1. Record Nr. UNINA9910818048003321

Titolo	Advanced Topics in Shannon Sampling and Interpolation Theory / / edited by Robert J.II Marks
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1993
ISBN	1-4613-9757-X
Edizione	[1st ed. 1993.]
Descrizione fisica	1 online resource (XIII, 360 p.)
Collana	Springer Texts in Electrical Engineering, , 1431-8482
Disciplina	621.3
Soggetti	Electrical engineering Computers Chemometrics Computational intelligence Electrical Engineering Models and Principles Math. Applications in Chemistry Computational Intelligence
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Gabor’s Signal Expansion and Its Relation to Sampling of the Sliding-Window Spectrum -- 1.1 Introduction -- 1.2 Sliding-Window Spectrum -- 1.3 Sampling Theorem for the Sliding-Window Spectrum -- 1.4 Examples of Window Functions -- 1.5 Gabor’s Signal Expansion -- 1.6 Examples of Elementary Signals -- 1.7 Degrees of Freedom of a Signal -- 1.8 Optical Generation of Gabor’s Expansion Coefficients for Rastered Signals -- 1.9 Conclusion -- 2 Sampling in Optics -- 2.1 Introduction -- 2.2 Historical Background -- 2.3 The von Laue Analysis -- 2.4 Degrees of Freedom of an Image -- 2.5 Superresolving Pupils -- 2.6 Fresnel SampHng -- 2.7 Exponential SampHng -- 2.8 Partially Coherent Fields -- 2.9 Optical Processing -- 2.10 Conclusion -- 3 A Multidimensional Extension of Papoulis’ Generalized Sampling Expansion with the Application in Minimum Density Sampling -- I: A Multidimensional Extension of Papoulis’ Generalized Sampling Expansion -- 3.1 Introduction -- 3.2 GSE Formulation -- 3.3 M-D Extension -- 3.4 Extension Generalization -- 3.5 Conclusion -- II:

Sampling Multidimensional Band-Limited Functions At Minimum Densities -- 3.6 Sample Interdependency -- 3.7 Sampling Density Reduction Using M-D GSE -- 3.8 Computational Complexity of the Two Formulations -- 3.9 Sampling at the Minimum Density -- 3.10 Discussion -- 3.11 Conclusion -- 4 Nonuniform Sampling -- 4.1 Preliminary Discussions -- 4.2 General Nonuniform Sampling Theorems -- 4.3 Spectral Analysis of Nonuniform Samples and Signal Recovery -- 4.4 Discussion on Reconstruction Methods -- 5 Linear Prediction by Samples from the Past -- 5.1 Preliminaries -- 5.2 Prediction of Deterministic Signals -- 5.3 Prediction of Random Signals -- 6 Polar, Spiral, and Generalized Sampling and Interpolation -- 6.1 Introduction -- 6.2 Sampling in Polar Coordinates -- 6.3 Spiral Sampling -- 6.4 Reconstruction from Non-Uniform Samples by Convex Projections -- 6.5 Experimental Results -- 6.6 Conclusions -- Appendix A -- Appendix B -- 7 Error Analysis in Application of Generalizations of the Sampling Theorem -- Foreword: Welcomed General Sources for the Sampling Theorems -- 7.1 Introduction — Sampling Theorems -- 7.2 Error Bounds of the Present Extension of the Sampling Theorem -- 7.3 Applications -- Appendix A -- A.1 Analysis of Gibbs’ Phenomena.

Sommario/riassunto

Advanced Topics in Shannon Sampling and Interpolation Theory is the second volume of a textbook on signal analysis solely devoted to the topic of sampling and restoration of continuous time signals and images. Sampling and reconstruction are fundamental problems in any field that deals with real-time signals or images, including communication engineering, image processing, seismology, speech recognition, and digital signal processing. This second volume includes contributions from leading researchers in the field on such topics as Gabor's signal expansion, sampling in optical image formation, linear prediction theory, polar and spiral sampling theory, interpolation from nonuniform samples, an extension of Papoulis's generalized sampling expansion to higher dimensions, and applications of sampling theory to optics and to time-frequency representations. The exhaustive bibliography on Shannon sampling theory will make this an invaluable research tool as well as an excellent text for students planning further research in the field.