



Editors: Alexander Zemliak, Nikos Mastorakis

Recent Advances in Circuits, Systems, Signal and Telecommunications



**5th WSEAS International Conference on Circuits,
Systems, Signal and Telecommunications (CISST '11)**

Puerto Morelos, Mexico, January 29-31, 2011

**ISSN: 1792-779X
ISBN: 978-960-474-271-4**

Recent Advances in Circuits, Systems, Signal and Telecommunications





RECENT ADVANCES in CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS

**5th WSEAS International Conference on CIRCUITS, SYSTEMS,
SIGNAL and TELECOMMUNICATIONS (CISST '11)**

**Puerto Morelos, Mexico
January 29-31, 2011**

RECENT ADVANCES in CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS

**5th WSEAS International Conference on CIRCUITS, SYSTEMS,
SIGNAL and TELECOMMUNICATIONS (CISST '11)**

**Puerto Morelos, Mexico
January 29-31, 2011**

Published by WSEAS Press
www.wseas.org

Copyright © 2011, 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>

ISSN: 1792-779X
ISBN: 978-960-474-271-4



World Scientific and Engineering Academy and Society

RECENT ADVANCES in CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS

**5th WSEAS International Conference on CIRCUITS, SYSTEMS,
SIGNAL and TELECOMMUNICATIONS (CISST '11)**

**Puerto Morelos, Mexico
January 29-31, 2011**

Editors:

Prof. Alexander Zemliak, Autonomous University of Puebla, MEXICO

Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA

International Program Committee Members:

