



ADVANCES IN MICROELECTRONICS, NANO-ELECTRONICS AND OPTOELECTRONICS

Editors:

Prof. Metin Demiralp, Istanbul Technical University, Turkey
Prof. N. H. Baykara, Marmara University, Istanbul, Turkey
Prof. N. E. Mastorakis, Technical University of Sofia, Bulgaria
& Hellenic Naval Academy, Greece

Associate Editors:

Gheorghe Manolea (Romania)
Giulia Sturza (Georgia)
Monika Leba (Romania)
Liang Zhou (China)



ADVANCES IN MICROELECTRONICS, NANO-ELECTRONICS & OPTOELECTRONICS

Proceedings of the 8th WSEAS International Conference on
MICROELECTRONICS, NANO-ELECTRONICS, OPTOELECTRONICS
(MINO '09)

Istanbul, Turkey, May 30 - June 1, 2009

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

ISBN: 978-960-474-085-7
ISSN: 1790-5117

Published by WSEAS Press
www.wseas.org



ADVANCES in MICROELECTRONICS, NANOELECTRONICS and OPTOELECTRONICS

**Proceedings of the 8th WSEAS International Conference on
Microelectronics, Nanoelectronics, Optoelectronics (MINO '09)**

**Istanbul, Turkey,
May 30 - June 1, 2009**

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

Published by WSEAS Press
www.wseas.org

ISSN: 1790-5117
ISBN: 978-960-474-085-7

ADVANCES in MICROELECTRONICS, NANOELECTRONICS and OPTOELECTRONICS

**Proceedings of the 8th WSEAS International Conference on
Microelectronics, Nanoelectronics, Optoelectronics (MINO '09)**

**Istanbul, Turkey,
May 30 - June 1, 2009**

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

Published by WSEAS Press
www.wseas.org

Copyright © 2009, 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: 1790-5117
ISBN: 978-960-474-085-7



World Scientific and Engineering Academy and Society

**ADVANCES in
MICROELECTRONICS,
NANOELECTRONICS and
OPTOELECTRONICS**

**Proceedings of the 8th WSEAS International Conference on
Microelectronics, Nanoelectronics, Optoelectronics (MINO '09)**

**Istanbul, Turkey,
May 30 - June 1, 2009**

Editors:

Prof. Metin Demiralp, Istanbul Technical University, Turkey

Prof. N. A. Baykara, Marmara University, Istanbul, Turkey

Prof. N.E.Mastorakis, Technical University of Sofia, Bulgaria / and HNA, Greece

Associate Editors:

Gheorghe Manolea (Romania)

Gia Sirbiladze (Georgia)

Monika Leba (Romania)

Liang Zhou (China)

International Program Committee Members:

