronization for a class of non-differentially flat and Liouvillian chaotic systems -- Generalized multi-synchronization by means of a family of dynamical feedbacks -- Fractional generalized synchronization in nonlinear fractional order systems via a dynamical feedback -- An Observer for a Class of Incommensurate Fractional Order Systems -- Appendix -- Index.

Sommario/riassunto

This book provides a general overview of several concepts of synchronization and brings together related approaches to secure communication in chaotic systems. This is achieved using a combination of analytic, algebraic, geometrical and asymptotical methods to tackle the dynamical feedback stabilization problem. In particular, differential-geometric and algebraic differential concepts reveal important structural properties of chaotic systems and serve as guide for the construction of design procedures for a wide variety of chaotic systems. The basic differential algebraic and geometric concepts are presented in the first few chapters in a novel way as design tools, together with selected experimental studies demonstrating their importance. The subsequent chapters treat recent applications. Written for graduate students in applied physical sciences, systems engineers, and applied mathematicians interested in synchronization of chaotic systems and in secure communications, this self-contained text requires only basic knowledge of integer ordinary and fractional ordinary differential equations. Design applications are illustrated with the help of several physical models of practical interest.
