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Nota di contenuto	Nonlinear System Identification: NARMAX Methods in the Time, Frequency, and Spatio-Tempora Domains; Copyright; Contents; Preface; 1 Introduction; 1.1 Introduction to System Identification; 1.1.1 System Models and Simulation; 1.1.2 Systems and Signals; 1.1.3 System Identification; 1.2 Linear System Identification; 1.3 Nonlinear System Identification; 1.4 NARMAX Methods; 1.5 The NARMAX Philosophy; 1.6 What is System Identification For?; 1.7 Frequency Response of Nonlinear Systems; 1.8 Continuous-Time, Severely Nonlinear, and Time-Varying Models and Systems; 1.9 Spatio-temporal Systems 1.10 Using Nonlinear System Identification in Practice and Case Study ExamplesReferences; 2 Models for Linear and Nonlinear Systems; 2.1 Introduction; 2.2 Linear Models; 2.2.1 Autoregressive Moving Average with Exogenous Input Model; 2.2.1.1 FIR Model; 2.2.1.2 AR Model; 2.2.1.3 MA Model; 2.2.1.4 ARMA Model; 2.2.1.5 ARX Model; 2.2.1.6 ARMAX Model; 2.2.1.7 Box-Jenkins Model; 2.2.2 Parameter Estimation for Linear Models; 2.2.2.1 ARX Model Parameter Estimation - The Least Squares Algorithm; 2.2.2.2 ARMAX Model Parameter Estimation - The Extended Least Squares Algorithm

2.3 Piecewise Linear Models
2.3.1 Spatial Piecewise Linear Models;
2.3.1.1 Operating Regions; 2.3.1.2 Parameter Estimation; 2.3.1.3 Simulation Example; 2.3.2 Models with Signal-Dependent Parameters;
2.3.2.1 Decomposition of Signal-Dependent Models; 2.3.2.2 Parameter Estimation of Signal-Dependent Models; 2.3.2.3 Simulation Example; 2.3.3 Remarks on Piecewise Linear Models; 2.4 Volterra Series Models; 2.5 Block-Structured Models; 2.5.1 Parallel Cascade Models; 2.5.2 Feedback Block-Structured Models; 2.6 NARMAX Models; 2.6.1 Polynomial NARMAX Model; 2.6.2 Rational NARMAX Model
2.6.2.1 Integral Model; 2.6.2.2 Recursive Model; 2.6.2.3 Output-affine Model; 2.6.3 The Extended Model Set Representation; 2.7 Generalised Additive Models; 2.8 Neural Networks; 2.8.1 Multi-layer Networks; 2.8.2 Single-Layer Networks; 2.8.2.1 Activation Functions; 2.8.2.2 Radial Basis Function Networks; 2.9 Wavelet Models; 2.9.1 Dynamic Wavelet Models; 2.9.1.1 Random Noise; 2.9.1.2 Coloured Noise; 2.10 State-Space Models; 2.11 Extensions to the MIMO Case; 2.12 Noise Modelling; 2.12.1 Noise-Free; 2.12.2 Additive Random Noise; 2.12.3 Additive Coloured Noise; 2.12.4 General Noise
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3.3.1.2 Variants of the FROLS Algorithm

Sommario/riassunto

Nonlinear System Identification: NARMAX Methods in the Time, Frequency, and Spatio-Temporal Domains describes a comprehensive framework for the identification and analysis of nonlinear dynamic systems in the time, frequency, and spatio-temporal domains. This book is written with an emphasis on making the algorithms accessible so that they can be applied and used in practice. Includes coverage of: The NARMAX (nonlinear autoregressive moving average with exogenous inputs) model
The orthogonal least squares algorithm that allows models to be built term by