Gerardo Acosta, SPAIN

Ping An, CHINA

Yuejun An, CHINA

Kiyoshi Akama, JAPAN

Ali Al-dahoud, JORDAN

Yasar Amin, PAKISTAN

Mehrdad Ardebilipour, IRAN

Carlos Aviles-Cruz, MEXICO

Yun Bai AUSTRALIA

Shahid Ikramullah Butt, PAKISTAN

Ana Madureira, PORTUGAL

Alexander Zemliak, MEXICO

Petr Ekel, BRAZIL

Moh'd belal Al-Zoubi, JORDAN

Poorna Balakrishnan, INDIA

Sorin Borza, ROMANIA

Yue-shan Chang, TAIWAN

Alexander Grebennikov, MEXICO

Huay Chang, TAIWAN

Olga Martin, ROMANIA,

Chin-chen Chang, TAIWAN

Chip Hong Chang, SINGAPORE

Sheng-Gwo Chen, TAIWAN

Min-Xiou Chen, TAIWAN

George Antoniou, USA

Tanglong Chen, CHINA

Lotfi Zadeh, USA

Whai-En Chen, TAIWAN

Yuehui Chen, CHINA

Toly Chen, TAIWAN

Michael Wasfy, USA

Ta-Cheng Chen, TAIWAN

C. Manikopoulos, USA

Chin-Mou Cheng, TAIWAN

Yaoyu Cheng, CHINA

Chin-Mou Cheng, TAIWAN

Myeonggil Choi, KOREA

Yuk Ying Chung, AUSTRALIA

Valeri Mladenov, BULGARIA,

Ahmed Dalalah, JORDAN

Andris Buikis, LATVIA

Saeed Daneshmand, IRAN

Metin Demiralp, TURKEY

Chie Dou, TAIWAN

Guolin Duan, CHINA

Manuel Duarte-Mermoud, CHILE

Odysseas Efremides, GREECE

Jose Carlos Quadrado, PORTUGAL

Toshio Eisaka, JAPAN

Odysseas Pyrovolakis, GREECE

Frank Ekpar, JAPAN

Eyas El-Qawasmeh, JORDAN

Alberto Escobar, MEXICO

Kwo-Jean Farn, TAIWAN

Alessandra Flammini, ITALY

Athina Lazakidou, GREECE

Jose-Job Flore-Godoy, MEXICO

Joseph Fong, HONG KONG S.A.R.

Kostas Siasiakos, GREECE

Donata Francescato, ITALY

Tapio Frantti, FINLAND

Georges Fried, FRANCE

Rocco Furferi, ITALY

James Gao, UNITED KINGDOM

Zong Geem, USA

Ahmad Ghanbari, IRAN

Gilson Giralardi, BRAZIL

Panos Pardalos, USA

Wanwu Guo, AUSTRALIA

Sungho Ha, KOREA

Amauri Caballero, USA

Aamir Hanif, PAKISTAN

Iraj Hassanzadeh, IRAN

Nualsawat Hiransakolwong, THAILAND

Rong-Lain Ho, TAIWAN

Seyed Ebrahim Hosseini, IRAN

Wen Hou, CHINA

Shih-Wen Hsiao, TAIWAN

Mingsheng Hu, CHINA

Shyh-Fang Huang, TAIWAN

A. Manikas, UK

Chenn-Jung Huang, TAIWAN

Yu-Jung Huang, TAIWAN

Guo-shing Huang, TAIWAN

Chenn-Jung Huang, TAIWAN
Dil Hussain, DENMARK
Philippe Dondon, FRANCE,
Muhammad Ibrahimy, MALAYSIA
Apostolos Ifantis, GREECE
Shiming Ji, CHINA
Zhang Ju, CHINA
Liu Jun, CHINA
Michael Katchabaw, CANADA
Seong Baeg Kim, KOREA
Jin-tae Kim, KOREA
Young Jun Kim, KOREA
Mallikarjun Kodabagi, INDIA
Vicenzo Niola, ITALY
M. I. Garcia-Planas, SPAIN
Insoo Koo, KOREA
Young-doo Kwon, KOREA
Vincent Lee, AUSTRALIA
Hsien-da Lee, TAIWAN
Weimin Li, CHINA
Qin Li, CHINA
Daoliang Li, CHINA
Bo Li, CHINA
Vitaliy Kluev, JAPAN
Daoliang Li, CHINA
Xiaoyu Li, CHINA
Daoliang Li, CHINA
Aydina Akan, TURKEY
Congqing Li, CHINA
Jie Li, CHINA
Zhu Liehuang, CHINA
S. S. Lin, TAIWAN
Pei-huang Lin, TAIWAN
Chu-Hsing Lin, TAIWAN
S.S.Dlay, UK
Chia-Chen Lin, TAIWAN
Chih-Min Lin, TAIWAN
whei-min Lin, TAIWAN
Shengyou Lin, CHINA
YI Liu, UNITED KINGDOM
Jiang Liu, UNITED STATES
Shi-er Lou, TAIWAN
Shyue-Kung Lu, TAIWAN
Mingfeng Lu, TAIWAN
Addouche Mahmoud, FRANCE
Sunilkumar Manvi, INDIA
Drakoulis Martakos, GREECE
Aurelio Medina, MEXICO
Ravinda Meegama, SRI LANKA
Afif Mghawish, JORDAN
Tetsushi Miki, JAPAN
Zhong Ming, CHINA
Wang Mingquan, CHINA
Hu Mingsheng, CHINA
Guoliang Mo, CHINA
Bartolomeo Montrucchio, ITALY
K. Ioannou, GREECE

