

Editors:

Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA

Prof. Valeri Mladenov, Technical University of Sofia, BULGARIA

Prof. Azami Zaharim, Universiti Kebangsaan, MALAYSIA

Prof. Cornelia Aida Bulucea, University of Craiova, ROMANIA

Applied Electromagnetics, Wireless & Optical Communications

Proceedings of the 8th WSEAS International Conference on
Applied Electromagnetics, Wireless and Optical Communications
(ELECTRO '10)

Penang, Malaysia, March 23-25, 2010

Supported by
Universiti Kebangsaan
Malaysia



Recent Advances in Electrical Engineering
A Series of Reference Books and Textbooks

ISBN: 978-960-474-167-0
ISSN: 1790-2769

Published by WSEAS Press
www.wseas.org



Applied Electromagnetics, Wireless & Optical Communications





APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL COMMUNICATIONS

**Proceedings of the 8th WSEAS International Conference on
APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL
COMMUNICATIONS (ELECTRO '10)**

**Penang, Malaysia, March 23-25, 2010
Supported by Universiti Kebangsaan Malaysia**

Recent Advances in Electrical Engineering
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

ISSN: 1790-2769
ISBN: 978-960-474-167-0

APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL COMMUNICATIONS

**Proceedings of the 8th WSEAS International Conference on
APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL
COMMUNICATIONS (ELECTRO '10)**

**Penang, Malaysia, March 23-25, 2010
Supported by Universiti Kebangsaan Malaysia**

Recent Advances in Electrical Engineering
A Series of Reference Books and Textbooks

Published by WSEAS Press

www.wseas.org

Copyright © 2010, 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: 1790-2769

ISBN: 978-960-474-167-0



World Scientific and Engineering Academy and Society

APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL COMMUNICATIONS

**Proceedings of the 8th WSEAS International Conference on
APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL
COMMUNICATIONS (ELECTRO '10)**

**Penang, Malaysia, March 23-25, 2010
Supported by Universiti Kebangsaan Malaysia**

Editors:

Prof. Nikos Mastorakis, Technical University of Sofia, BULGARIA

Prof. Valeri Mladenov, Technical University of Sofia, BULGARIA

Prof. Azami Zaharim, Universiti Kebangsaan, MALAYSIA

Prof. Cornelia Aida Bulucea, University of Craiova, ROMANIA

International Program Committee Members:

