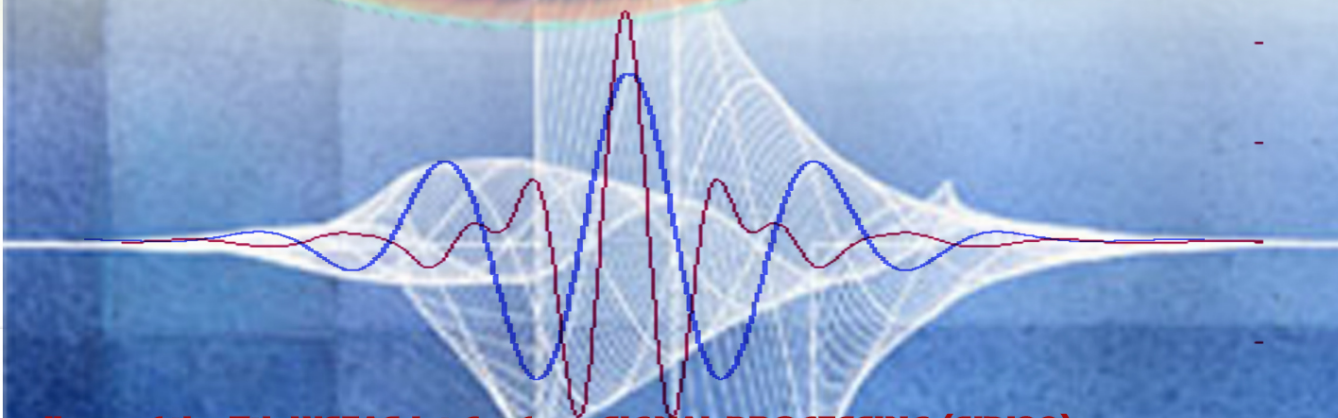
Electrical and Computer Engineering Series
A Series of Reference Books and Textbooks

NEW ASPECTS OF SIGNAL PROCESSING AND WAVELETS

Published by WSEAS Press: www.wseas.org



Proceedings of the 7th WSEAS Int.Conf. on SIGNAL PROCESSING (SIP'08).

Proceedings of the 2nd WSEAS Int. Symposium on WAVELETS THEORY & APPLICATIONS in Applied Mathematics, Signal Processing & Modern Science (WAV '08)

Istanbul, Turkey, May 27-30, 2008

ISBN: 978-960-6766-66-4
ISSN: 1790-5117

Editors:
Prof. Metin Demiralp, Istanbul Technical University, Istanbul, TURKEY
Prof. Wasfy B. Mikhael, University of Central Florida, USA
Prof. Amaury A. Caballero, Florida International University, USA
Prof. Nicolas Abatzoglou, Universit de Sherbrooke, CANADA
Prof. M. Nasseh Tabrizi, Univesity of East Carolina University, USA
Prof. Remi Leandre, Universite de Bourgogne, FRANCE
Prof. Maria I. Garcia-Planas, Universitat Politecnica de Catalunya, SPAIN
Prof. Ryszard S. Choras, University of Technology & Life Sciences, POLAND

NEW ASPECTS OF SIGNAL PROCESSING and WAVELETS

Proceedings of the 7th WSEAS International Conference on SIGNAL PROCESSING (SIP'08).

Proceedings of the 2nd WSEAS International Symposium on WAVELETS THEORY & APPLICATIONS in Applied Mathematics, Signal Processing & Modern Science (WAV '08).

Istanbul, Turkey, May 27-30, 2008

Electrical and Computer Engineering Series
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

ISBN: 978-960-6766-66-4
ISSN: 1790-5117

NEW ASPECTS OF SIGNAL PROCESSING and WAVELETS

Proceedings of the 7th WSEAS International Conference on SIGNAL PROCESSING (SIP'08).

Proceedings of the 2nd WSEAS International Symposium on WAVELETS THEORY & APPLICATIONS in Applied Mathematics, Signal Processing & Modern Science (WAV '08).

Istanbul, Turkey, May 27-30, 2008

Electrical and Computer Engineering Series
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

Copyright © 2008, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: http://www.worldses.org/review/index.html

ISBN: 978-960-6766-66-4
ISSN: 1790-5117

World Scientific and Engineering Academy and Society

NEW ASPECTS OF SIGNAL PROCESSING and WAVELETS

Proceedings of the 7th WSEAS International Conference on SIGNAL PROCESSING (SIP'08).

Proceedings of the 2nd WSEAS International Symposium on WAVELETS THEORY & APPLICATIONS in Applied Mathematics, Signal Processing & Modern Science (WAV '08).