Francesco Muzi, ITALY
Mariko Nakano-Miyatake, MEXICO
Sang-Won Nam, KOREA
Hamidullah Khan Niazi, CHINA
Miguel Angel Gomez-Nieto, SPAIN
Yukio Ohsawa, JAPAN
Hasnaoui Othman, TUNISIA
Zeljko Panian, CROATIA (HRVATSKA)
PooGyeon Park, KOREA
Vidyasagar Potdar, AUSTRALIA
Carlos G. Puntonet, SPAIN
Maria Rizzi, ITALY
M. Bisiacco, ITALY
Chen Rong-chang, TAIWAN
Poornachandra Sanjeeva, INDIA
Mostafa Sedighzadeh, IRAN
J.N. Sheen, TAIWAN
Sangmun Shin, KOREA
Li Shuhong, CHINA
Yu Shunkun, CHINA
Andrzej Sluzek, SINGAPORE
Hokeun Song, KOREA
Paulo Sousa, PORTUGAL
Sarawut Sujitjorn, THAILAND
Yi Sun, CHINA
Guangzhong Sun, CHINA
Yoshihiro Tanada, JAPAN
Lixin Tao, USA
Nam Tran, AUSTRALIA
Argyrios Varonides, USA
Peter Trkman, SLOVENIA
Lamberto Tronchin, ITALY
Amritasu Sinha, INDIA
Ming-Jer Tsai, TAIWAN
Woei-Jiunn Tsaur, TAIWAN
Kuo-Hung Tseng, TAIWAN
Hiroshi Umeo, JAPAN
Ronald Yager, USA
Pragya Varshney, INDIA
Lusheng Wang, HONG KONG S.A.R.
Lei Wang, CHINA
Zhongfei Wang, CHINA
Hironori Washizaki, JAPAN
Wang Wen, CHINA
Kin Yeung Wong, MACAU S.A.R.
Jyh-Yang Wu, TAIWAN
Hsiaokuang Wu, TAIWAN
Yinshui Xia, CHINA
Yi Xie, CHINA
Xinli Xu, CHINA
Yong Xu, CHINA
Yinlong Xu, CHINA
Xinli Xu, CHINA
Bin Xu, CHINA
Hongwen Yan, CHINA
Hung-Jen Yang, TAIWAN
Thomas Yang, USA

Hung-Jen Yang, TAIWAN
Houjun Yang, CHINA
Hsieh-Hua Yang, CHINA
Wenrong Yang, CHINA
Hung-Jen Yang, TAIWAN
Sumanth Yenduri, USA
Alimujiang Yiming, JAPAN
Jianfei Yin, CHINA
Liuguo Yin, CHINA
Ren Yong Feng, CHINA
Tetsuya Yoshida, JAPAN
Hsiang-fu Yu, TAIWAN
S.Y.Chen, GERMANY
Longjiang Yu, CHINA
Kiyun Yu, KOREA
Costin Cepisca, ROMANIA
Enzhe Yu, KOREA
Chang Nian Zhang, CANADA
Jianwei Zhang, GERMANY
Wendong Zhang, CHINA
Jianjun Zhang, CHINA
Camelia Ioana Ucenic, ROMANIA
Zhijin Zhao, CHINA
Ina Taralova, FRANCE
Zhige Zhou, CHINA
Yuanguo Zhu, CHINA

Preface

This year the 8th WSEAS international conference on Microelectronics, Nanoelectronics, Optoelectronics (MINO '09) was held in Istanbul, Turkey. The Conference remains faithful to its original idea of providing a platform to discuss device characterization and modelling, device physics and novel structures, materials and characterization techniques, reliability and failure analysis, radiation effects, packaging, surface mount technology 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

