



Time-Frequency Signal Analysis and Processing, Second Edition: A Comprehensive Reference (Eurasip and Academic Press Series in Signal and Image Processing)

By Boualem Boashash

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Time-Frequency Signal Analysis and Processing (TFSAP) is a collection of theory, techniques and algorithms used for the analysis and processing of non-stationary signals, as found in a wide range of applications including telecommunications, radar, and biomedical engineering. This book gives the university researcher and R&D engineer insights into how to use TFSAP methods to develop and implement the engineering application systems they require.

New to this edition:

- New sections on Efficient and Fast Algorithms; a "Getting Started" chapter enabling readers to start using the algorithms on simulated and real examples with the TFSAP toolbox, compare the results with the ones presented in the book and then insert the algorithms in their own applications and adapt them as needed.
- Two new chapters and twenty three new sections, including updated references.
- New topics including: efficient algorithms for optimal TFDs (with source code), the enhanced spectrogram, time-frequency modelling, more mathematical foundations, the relationships between QTFDs and Wavelet Transforms, new advanced applications such as cognitive radio, watermarking, noise reduction in the time-frequency domain, algorithms for Time-Frequency Image Processing, and Time-Frequency applications in neuroscience (new chapter).
- A comprehensive tutorial introduction to Time-Frequency Signal Analysis and Processing (TFSAP), accessible to anyone who has taken a first course in signals

- Key advances in theory, methodology and algorithms, are concisely presented by some of the leading authorities on the respective topics
- Applications written by leading researchers showing how to use TFSAP methods

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Editorial Review

From the Back Cover

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Key features:

- A comprehensive tutorial introduction to Time-Frequency Signal Analysis and Processing (TFSAP), accessible to anyone who has taken a first course in signals;
- Key advances in theory, methodology and algorithms, are concisely presented by some of the leading authorities on the respective topics;
- Applications written by leading researchers showing how to use TFSAP methods.

About the Author

Boualem Boashash (IEEE Fellow '99') is a Scholar, Professor and Senior Academic with experience in 5 leading Universities in France and Australia and 2 universities in the Middle-East. He has published over 500 technical publications, including over 100 journal papers, 3 books and 3 text-books covering Engineering, Applied Mathematics and Medicine. He was an early pioneer of the field of Time-Frequency Signal Processing and he is currently working on the further development of time-frequency theory and medical applications covering mental health and neurosciences with focus on newborn EEG analysis as well as ECG, HRV and fetal movements for improving health outcomes. Among many initiatives, he founded ISSPA, a leading conference since 1985 and its sister workshop WOSSPA. After founding a leading research group at The University of Queensland, he became the Foundation Professor and Director of the Signal Processing Research Centre at the Queensland University of Technology, Brisbane, Australia (1991-2005). He then became the Dean of Engineering at the University of Sharjah, United Arab Emirates (2006-2009) then Associate Dean, Academic at Qatar University and finally a Research Professor. In addition to the teaching,

research and management experience, he also has 3 years industrial experience with Elf-Aquitaine in France at the beginning of his career. He is currently Professor at Qatar University, Department of Electrical Engineering, and the leader of a Biomedical Signal Processing group at the School of Medicine, University of Queensland, Brisbane, Australia. He also developed the first software package for time-frequency signal analysis and processing (TFSAP) regularly updated with his co-workers and used by hundreds of researchers around the world. His work has been cited over 10,000 times.

Professor Boashash was a member of ICASSP board, associate editor for the IEEE transactions on signal processing and he is currently a member of the Board of the Elsevier journal Digital Signal Processing.

Users Review

From reader reviews:

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