Alexander Zemliak, MEXICO

Weilian Su, USA

Gorazd Kandus, SLOVENIA

AbdulRahman Al-Othman, KUWAIT

Chandra Sekhar Paidimarry, INDIA

Yuan-shyi peter Chiu, TAIWAN

Guergana Mollova, AUSTRIA

Zhao zhengjie Zhang jilong, CHINA

Irma Siller-Alcala, MEXICO

Masoud Saeed, IRAN

Mikhail Arkhipov, MEXICO

Yumi Takizawa, JAPAN

Ciprian Racuciu, ROMANIA

Singa wang Chiu, TAIWAN

Kanwarjit singh Sandhu, INDIA

George Szentirmai, USA

Michael Peter Kennedy, IRELAND

Paresh C. Sen, CANADA

Michel Gevers, BELGIUM

James S. Thorp, USA

Irwin W. Sandberg, USA

Asad A. Abidi, USA

Andreas Antoniou, USA

Antonio Cantoni, AUSTRALIA

Lotfi Zadeh, USA

Armen H. Zemanian, USA

Guanrong Chen, HONG KONG

Edgar Sanchez-Sinencio, USA

Jim C. Bezdek, USA

A. J. van der Schaft, the NETHERLANDS

Istvan Nagy, Hungary

Wasfy B. Mikhael, USA

M. N. S. Swamy, CANADA

M. Araki, JAPAN

Abbas El Gamal, USA

Franco Maloberti, Italy

Alan N. Willson Jr., USA

Yoji Kajitani, JAPAN

Mohammed Ismail, USA

Kemin Zhou, USA

Ruey-Wen Liu, USA

Nabil H. Farhat, USA

John I. Sewell, UK

Jerry M. Mendel, USA

Magdy A. Bayoumi, USA

Bertram E. Shi, HONG KONG

M. Omair Ahmad, CANADA

N. K. Bose, USA

Igor Lemberski, LATVIA

Alfred Fettweis, GERMANY

Brockway McMillan, USA

H. J. Orchard, USA

Jacob Katzenelson, ISRAEL

Vincent Poor, USA

Abraham Kandel, USA

Bor-Sen Chen, CHINA

C. S. George Lee, USA

Hamid R. Berenji, USA

Kevin M. Passino, USA

Lawrence O. Hall, USA

Ronald R. Yager, USA

Witold Pedrycz, CANADA

Agoryaswami J. Paulraj, USA

Ahmed H. Tewfik, USA

Alan V. Oppenheim, USA

Alfonso Farina, ITALY

Alfred O. Hero, USA

Ali H. Sayed, USA

Anders Lindquist, SWEDEN

Arthur B. Baggeroer, USA

Arye Nehorai, USA

Benjamin Friedlander, USA

Bernard C. Levy, USA

Bhaskar D. Rao, USA

Bin Yu, USA

Boualem Boashash, AUSTRALIA

Brian D. O. Anderson, AUSTRALIA

Bruce A. Francis, CANADA

C. Richard Johnson, USA

C. Sidney Burrus, USA

Charles M. Rader, USA

Desmond P. Taylor, NEW ZEALAND

Donald L. Duttweiler, USA

Donald W. Tufts, USA

Douglas L. Jones, USA

Earl E. Swartzlander, USA

Ed F. Deprettere, the NETHERLANDS

Edward A. Lee, USA

Edward J. Powers, USA

Ehud Weinstein, ISRAEL

Eli Brookner, USA

Ezio Biglieri, Italy

Faye Boudreaux-Bartels, USA

Georgios B. Giannakis, USA

Gonzalo R. Arce, USA

H. Vincent Poor, USA

Hagit Messer, ISRAEL

Joos Vandewalle, BELGIUM

Jose C. Principe, USA

Jose M. F. Moura, USA

K. J. Ray Liu, USA

Kaushik Roy, USA

Kenneth Rose, USA

Keshab K. Parhi, USA

Kon Max Wong, CANADA

Kung Yao, USA

Louis L. Scharf, USA
Martin Vetterli, USA
Mati Wax, USA
Meir Feder, ISRAEL
Michael C. Wicks, USA
Michael D. Zoltowski, USA
Michael T. Orchard, USA
Michael Unser, SWITZERLAND
Miguel Angel Lagunas, SPAIN
Moeness G. Amin, USA
Mohamed Najim, FRANCE
Neil J. Bershad, USA
P. P. Vaidyanathan, USA
Patrick Dewilde, NETHERLANDS
Peter Willett, USA
Petre Stoica, SWEDEN
Phillip A. Regalia, FRANCE
Pierre Duhamel, FRANCE
Pierre Moulin, USA
Pramod K. Varshney, USA
Rabab Kreidieh Ward, CANADA
Robert M. Gray, USA
Rolf Unbehauen, GERMANY
Ronald W. Schafer, USA
Rui J. P. Figueiredo, USA
Russell M. Mersereau, USA
Sadaoki Furui, JAPAN
Shun-Ichi Amari, JAPAN
Simon Haykin, CANADA
Soo-Chang Pei, CHINA
Soutra Dasgupta, USA
Stefan L. Hahn, POLAND
Steven Kay, USA
Takao Hinamoto, JAPAN
Takashi Matsumoto, JAPAN
Tapio Saramaki, FINLAND
Tariq S. Durrani, U.K.
Thomas F. Quatieri, USA
Thomas L. Marzetta, USA
Thomas S. Huang, USA
Thomas W. Parks, USA
Uri Shaked, ISRAEL
V. John Mathews, USA
Vladimir Cuperman, USA
William A. Pearlman, USA
Wolfgang Fichtner, SWITZERLAND
Wu-Sheng Lu, CANADA
Yaakov Bar-Salom, USA
Yingbo Hua, USA
Yong Ching Lim, SINGAPORE
Yoram Bresler, USA
Zhi Ding, USA
A. A. Goldenberg, CANADA
Angel Rodriguez-Vasquez, SPAIN
Erol Gelenbe, USA
F. L. Lewis, USA
Harry Wechsler, USA
Howard C. Card, CANADA
Lei Xu, P. R. CHINA
Leon O. Chua, USA
Marco Gori, ITALY
Narasimhan Sundararajan, SINGAPORE
Sankar K. Pal, India
Tamas Roska, USA
A. Stephen Morse, USA
Alberto Isidori, USA
Ali Saberi, USA
Andrew R. Teel, USA
Antonio Vicino, ITALY
Anuradha M. Annaswamy, USA
Benjamin Melamed, USA
Bruce H. Krogh, USA
David D. Yao, USA
Donald Towsley, USA
Eduardo D. Sontag, USA
Edward J. Davison, CANADA
G. George Yin, USA
Giorgio Picci, ITALY
Graham C. Goodwin, AUSTRALIA
Han-Fu Chen, CHINA
Harold J. Kushner, USA
Hidenori Kimura, JAPAN
Ian Postlethwaite, UK
Ian R. Petersen, AUSTRALIA
Jan C. Willems, NETHERLANDS
Jim S. Freudenberg, USA
Karl Johan Astrom, SWEDEN
Lennart Ljung, SWEDEN
M. Vidyasagar, INDIA
Mark W. Spong, USA
Matthew R. James, AUSTRALIA
Munther A. Dahleh, USA
P .R. Kumar, USA
Peter E. Caines, CANADA
Pramod P. Khargonekar, USA
Richard T. Middleton, AUSTRALIA
Roberto Tempo, Italy
Roger W. Brockett, USA
Romeo Ortega, FRANCE
Shankar Sastry, USA
Stephane Lafortune, USA
Steven I. Marcus, USA
T. E. Duncan, USA
Tamer Basar, USA
W. M. Wonham, CANADA
Weibo Gong, USA
Xi-Ren Cao, Hong Kong
Yu-Chi Ho, United Kingdom
Ibrahim Al-Bahadly, NEW ZEALAND
Saad Al-Shahrani, SAUDI ARABIA
Shuangching Chen, JAPAN
Eunmi Choi, KOREA
YounOk Choi, KOREA
Yung-shan Chou, TAIWAN

