1. Record Nr. UNINA9910455043603321

Autore	Feng Jiu Chao
Titolo	Reconstruction of chaotic signals with applications to chaos-based communications [[electronic resource] /] / Jiu Chao Feng, Chi Kong Tse
Pubbl/distr/stampa	[Beijing, China], : Tsinghua University Press Singapore ; ; Hackensack, NJ, : World Scientific, c2008
ISBN	981-277-114-X
Descrizione fisica	1 online resource (232 p.)
Altri autori (Persone)	TseChi Kong
Disciplina	621.3822
Soggetti	Signal processing Telecommunication - Quality control Chaotic behavior in systems Electronic books.
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 (p. 188-218) and index.
Nota di contenuto	Preface; Acknowledgements; Contents; 1 Chaos and Communications; 1.1 Historical Account; 1.2 Chaos; 1.3 Quantifying Chaotic Behavior; 1.3.1 Lyapunov Exponents for Continuous-Time Nonlinear Systems; 1.3.2 Lyapunov Exponent for Discrete-Time Systems; 1.3.3 Kolmogorov Entropy; 1.3.4 Attractor Dimension; 1.4 Properties of Chaos; 1.5 Chaos-Based Communications; 1.5.1 Conventional Spread Spectrum; 1.5.2 Spread Spectrum with Chaos; 1.5.3 Chaotic Synchronization; 1.6 Communications Using Chaos as Carriers; 1.6.1 Chaotic Masking Modulation; 1.6.2 Dynamical Feedback Modulation 1.6.3 Inverse System Modulation 1.6.4 Chaotic Modulation; 1.6.5 Chaos Shift Keying; 1.6.6 Differential Chaos Shift Keying Modulation; 1.7 Remarks on Chaos-Based Communications; 1.7.1 Security Issues; 1.7.2 Engineering Challenges; 2 Reconstruction of Signals; 2.1 Reconstruction of System Dynamics; 2.1.1 Topological Embeddings; 2.1.2 Delay Coordinates; 2.2 Differentiable Embeddings; 2.3 Phase Space Reconstruction-Example; 2.4 Problems and Research Approaches; 3 Fundamentals of Neural Networks; 3.1 Motivation; 3.2 Benefits of Neural Networks; 3.3 Radial Basis Function Neural Networks 3.3.1 Background Theory 3.3.2 Research Progress in Radial Basis

Function Networks; 3.4 Recurrent Neural Networks; 3.4.1 Introduction; 3.4.2 Topology of the Recurrent Networks; 3.4.3 Learning Algorithms; 4 Signal Reconstruction in Noise free and Distortionless Channels; 4.1 Reconstruction of Attractor for Continuous Time-Varying Systems; 4.2 Reconstruction and Observability; 4.3 Communications Based on Reconstruction Approach; 4.3.1 Parameter Estimations; 4.3.2 Information Retrievals; 4.4 Reconstruction of Attractor for Discrete Time-Varying Systems; 4.5 Summary
5 Signal Reconstruction from a Filtering Viewpoint: Theory 5.1 The Kalman Filter and Extended Kalman Filter; 5.1.1 The Kalman Filter; 5.1.2 Extended Kalman Filter; 5.2 The Unscented Kalman Filter; 5.2.1 The Unscented Kalman Filtering Algorithm; 5.2.2 Convergence Analysis for the UKF Algorithm; 5.2.3 Computer Simulations; 5.2.3.1 Type 1; 5.2.3.2 Type 2; 5.2.3.3 Type 3; 5.3 Summary; 6 Signal Reconstruction from a Filtering Viewpoint: Application; 6.1 Introduction; 6.2 Filtering of Noisy Chaotic Signals; 6.2.1 Filtering Algorithm; 6.2.2 Computer Simulation
6.3 Blind Equalization for Fading Channels 6.3.1 Modeling of Wireless Communication Channels; 6.3.2 Blind Equalization of Fading Channels with Fixed Channel Coefficients; 6.3.3 Blind Equalization for Time-Varying Fading Channels; 6.4 Summary; 7 Signal Reconstruction in Noisy Channels; 7.1 Review of Chaotic Modulation; 7.2 Formulation of Chaotic Modulation and Demodulation; 7.3 On-Line Adaptive Learning Algorithm and Demodulation; 7.3.1 Description of the Network; 7.3.2 Network Growth; 7.3.3 Network Update with Extended Kalman Filter; 7.3.4 Pruning of Hidden Units
7.3.5 Summary of the Flow of Algorithm

Sommario/riassunto

This book provides a systematic review of the fundamental theory of signal reconstruction and the practical techniques used in reconstructing chaotic signals. Specific applications of signal reconstruction methods in chaos-based communications are expounded in full detail, along with examples illustrating the various problems associated with such applications.The book serves as an advanced textbook for undergraduate and graduate courses in electronic and information engineering, automatic control, physics and applied mathematics. It is also highly suited for general nonlinear scientists who