Editors:
Prof. Metin Demiralp, Istanbul Technical University, Istanbul, TURKEY
Prof. Wasfy B. Mikhael, University of Central Florida, USA
Prof. Amaury A. Caballero, Florida International University, USA
Prof. Nicolas Abatzoglou, Universitı de Sherbrooke, CANADA
Prof. M. Nasseh Tabrizi, Univesity of East Carolina University, USA
Prof. Remi Leandre, Universite de Bourgogne, FRANCE
Prof. Maria I. Garcia-Planas, Universitat Politecnica de Catalunya, SPAIN
Prof. Ryszard S. Choras, University of Technology & Life Sciences, POLAND

International Program Committee Members:

Elsayed Atlam, JAPAN
Caner Akuner, TURKEY
Ognjen Kuljaca, UNITED STATES
Muhammed A. Ibrahim, IRAQ
Ismail Temiz, TURKEY
Bahadtin Ruzgar, TURKEY
Mawahib Sulieman, UNITED ARAB EMIRATES
Hossein Shayeghi Moghanlou, IRAN
Abdullah Mamun, SINGAPORE
Keylan Alimhan, JAPAN
Luminita Giurgiu, ROMANIA
Andreas Terzis, GREECE
Onsen Toygar, TURKEY
Sina Khorasani, IRAN
Stefania Popadiuc, ROMANIA
Refik Samet, TURKEY
Mehmet Onder Efe, TURKEY
Francklin Rivas, VENEZUELA
Addison Rios-Bolivar, VENEZUELA
Victoria Rodellar, SPAIN
Mehmet Hakan Karaata, KUWAIT
Ichirou Takahashi, JAPAN
Kai Li, CHINA
Hwang-Cherng Chow, TAIWAN
Georgi Gluhchev, BULGARIA
Francesco Muzi, ITALY
Sajjad Mohsin, PAKISTAN
Yong Woo Lee, KOREA
Nasser Shahtahmasebi, IRAN
Saeed-Reza Sabbagh-Yazdi, IRAN
Frangiskos Topalis, GREECE
Boumchedda Khaled, ALGERIA
Kalle Kantola, FINLAND
Ismail Musirin, MALAYSIA
Helen Catherine Leligou, GREECE
Slobodan Babic, CANADA
Lambros Ekonomou, GREECE
Nam Tran, AUSTRALIA
Dorin Cismasiu, ROMANIA
Pooia Lalbakhsh, IRAN
Shabiul Islam, MALAYSIA
Florin Dragan, ROMANIA
Pelin Yildiz, TURKEY
Stelios Zimeras, GREECE
Rafic Bachnak, UNITED STATES
Hong-Tzer Yang, TAIWAN
Norman Mariun, MALAYSIA
Oscar Camacho, VENEZUELA
Chang-Biau Yang, TAIWAN
Sylvia Encheva, NORWAY
Rafic Bachnak, UNITED STATES
Samir Nejim, TUNISIA
Nicolae Popoviciu, ROMANIA
Yaw-Ling Lin, TAIWAN
PooGyeon Park, KOREA
Dana Petcu, ROMANIA
Yoonsik Choe, KOREA
Ioan Salomie, ROMANIA
Abdel-Latif Elshafei, EGYPT
Baki Koyuncu, TURKEY
Ouahdi Dris, ALGERIA
Zakir Husain, IRAN
Krishna Busawon, UNITED KINGDOM
Metin Demiralp, Istanbul Turkey
Abdulbaki Baykara, Istanbul Turkey
Alper Tunga, Istanbul Turkey
Abdullah Altin, Ankara Turkey
Ogun Dogru, Ankara Turkey
Ekrem Duman, Istanbul TurkeyBurcu Tunga, Istanbul Turkey
Irem Yaman, Istanbul Turkey
Sevda Uskuplu, Istanbul Turkey

Preface

This book contains the proceedings of the WSEAS International Conference on SIGNAL PROCESSING (SIP'08) and the 2nd WSEAS International Symposium on WAVELETS THEORY & APPLICATIONS in Applied Mathematics, Signal Processing & Modern Science (WAV '08) which were held in Istanbul, Turkey, May 27-30, 2008. These conferences aim to disseminate the latest research and applications in Mathematical Wavelet Analysis, Wavelet Transforms, Multirate Filter Banks, Subband Filtering Schemes, Regularity, Moments and Wavelet System Design, Biorthogonal Wavelets, Multiplicity, Wavelets and Multilevel Approximation, Signal Processing, Image Processing, Video processing.

The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from **http://www.wseas.org/reports**. Your feedback encourages the society to go ahead as you can see in **http://www.worldses.org/feedback.htm**

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: **www.worldses.org/indexes**

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in these conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, ACM, Compendex, INSPEC, CSA .... see: www.worldses.org/indexes) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

Finally, we cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.