Plenary Lecture 1: Nanotechnology & Nanomaterials in Architecture <i>Pelin Yildiz</i>	11
Proposed Nanotechnology Park in South Wales, Industrial and Organizational Challenges <i>Ahmet Karakas</i>	13
Timing Measurement Built-in Self Test (Bist) for System on Chip (SOC) <i>M.Amir Abas, G.Russell, D.J.Kinniment</i>	17
Synthesizable Time Measurement and Test Scheme for SOC Architecture <i>M. Amir Abas</i>	25
Toward Structure Preserving Model Reduction for Analysis and Simulation in Micro-Technology <i>Yousof Gheisari</i>	32
Accuracy and Efficiency Enhancement in Analysis and Simulation in Micro-Technology Using Frequency-Domain Hybrid Reduction Method: Micro-Electromechanical Optical Filter Case Study <i>Yousof Gheisari</i>	37
Analysis of a Dar Impatt Diode for High Frequency Part of Millimetric Region <i>Alexander Zemliak, Santiago Cabrera</i>	42
A Multi-Level Switching Amplifier with Improved Power Efficiency for Analog Signals with High Crest Factor <i>Jan Doutreloigne, Jodie Buyle, Vincent De Gezelle</i>	47
Reduction of Peak Input Currents During Charge Pump Boosting in Integrated High-Voltage Generators <i>Jan Doutreloigne</i>	53
Controlling and Tuning the Emission of Semiconductor Optical Amplifier for Sensor Application by Means of Fiber Bragg Gratings <i>Julian Sonksen, Mahmoud Ahmad, Nico Storch, Hubert Krause, Sven Blom, Alexander Potzl, Hartmut Hillmer</i>	59
Analog and Short Channel Effects Performance of Sub-100 Nm Graded Channel Fully Depleted Silicon on Insulator (SOI) <i>Norsyahida Jafar, Norhayati Soin</i>	63
The Analysis of the Scattering Over a Nonchiral-Chiral Interface in a Coaxial Waveguide <i>S. Mohammadi, S.S. Razavi Pour</i>	68
The Analysis of the Directional Couplers with Chiral Materials <i>S. S. Razavi Pour, S. Mohammadi, A. Kazerooni</i>	72
Interference Mitigation Using Successive Interference Cancellation in Optical CDMA Systems <i>Tawfig Eltaif, Hossam M. H. Shalaby, Sahbudin Shaari, Mohammad M. N. Hamarsheh</i>	77
Comprehensive Electro-Opto-Thermal Analysis of Gain-Cavity Offset on The Performance of Gain-Guided Vcsels <i>Kambiz Abedi, Vahid Ahmadi, Ehsan Sooudi, Mohammad Reza Moeini</i>	82

Design of a 100mhz 64-Point Fft Processor in 0.35μm Standard CMOS Technology <i>Hojat Mojarad, Hassan Hajghassem</i>	87
CMOS Voltage Reference Based on Threshold Voltage Summation <i>Wellington Avelino Do Amaral, Jose Antonio Siqueira Dias, Wilmar Bueno De Moraes</i>	94
Modeling an Optical Diaphragm for Human Pulse Pressure Detection <i>K. Hasikin, N. Soin, F. Ibrahim</i>	97
Design of High Performance Arithmetic Encoder for CABAC in H.264/AVC <i>Yoonsup Kim, Jeonhak Moon, Wonjoon Choi, Seongsoo Lee, Seok Lee, Dockha Woo</i>	103
SOC Platform Design of High Performance Arithmetic Encoder for Cabac in H.264/avc <i>Yoonsup Kim, Jeonhak Moon, Wonjoon Choi, Seongsoo Lee, Seok Lee, Dockha Woo</i>	107
Effective Electrical Conductivity Estimation for a Novel Multi-Phase Composite Material <i>Oltean Dan, Motoc Luca Dana, Luca Vasile</i>	111
Multi-Quantum Well Design Parameter Variation in InP-based VCSEL <i>K. Kumarajah, P. S. Menon, M. Ismail, B. Y. Yeop, S. Shaari</i>	115
Nonlinear Fiber Bragg Gratings <i>Farzin Emami, Amir H. Jafari</i>	118
A New Spice Method of Modeling of Optoelectronic Components for Optical Fiber Link Transmission <i>A. Sonne, A. Ouchar, A. Ghazel</i>	124
Authors Index	129

Plenary Lecture 1

Nanotechnology & Nanomaterials in Architecture



Associate Professor Pelin Yildiz

Hacettepe University

The Department of Interior Architecture and Environmental Design
Turkey

Email: peliny@hacettepe.edu.tr

Abstract: Architecture and building technology on the basis of nanobiobuilding structure and nanomaterials are going through some significant changes and developments. Nanotechnology is one of the most important symptom in between twenty-first century's key technologies while its economic impact is another subject to be recognized. New materials are being discovered and developed everyday as a result of investigating ways to achieve molecular and atomic precision in engineering of materials. These new materials present new opportunities to solve problems like heat absorbing windows, energy coatings etc.

