

1. Record Nr.	UNINA9910963373303321
Titolo	Gabor and wavelet frames / / editors, Say Song Goh, Amos Ron, Zuowei Shen
Pubbl/distr/stampa	Hackensack, NJ, : World Scientific, c2007
ISBN	9786611918712 9781281918710 1281918717 9789812709080 9812709088
Edizione	[1st ed.]
Descrizione fisica	1 online resource (228 p.)
Collana	Lecture notes series, , 1793-0758 ; ; v. 10
Altri autori (Persone)	GohSay Song RonAmos ShenZuowei
Disciplina	515/.723
Soggetti	Gabor transforms Wavelets (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.
Nota di contenuto	CONTENTS; Foreword; Preface; A Guided Tour from Linear Algebra to the Foundations of Gabor Analysis Hans G. Feichtinger, Franz Luef and Tobias Werther; 1. Introduction; 2. Basics in Linear Algebra; 3. Finite Dimensional Gabor Analysis; 4. Frames and Riesz Bases; 5. Gabor Analysis on L2; 6. Time-Frequency Representations; 7. The Gelfand Triple; 8. The Spreading Function; 9. Conclusion and Outlook; References; Some Iterative Algorithms to Compute Canonical Windows for Gabor Frames A. J. E. M. Janssen; 1. Introduction; 2. Overview; 3. Basic Tools; 4. Analysis of Recursion I to Approximate gt 5. Proposing Iterations Without Inversions 5.1. Iterations for gt; 5.2. Iterations for gd; 6. Analysis of Recursion II to Approximate gt; 7. Analysis of Recursion IV to Approximate gd; 8. Summary of Results for Iterations III and V; 9. Concluding Remarks; Acknowledgments; References; Gabor Analysis, Noncommutative Tori and Feichtinger's Algebra Franz Luef; 1. Introduction; 2. Operator Algebras of Time-Frequency Shifts; 3. Noncommutative Tori and Feichtinger's Algebra; 4.

Feichtinger's Algebra as Bimodule for  $C(\cdot)$  and  $C(0)$

5. Application to Gabor Analysis: Biorthogonality Relation of Wexler-

Raz 6. Conclusions; Acknowledgment; References; Unitary Matrix Functions, Wavelet Algorithms, and Structural Properties of Wavelets

Palle E. T. Jorgensen; 1. Introduction; 1.1. Index of terminology in mathematics and in engineering; 1.2. Motivation; 1.2.1. Some points of history; 1.2.2. Some early applications; 2. Signal Processing; 2.1. Filters in communications engineering; 2.2. Algorithms for signals and for wavelets; 2.2.2. Subdivision algorithms; 2.2.3. Wavelet packet algorithms

2.2.4. Lifting algorithms: Sweldens and more 2.3. Factorization theorems for matrix functions; 2.3.1. The case of polynomial functions [the polyphase matrix, joint work with Ola Bratteli]; 2.3.2. General results in mathematics on matrix functions; 2.3.3. Connection between matrix functions and wavelets; 2.3.3.1. Multiresolution wavelets; 2.3.3.2. Generalized multiresolutions [joint work with L. Baggett, K. Merrill, and J. Packer]; 2.3.4. Matrix completion; 2.3.5. Connections between matrix functions and signal processing; Acknowledgments; References

Unitary Systems, Wavelet Sets, and Operator-Theoretic Interpolation of Wavelets and Frames David R. Larson 1. Introduction; 1.1. Talks and abstracts; 1.2. Some background; 1.2.1. Interpolation; 1.2.2. Some basic terminology; 1.2.3. Acknowledgements; 2. Unitary Systems and Wavelet Sets; 2.1. The one-dimensional wavelet system; 2.1.1. Dyadic wavelets; 2.1.2. The dyadic unitary system; 2.1.3. Non-dyadic wavelets in one dimension; 2.2. N dimensions; 2.2.1. The expansive-dilation case; 2.2.2. The non-expansive dilation case; 2.3. Abstract systems; 2.3.1. Restrictions on wandering vectors 2.3.2. Group systems

---

## Sommario/riassunto

Gabor and wavelet analyses have found widespread applications in signal analysis, image processing and many other information-related areas. Both deliver representations that are simultaneously local in time and in frequency. Due to their significance and success in practical applications, they formed some of the core topics of the program "Mathematics and Computation in Imaging Science and Information Processing", which was held at the Institute for Mathematical Sciences, National University of Singapore, from July to December 2003 and in August 2004. As part of the program, tutorial lectures

---