Chin-tun Chuang, TAIWAN
Algimantas Citavicius, LITHUANIA
Lawrence Deng, TAIWAN
Octavian Dranga, AUSTRALIA
Chen-chien Hsu, TAIWAN
Gorazd Kandus, SLOVENIA
Seokjoo Koh, KOREA
Pei-Jun Lee, TAIWAN
Jie Li, CHINA
Shieh-Shing Lin, TAIWAN
Ming-chih Lu, TAIWAN
Hsi-Pin Ma, TAIWAN
Vincenzo Niola, ITALY
Nattapong Phanthuna, THAILAND
Harsh Sadawarti, INDIA
Dat Tran, AUSTRALIA
Jih-Fu Tu, TAIWAN
Ti-ho Wang, TAIWAN
Wei-yen Wang, TAIWAN
Chin-Long Wey, TAIWAN
Yanlei Zhao, CHINA

Preface

This year the 5th WSEAS International Conference on CIRCUITS, SYSTEMS, SIGNAL and TELECOMMUNICATIONS (CISST '11) was held in Puerto Morelos, Mexico, January 29-31, 2011. The conference remains faithful to its original idea of providing a platform to discuss molecular electronics, molecular computing, metabolic networks, microelectronics, optoelectronic devices, laser and optical systems, amplifiers, non-linear circuits, semiconductors, logic synthesis, digital filters, superconductivity circuits, video technologies, systems theory, robotics, hybrid systems, hierarchical control, man-machine interaction, cybernetics, microprocessors, unmanned vehicles, signal reconstruction, broadband audio coding, evolutionary computation, microwave theory and techniques, microwave superconductivity, antennas, diffraction, applied electromagnetics, aerospace systems etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