Table of Contents

Plenary Lecture I: Image Compression Mathods - A Survey **10**
Ryszard S. Choras

Part I: Signal Proceesing

Flexible Archiving of Old Handwritten Documents **13**
Roumen Kountchev, Vladimir Todorov, Roumiana Kountcheva

Extended Kalman Filter for Parameter Estimation of Wideband polynomial Phase Signals in Sensors Arrays **19**
A. Ouldali, S. Sadoudi, Z. Messaoudi

Arbitrary Image Scaling using a Filter Bank with Raised Cosine Function based Sampling Kernels **25**
J.Y. Kim, K.J. Kim and S.W. Nam

Assessment of Fatigue Damage Features in a Piping System Using Signal Processing Approach **29**
S. Abdullah, M. Loman, N. Jamaluddin, A. Arifin, Z. Mohd Nopiah and M. Z. Nuawi

Wavelets in the Faraday Experience **34**
Carlos Lizarralde

Recognizing Faces under Facial Expression Variations and Partial Occlusions **37**
Tiwuya H. Faaya and Onsen Toygar

Identification of a linear time-varying system using Haar wavelet **43**
S.J. Park, K.J. Kim, and S.W. Nam

Road Analysis Based On Texture Similarity Evaluation **47**
Dan Popescu, Radu Dobrescu, Daniel Merezeanu

Siren Noise Attenuation by Non-linear Processing of Time-Frequency Information **52**
Hamid Sepehr, Masoud Ahmadi and Paul Brennan

Adaptive Spectral Shaping Using LP Filter Decomposition to Improve Perceptual Quality of Coded Speech **58**
Hassan Farsi

Segmentation and Scattering of Fatigue Time Series Data by Kurtosis and Root Mean Square **64**
Z. M. Nopiah1, M. I. Khairir and S. Abdullah

Test and Evaluation Time-Inverse Over-Current Protection Algorithm Using SIMULINK **69**
David Campos, Edgar Moreno, Domingo Torres

ISBN: 978-960-6766-66-4

ISSN: 1790-5117

Content-Based Image Retrieval Based on Rectangular Segmentation **75**
Chan-Fong Wong and Chi-Man Pun

Biometric Recognition Using Hand Geometry **81**
Gulden Ozbay, Nurdal Watsuji

A traffic accident surveillance camera system through sound analysis based on frequency information **86**
Jaejoon Kim, Daegyu Lee

Real-Time Differentiation of the Multi-Dimensional Sampled Functions **93**
Bogusław Cyganek

Shape-based Image Retrieval **99**
Ryszard S. Choras

A Comparison of Chebyshev I and Chebyshev II Filter Applied For Noise Suppression in ECG Signal **105**
Mahesh S. Chavan, R. A. Agarwala, M.D.Uplane

Rectangular Window for Interference Reduction in ECG **110**
Mahesh S. Chavan, R. A. Agarwala, M.D.Uplane

An Improved Realization Of The Chua's Circuit Using Rc-Op Amps **115**
Aziz Tadayon1, C. Aissi2 ,D. Kazakos

Error Bounds in Parameter Estimation Under Mismatch **119**
Aziz Tadayon, D.Kazakos

Robust Companders **123**
Aziz Tadayon, Demetrios Kazakos

Vehicle Number Plate Recognition Using Hybrid Mathematical Morphological Techniques **127**
Humayun Karim Sulehria, Ye Zhang, Danish Irfan, Atif Karim Sulehria

A Numerical Filter Based on an Adaptive Wiener Filter **134**
Khuanjai Nachaiyaphum, Sarawut Sujitjorn and Supakorn Rakmai

The Loss of Down Converter for Digital Radar receiver **140**
Youn-Hui Jang, Hyun-Ik Shin, Bum-Suk Lee, Jeong-Hwan Kim, Whan-Woo Kim

Mixed Image Separation Using FastICA **145**
Arti Khaparde, M. Madhavilatha, M.B.L.Manasa, P.Anil Babu, S.Pradeep Kumar

Part II: Wavlets Theory & Applicatoins

ISBN: 978-960-6766-66-4

ISSN: 1790-5117

Radar: signal analysis during operation time using wavelets **152**
E. Serrano, R.O. Sirne, M. Fabio, A. Viegener, C.E. D'attellis and J. Guglielmone

Contourlet-Based Image Fusion using Information Measures **157**
Shirin Mahmoudi

New Approach to Orthogonal Multiplierless Wavelet Family Synthesis **163**
Piotr Lipinski, Mykhaylo Yatsymirskyy

Effects of Diurnal Variation on a Tropical Coupling System: A 2-Dimensional Coupled Ocean-Cloud Resolving Atmosphere Modeling Study **167**
Shouting Gao, Yushu Zhou

Texture Description using Different Wavelet Transforms Based on Statistical Parameters **174**
U.S.N.Raju, V. Vijaya Kumar, A.Suresh, M.Radhika Mani