Smart buildings concerning biodegradable features and nanobiobuilding facilities are current architectural aspects of space design. Designers should be capable of new innovations of architecture as nanomaterials during design process. The Nanohouse is a new type of ultra-energy efficient house exploiting the new materials being developed by nanotechnology. HydroHouse uses natural airflow and seawater to cool and humidify the greenhouse. Seawater is evaporated at the facades of the greenhouse; as air passes into the greenhouse it increases in humidity. But the smart part is in the structural columns, which also serve as supports for the growing racks. When it rains, fresh rainwater is allowed to trickle down from the roof, within the cylindrical columns.

In architecture and the construction industry it is capable of leading the building structure and architecture to an optimum level, for instance the coating of surfaces to lend them functional characteristics such as increased tensile strength, self-cleaning capacity, fire resistance, and many other capacities. The future of the nanotechnology field depends on our ability to assemble nanoparticles into 3D structures we can use to develop new technologies.

Nanomaterials are not only useful for some partial requirements like roofs and facades; they also expand some design possibilities for interior and exterior spaces. Nano-insulating materials open up new possibilities both for sustainable design strategies and architects.

Nanotechnology on the near horizon, may take building enclosure materials (coatings, panels and insulation) to a maximum capacity of performance in terms of energy, light, security and intelligence. Even these first steps into the world of nanotechnology could significantly improve the nature of building structure and efficiency and the way our buildings relate to environment. The development of carbon nanotubes and other breakthrough materials could affect building design and performance. Brief definitions of nanotechnology, nanobiobuildings, smart buildings, nanomaterials are the main approaches of this Plenary Speech identifying technology based design.

Brief Biography of the Speaker: Pelin Yildiz is an interior architect working as an Associate Professor in Hacettepe University. She's graduated from the Department of Interior Architecture and Environmental Design in Hacettepe University, Turkey. She's finished MA. & PhD. at the same department. The subject of PhD. is about the variable and flexible approaches of television studios. She's focusing on technology and space design in a wider aspect. She's attended several conferences by presentations and workshops; in many countries dealing with artificial intelligence, computational intelligence, multimedia, systematical integration of technology based design etc. and. She has nearly forty publications focusing on AI in architectural design. Some of her researches are concerning the subjects, artificial intelligence as a supplier of virtual reality in performance areas by application samples from Turkey; and also virtual film stages regarding computational intelligence as a communication medium. She has project works concerning with the affect of technology. The subject of this project work is; artificial intelligence in interior architecture and a comprehensive analysis of samples regarding spatial organization from Turkey. She also has publications and conference presentations with the international indexes like ISI, Thomson Scientific and EI etc. She's concentrating on studies concerning the relation of architectural design with technological developments. Smart buildings and nanotechnology on the basis of nanomaterials are her latest researches concerning energy conserving buildings.

Authors Index

Abas, M.	17		Kazerooni, A.	72	
Abas, M. A.	25		Kim, Y.	103,	107
Abedi, K.	82		Kinniment, D. J.	17	
Ahmad, M.	59		Krause, H.	59	
Ahmadi, V.	82		Kumarajah, K.	115	
Blom, S.	59		Lee, S.	103,	107
Buyle, J.	47		Menon, P. S.	115	
Cabrera, S.	42		Moeini, M. R.	82	
Choi, W.	103,	107	Mohammadi, S	68,	72
Dan, O.	111		Mojarad, H.	87	
Dana, M.	111		Moon, J.	103,	107
De Gezelle, V.	47		Ouchar, A.	124	
De Moraes, W. B.	94		Potzl, A.	59	
Dias, J. A.	94		Pour, S.	68,	72
Do Amaral, W.	94		Russell, G.	17	
Doutreloigne, J.	47,	53	Shaari, S.	77,	115
Eltaiif, T.	77		Shalaby, H.	77	
Emami, F.	118		Soin, N.	63,	97
Ghazel, A.	124		Sonksen, J.	59	
Gheisari, Y.	32,	37	Sonne, A.	124	
Hajghassem, H.	87		Sooudi, E.	82	
Hamarsheh, M. N.	77		Storch, N.	59	
Hasikin, K.	97		Vasile, L.	111	
Hillmer, H.	59		Woo, D.	103,	107
Ibrahim, F.	97		Yeop, B. Y.	115	
Ismail, M.	115		Zemliak, A.	42	
Jafar, N.	63				
Jafari, A.	118				
Karakas, A.	13				