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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- Geometry of Second-Order Random Processes -- Spectral Representation of Stationary Processes -- Innovations, Wold Decomposition, and Spectral Factorization -- Wold Decomposition and Spectral Factorization in Continuous Time -- Linear Finite-Dimensional Stochastic Systems -- The Geometry of Splitting Subspaces -- Markovian Representations -- Proper Markovian Representations in Hardy Space -- Stochastic Realization Theory in Continuous Time -- Stochastic Balancing and Model Reduction -- Finite-Interval Stochastic Realization and Partial Realization Theory -- Subspace Identification for Time Series -- Zero Dynamics and the Geometry of the Riccati Inequality -- Smoothing and Interpolation -- Acausal Linear Stochastic Models and Spectral Factorization -- Stochastic Systems with Inputs -- Appendix A. Basic Principles of Deterministic Realization Theory -- Appendix B. Some Topics in Linear Algebra and Hilbert Space Theory.

Sommario/riassunto

This book presents a treatise on the theory and modeling of second-order stationary processes, including an exposition on selected application areas that are important in the engineering and applied sciences. The foundational issues regarding stationary processes dealt with in the beginning of the book have a long history, starting in the 1940s with the work of Kolmogorov, Wiener, Cramér and his students, in particular Wold, and have since been refined and complemented by many others. Problems concerning the filtering and modeling of stationary random signals and systems have also been addressed and studied, fostered by the advent of modern digital computers, since the fundamental work of R.E. Kalman in the early 1960s. The book offers a unified and logically consistent view of the subject based on simple ideas from Hilbert space geometry and coordinate-free thinking. In this framework, the concepts of stochastic state space and state space modeling, based on the notion of the conditional independence of past and future flows of the relevant signals, are revealed to be fundamentally unifying ideas. The book, based on over 30 years of original research, represents a valuable contribution that will inform the fields of stochastic modeling, estimation, system identification, and time series analysis for decades to come. It also provides the mathematical tools needed to grasp and analyze the structures of algorithms in stochastic systems theory.