A Single-Phase Grid-Connected Pv System With Active Power Filter **179**
Kleber C. A. De Souza, Denizar C. Martins

Laser Raman-Spectroscopy of GaP Surfaces Modified by Ar^+ B^+ and Al^+ Ion Implantation **186**
Sergo V. Gotoshia and Lamara V. Gotoshia

Study of Meteorological Parameters of Coastal Regions of Saudi Arabia Using Wavelets **195**
S. Rehman and M. El-Gebeily

Author Index **201**

ISBN: 978-960-6766-66-4

ISSN: 1790-5117

Plenary Lecture I

Image Compression Mathods - A Survey

Professor Ryszard S. Choras
Institute of Telecommunications,
University of Technology & Life Sciences,
S. Kaliskiego 7,
85-792 Bydgoszcz,
POLAND
E-mail: choras@utp.edu.pl

Brief biography of the speaker: Ryszard S. Choras received the MSc degree in electronics engineering and the PhD degree in computer engineering both from the Faculty of Electronic of the Technical University of WrocA,aw, Poland, in 1973, and 1981, respectively. He received DSc (habilitation) in computer science from the Faculty of Electronics of the Technical University of Warsaw in 1993. He is currently Professor in the Institute of Telecommunications of the University of Technology & Life Sciences, Bydgoszcz, Poland. His research experience covers image processing and analysis, image coding, feature extraction and computer vision. At present, he is working in the field of image retrieval and indexing, mainly in low- and high-level features extraction and knowledge extraction in CBIR systems. He is the author of Computer Vision. Methods of Image Interpretation and Identification (2005) and more than 143 articles in journals and conference proceedings. He is the member of the Polish Cybernetical Society, Polish Neural Networks Society, IASTED, and the Polish Image Processing Association. Recent publications: Integrated color, texture and shape information for content-based image retrieval-Pattern Analysis and Applications (2007) 10:333-343; Fuzzy Approach for Image Retrieval-Pattern Recognition and Image Analysis, vol.17, no2, 259-267,2007; CBIR Based on Color and Low-level Texture Features - IASTED SPPRA Int. Conf., Feb 2007, 259-263; Image Retrieval using Color, Texture and Wavelet Transform Moments - in Advances in Pattern Recognition ed. P. Pal, pp. 256-262, World Scientific Press, 2007; Feature extraction for CBIR and Biometrics applications - &th WSEAS Conf. on Applied Computer Science, pp.1-9, Venice, 2007 (also PLENARY SPEAKER) .

ISBN: 978-960-6766-66-4

ISSN: 1790-5117

Abdullah S. 29, 64
Agarwala R. A. 105, 110
Ahmadi M. 52
Aissi C. 115
Anil Babu P. 145
Arifin A. 29
Brennan P. 52
Campos D. 69
Chavan M. S. 105, 110
Choras R. S. 99
Cyganek B. 93
D'attellis C.E. 152
De Souza K. C. A. 179
Dobrescu R. 47
El-Gebeily M. 195
Faaya T. H. 37
Fabio M. 152
Farsi H. 58
Gao S. 167
Gotoshia L. V. 186
Gotoshia S. V. 186
Guglielmone J. 152
Irfan D. 127
Jamaluddin N. 29
Jang Y. H. 140
Kazakos D. 115, 119, 123
Khairir M. I. 64
Khaparde A. 145
Kim J. 86
Kim J. H. 140
Kim J.Y. 25
Kim K.J. 25, 43
Kim W. W. 140
Kumar Vijaya V. 174
Lee B. S. 140
Lee D. 86
Lipinski P. 163
Lizarralde C. 34
Loman M. 29
Madhavilatha M. 145
Mahmoudi S. 157
Manasa M.B.L. 145
Martins D. C. 179
Merezeanu D. 47
Messaoudi Z. 19
Moreno E. 69
Nachaiyaphum K. 134
Nam S.W. 25, 43
Nopiah Z. M. 29, 64
Nuawi M. Z. 29
Ouldali A. 19
Ozbay G. 81
Park S.J. 43
Popescu D. 47
Pradeep Kumar S. 145
Pun C. M. 75
Radhika Mani M. 174
Raju U. S. N. 174
Rakmai S. 134
Rehman S. 195
Sadoudi S. 19
Sepehr H. 52
Serrano E. 152
Shin H. I. 140
Sirne R.O. 152
Sujitjorn S. 134
Sulehria A. K. 127
Sulehria H. K. 127
Suresh A. 174
Tadayon A. 115, 119, 123
Torres D. 69
Toygar O. 37
Uplane M. D. 105, 110
Viegener A. 152
Watsuji N. 81
Wong C. F. 75
Yatsymirskyy M. 163
Zhang Y. 127
Zhou Y. 167