

1. Record Nr.	UNINA9910820447003321
Autore	Doraiswami Rajamani
Titolo	Identification of physical systems : applications to condition monitoring, fault diagnosis, softsensor, and controller design // Rajamani Doraiswami, Chris Diduch and Maryhelen Stevenson
Pubbl/distr/stampa	Chichester, West Sussex, United Kingdom : , : John Wiley & Sons, , 2014 ©2014
ISBN	1-118-53649-5 1-118-53648-7 1-118-53650-9
Descrizione fisica	1 online resource (538 p.)
Disciplina	620.001/1
Soggetti	Systems engineering Systems engineering - Mathematics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	IDENTIFICATION OF PHYSICAL SYSTEMS; Contents; Preface; Nomenclature; 1 Modeling of Signals and Systems; 1.1 Introduction; 1.2 Classification of Signals; 1.2.1 Deterministic and Random Signals; 1.2.2 Bounded and Unbounded Signal; 1.2.3 Energy and Power Signals; 1.2.4 Causal, Non-causal, and Anti-causal Signals; 1.2.5 Causal, Non-causal, and Anti-causal Systems; 1.3 Model of Systems and Signals; 1.3.1 Time-Domain Model; 1.3.2 Frequency-Domain Model; 1.4 Equivalence of Input-Output and State-Space Models; 1.4.1 State-Space and Transfer Function Model 1.4.2 Time-Domain Expression for the Output Response 1.4.3 State-Space and the Difference Equation Model; 1.4.4 Observer Canonical Form; 1.4.5 Characterization of the Model; 1.4.6 Stability of (Discrete-Time) Systems; 1.4.7 Minimum Phase System; 1.4.8 Pole-Zero Locations and the Output Response; 1.5 Deterministic Signals; 1.5.1 Transfer Function Model; 1.5.2 Difference Equation Model; 1.5.3 State-Space Model; 1.5.4 Expression for an Impulse Response; 1.5.5 Periodic Signal; 1.5.6 Periodic Impulse Train; 1.5.7 A Finite Duration Signal; 1.5.8 Model of a Class of All Signals

1.5.9 Examples of Deterministic Signals; 1.6 Introduction to Random Signals; 1.6.1 Stationary Random Signal; 1.6.2 Joint PDF and Statistics of Random Signals; 1.6.3 Ergodic Process; 1.7 Model of Random Signals; 1.7.1 White Noise Process; 1.7.2 Colored Noise; 1.7.3 Model of a Random Waveform; 1.7.4 Classification of the Random Waveform; 1.7.5 Frequency Response and Pole-Zero Locations; 1.7.6 Illustrative Examples of Filters; 1.7.7 Illustrative Examples of Random Signals; 1.7.8 Pseudo Random Binary Sequence (PRBS); 1.8 Model of a System with Disturbance and Measurement Noise
 1.8.1 Input-Output Model of the System; 1.8.2 State-Space Model of the System; 1.8.3 Illustrative Examples in Integrated System Model; 1.9 Summary; References; Further Readings; 2 Characterization of Signals: Correlation and Spectral Density; 2.1 Introduction; 2.2 Definitions of Auto- and Cross-Correlation (and Covariance); 2.2.1 Properties of Correlation; 2.2.2 Normalized Correlation and Correlation Coefficient; 2.3 Spectral Density: Correlation in the Frequency Domain; 2.3.1 Z-transform of the Correlation Function; 2.3.2 Expressions for Energy and Power Spectral Densities
 2.4 Coherence Spectrum; 2.5 Illustrative Examples in Correlation and Spectral Density; 2.5.1 Deterministic Signals: Correlation and Spectral Density; 2.5.2 Random Signals: Correlation and Spectral Density; 2.6 Input-Output Correlation and Spectral Density; 2.6.1 Generation of Random Signal from White Noise; 2.6.2 Identification of Non-Parametric Model of a System; 2.6.3 Identification of a Parametric Model of a Random Signal; 2.7 Illustrative Examples: Modeling and Identification; 2.8 Summary; 2.9 Appendix; References; 3 Estimation Theory; 3.1 Overview
 3.2 Map Relating Measurement and the Parameter

Sommario/riassunto

Develops a systematic and a unified approach to the problem of physical system identification and its practical applications. There is a need for a book which develops a systematic and a unified approach to the problem of physical system identification and its practical applications. Identification of Physical Systems addresses this need, developing identification theory using a coherent, simple and yet rigorous approach. Starting with a least-squares method, the author develops various schemes to address the issues of accuracy, variation in the operating regimes, closed loop and inter