Real-Time Digital Oscilloscope Implementation in 90nm CMOS Technology FPGA	13
<i>Nasir Mehmood, Jens Ogniewski, Vinodh Ravinath</i>	
Microcontroller based Closed-Loop Automatic Speed Control of DC Motor using PWM	18
<i>I. Moazzem, S. Rahman, M. A. Matin</i>	
A Design of Parameter Optimal Iterative Learning Control for Linear Discrete-Time Systems	22
<i>Wataru Kase</i>	
Wall Climbing Robot: Mechanical Design and Implementation	28
<i>A. Albagul, A. Asseni, O. Khalifa</i>	
Graph Method for Solving Switched Capacitors Circuits	33
<i>Bohumil Brtnik</i>	
Isolated Word Recognition based on Intelligent Segmentation by Using Hybrid HTD-HMM	38
<i>A. Reza Kazemi, B. Bahram Ehsandoust, C. Alborz Rezazadeh, D. Shahrokh Ghaemmaghami</i>	
Utilizing Intelligent Segmentation in Isolated Word Recognition Using a Hybrid HTD-HMM	42
<i>R. Kazemi, A. Rezazadeh Sereshkeh, B. Ehsandoust</i>	
Performance Studies of Antenna Pattern Design using the Minimax Algorithm	50
<i>James Jen, Meng Qian, Zekeriya Aliyazicioglu, H. K. Hwang</i>	
Digital Architecture for a Median Filter of Image Based on Sorting Network	56
<i>Victor Jim Enez-Fernandez, Carlos Ventura-Arizmendi, Denisse Martinez-Navarrete, Francisco Gonza Lezmartinez</i>	
Responses of Semiconductor Arrays due to Photon Absorption	60
<i>Ahmad Barzkar</i>	
HHT-Based Time-Frequency Analysis Method for Biomedical Signal Applications	65
<i>Chin-Feng Lin, Jin-De Zhu</i>	
Sensorless Speed Non Linear Control of Induction Motor	69
<i>Chouya Ahmed, Mansouri Abdellah, Chenafa Mohammed</i>	
LabVIEW Visualization For Inductive Sensors Used In Shaping Control of A Segmented Reflector Test Bed	76
<i>Alok Desai, Jessica Alvarenga, Harshit Tarsaria, Khosrow Rad, Helen R. Boussalis</i>	
Ray Tracing Visualization for Precision Pointing Architecture of A Segmented Reflector Testbed Using LabVIEW	81
<i>Alok Desai, Jessica Alvarenga, Harshit Tarsaria, Khosrow Rad, Helen R. Boussalis</i>	
Generalized Methodology for Analog Network Optimization	87
<i>Alexander Zemliak, Ricardo Pena, Eduardo Rios</i>	

Analysis and Optimization of a DAR IMPATT Diode for 330 GHz	95
<i>Alexander Zemliak, Andrey Ostrovsky, Sergio Vergara, Evgeniy Machuskiy</i>	
A Design Method for USBL Systems with Skew Three-Element Arrays	102
<i>Mikhail Arkhipov</i>	
A Low Voltage and Low Power Electronically Tunable Resistor with Positive, Negative, Linear and Nonlinear I-V Characteristics	108
<i>Roshanak Alavifard, Mohammad Pooyan</i>	
Influence of the Speech Quality in Telephony on the Automated Speaker Recognition	115
<i>Robert Blatnik, Gorazd Kandus, Tomaz Sef</i>	
Digital Distance Relay Reliability Enhancement Using Real-Time Filter	121
<i>Abderrahmane Ouadi, Hamid Bentarzi, Jean Claude Maun</i>	
Authors Index	127

Authors Index

Abdellah, M.	69	Machuskiy, E.	95
Ahmed, C.	69	Martinez-Navarrete, D.	56
Alavifard, R.	108	Matin, M. A.	18
Albagul, A.	28	Maun, J. C.	121
Aliyazicioglu, Z.	50	Mehmood, N.	13
Alvarenga, J.	76, 81	Moazzem, I.	18
Arkipov, M.	102	Mohammed, C.	69
Asseni, A.	28	Ogniewski, J.	13
Barzkar, A.	60	Ostrovsky, A.	95
Bentarzi, H.	121	Ouadi, A.	121
Blatnik, R.	115	Pena, R.	87
Boussalis, H. R.	76, 81	Pooyan, M.	108
Brtnik, B.	33	Qian, M.	50
Desai, A.	76, 81	Rad, K.	76, 81
Ehsandoust, B.	38, 42	Rahman, S.	18
Enez-Fernandez, V. J.	56	Ravinath, V.	13
Ghaemmaghami, D. S.	38	Rezazadeh, A.	38, 42
Hwang, H. K.	50	Rios, E.	87
Jen, J.	50	Sef, T.	115
Kandus, G.	115	Tarsaria, H.	76, 81
Kase, W.	22	Ventura-Arizmendi, C.	56
Kazemi, R.	38, 42	Vergara, S.	95
Khalifa, O.	28	Zemliak, A.	87, 95
Lezmartinez, F. G.	56	Zhu, J.-D.	65
Lin, C.-F.	65		