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Nota di contenuto	Contents; Preface; Acknowledgments; List of Operators and Notational Conventions; List of Symbols; List of Abbreviations; CHAPTER 1 An Introduction to Identification; 1.1 What Is Identification?; 1.2 Identification: A Simple Example; 1.2.1 Estimation of the Value of a Resistor; 1.2.2 Simplified Analysis of the Estimators; 1.2.3 Interpretation of the Estimators: A Cost Function-Based Approach; 1.3 Description of the Stochastic Behavior of Estimators; 1.3.1 Location Properties: Unbiased and Consistent Estimates; 1.3.2 Dispersion Properties: Efficient Estimators 1.4 Basic Steps in the Identification Process1.4.1 Collect Information about the System; 1.4.2 Select a Model Structure to Represent the System; 1.4.3 Match the Selected Model Structure to the Measurements; 1.4.4 Validate the Selected Model; 1.4.5 Conclusion; 1.5 A Statistical Approach to the Estimation Problem; 1.5.1 Least Squares Estimation; 1.5.2 Weighted Least Squares Estimation; 1.5.3 The Maximum Likelihood Estimator; 1.5.4 The Bayes Estimator; 1.5.5 Instrumental Variables; 1.6 Exercises; CHAPTER 2 Measurements of Frequency

Response Functions; 2.1 Introduction
2.2 An Introduction to the Discrete Fourier Transform2.2.1 The Sampling Process; 2.2.2 The Discrete Fourier Transform (DFT-FFT); 2.2.3 DFT Properties of Periodic Signals; 2.2.4 DFT of Burst Signals; 2.2.5 Conclusion; 2.3 Spectral Representations of Periodic Signals; 2.4 Analysis of FRF Measurements Using Periodic Excitations; 2.4.1 Measurement Setup; 2.4.2 Error Analysis; 2.5 Reducing FRF Measurement Errors for Periodic Excitations; 2.5.1 Basic Principles; 2.5.2 Processing Repeated Measurements; 2.5.3 Improved Averaging Methods for Nonsynchronized Measurements; 2.5.4 Coherence
2.6 FRF Measurements Using Random Excitations2.6.1 Basic Principles; 2.6.2 Reducing the Noise Influence; 2.6.3 Leakage Errors; 2.6.4 Improved FRF Measurements for Random Excitations; 2.7 FRF Measurements of Multiple Input, Multiple Output Systems; 2.8 Guidelines for FRF Measurements; 2.8.1 Guideline 1: Use Periodic Excitations; 2.8.2 Guideline 2: Select the Best FRF Estimator; 2.8.3 Guideline 3: Pretreatment of Data; 2.9 Conclusion; 2.10 Exercises; 2.11 Appendixes; Appendix 2.A: Asymptotic Behavior of Averaging Techniques; Appendix 2.B: Proof of Theorem 2.6 (On Decaying Leakage Errors)
CHAPTER 3 Frequency Response Function Measurements in the Presence of Nonlinear Distortions3.1 Introduction; 3.2 Intuitive Understanding of the Behavior of Nonlinear Systems; 3.3 A Formal Framework to Describe Nonlinear Distortions; 3.3.1 Class of Excitation Signals; 3.3.2 Selection of a Model Structure for the Nonlinear System; 3.4 Study of the Properties of FRF Measurements in the Presence of Nonlinear Distortions; 3.4.1 Study of the Expected Value of the FRF for a Constant Number of Harmonics; 3.4.2 Asymptotic Behavior of the FRF if the Number of Harmonics Tends to Infinity
3.4.3 Further Comments on the Related Linear Dynamic System

Sommario/riassunto

Electrical Engineering System Identification A Frequency Domain Approach How does one model a linear dynamic system from noisy data? This book presents a general approach to this problem, with both practical examples and theoretical discussions that give the reader a sound understanding of the subject and of the pitfalls that might occur on the road from raw data to validated model. The emphasis is on robust methods that can be used with a minimum of user interaction. Readers in many fields of engineering will gain knowledge about:* Choice of experimental setup and experiment design* A