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Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	From the Contents: Linear Estimators of a Random-Parameter Vector.- Basis of the Method of Polynomial Approximation -- Polynomial Approximation and Optimization of Control -- Polynomial Approximation Technique Applied to Inverse Vector Functions -- Identification of Parameters of Nonlinear Dynamical Systems: Smoothing, Filtering and Forecasting the State Vector -- Estimating Status Vectors from Sight Angles -- Estimation of Parameters of Stochastic Models -- Designing the Control of Motion to a Target Point of Phase Space -- Inverse Problems of Dynamics Algorithm for

Sommario/riassunto

This monograph is an exposition of a novel method for solving inverse problems, a method of parameter estimation for time series data collected from simulations of real experiments. These time series might be generated by measuring the dynamics of aircraft in flight, by the function of a hidden Markov model used in bioinformatics or speech recognition or when analyzing the dynamics of asset pricing provided by the nonlinear models of financial mathematics. Dynamic Systems Models demonstrates the use of algorithms based on polynomial approximation which have weaker requirements than already-popular iterative methods. Specifically, they do not require a first approximation of a root vector and they allow non-differentiable elements in the vector functions being approximated. The text covers all the points necessary for the understanding and use of polynomial approximation from the mathematical fundamentals, through algorithm development to the application of the method in, for instance, aeroplane flight dynamics or biological sequence analysis. The technical material is illustrated by the use of worked examples and methods for training the algorithms are included. Dynamic Systems Models provides researchers in aerospace engineering, bioinformatics and financial mathematics (as well as computer scientists interested in any of these fields) with a reliable and effective numerical method for nonlinear estimation and solving boundary problems when carrying out control design. It will also be of interest to academic researchers studying inverse problems and their solution.