John Tsitsiklis, USA

Irwin W. Sandberg, USA

Lotfi A. Zadeh, USA

Viola Vogel, SWITZERLAND

Dimitris Bertsekas, USA

Lena Valavani, USA

Leonid G. Kazovsky, USA

Leon O. Chua, USA

Brian A. Barsky, USA

K. R. Rao, USA

Bimal K. Bose, USA

Joseph Sifakis, FRANCE

Paul E. Dimotakis, USA

Sidney Burrus, USA

Biswa Nath Datta, USA

George Giannakis, USA

Nikolaos Bourbakis, USA

Nikos E. Mastorakis, BULGARIA

Yorgo Istefanopoulos, TURKEY

George E Andrews, USA

Stuart S. Antman, USA

Soren H. Morup, DENMARK

Robert A. Kosinski, POLAND

Ivan L'Heureux, CANADA

Alexander G. Ramm, USA

Steven Collicott, USA

Wilfried B. Kraetzig, GERMANY

Panos Pardalos, USA

Ronald Yager, USA

Stamatios Kartalopoulos, USA

Kleanthis Psarris, USA

Borje Forssell, NORWAY

Metin Demiralp, TURKEY

Constantin Udriste, ROMANIA

Amauri Caballero, USA

Geir Oien, NORWAY

George Vachtsevanos, USA

Spyros Tragoudas, USA

Olga Martin, ROMANIA

Demetrios Kazakos, USA

Gamal Elnagar, USA

Periklis Papadopoulos, USA

Preface

This year the 8th WSEAS International Conference on APPLIED ELECTROMAGNETICS, WIRELESS and OPTICAL COMMUNICATIONS (ELECTRO '10) was held in Penang, Malaysia, March 23-25, 2010. The conference remains faithful to its original idea of providing a platform to discuss applied electromagnetics, mathematical methods for problems of electromagnetic fields, mathematical physics, computational techniques, microwaves, antennas, radar, scattering, propagation, channel modeling, indoor propagation, satellite communications, network modeling, routing and switching technology, optical networking technologies, optical fibers, semiconductor optical amplifiers, active and passive optical components, signal processing for communications, channel estimation and cancellation, telecommunications standardization, satellite antennas, mobile communications, mobile satellite systems, microcellular communications, source compression, videoconferencing applications, teleinformatics, communication networks, multiuser detection and interference, array processing, traffic modeling and resource management, internet technologies, broadband communications, solid state electronics for communications 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

An Electro-Optic 3x3 Switch Based on Integrated Mach-Zehnder Interferometer	11
<i>Mohammad Syuhaimi Ab. Rahman, Khaled Mohamed Shaktur, Rahmah Mohammad</i>	
Secure Communication Using Chaos in Multiple Access Environment	15
<i>Raja Kumar R., Revathi M., Sampath A., Indumathi P.</i>	
Energy Analysis of RSA and ELGAMAL Algorithms for Wireless Sensor Networks	20
<i>Kayalvizhi R., Vijayalakshmi M., Vaidehi V.</i>	
Cellular Phone Antenna Design for PDA Operation	25
<i>Chien-Pang Chou, Guan-Yu Chen, Jwo-Shiun Sun, Y. D. Chen</i>	
Wideband WLAN Antenna Design for PDA Operation	29
<i>Chien-Pang Chou, Guan-Yu Chen, Jwo-Shiun Sun, Y. D. Chen</i>	
Confidentiality of VOIP Data Using Efficient ECDH Key Exchanging Mechanism	33
<i>T. Subashri, Kalluri Krishna Reddy, V. Vaidehi</i>	
Design of Material Attachment for SAR Reduction in Human Head	38
<i>Mohammad Rashed Iqbal Faruque, Mohammad Tariqul Islam, Norbahiah Misran</i>	
Magneto-Electric Diagnostic of Pressure Relaxations in Structure of Temperature-Influenced Yttrium Iron Garnets	42
<i>Vadim Koronovskyy</i>	
MAC and Routing Protocols for AD-HOC Cognitive Radio Networks	45
<i>Rajesh L., Hemalatha M. V.</i>	
A Laser Rangefinder for Air Traffic Management: Statistical Analysis of Acquired Test Session Data	49
<i>Mario Salerno, Giovanni Costantini, Massimo Carota, Daniele Casali, Massimiliano Todisco, Stefano Bocchetti</i>	
Analysis of Mach-Zehnder Interferometer with One Arm Loaded with Ring Resonator for Radio Over Fiber Applications	55
<i>Prabu K., Naga Krishnan R., Chockkalingam J., Nivethan V.</i>	
A Wireless Glove to Perform Music in Real Time	58
<i>Giovanni Costantini, Massimiliano Todisco, Giovanni Saggio</i>	
Throughput, Power and Cost Comparison of Zigbee-Based and ISM-Based WSN Implementations	61
<i>Rosula S. J. Reyes, Jose Claro Monje, Marc Ericson C. Santos, Lorlynn A. Mateo, Roma Lynne G. Espiritu, John Vianney Isiderio, Carlos Miguel M. Lacson, Ray Edwin T. Ocfemia</i>	
Performance Analysis of Spectrum Sensing for RF Receiver Structure in Cognitive Radio Networks	67
<i>Bub-Joo Kang, Jung-Won Seo, Sang-Woo Ban</i>	

Initial Synchronization of Spreading Sequences in DS/CDMA System <i>Muhammad Tahir Abbas Khan, Shahzadah Nayyar Jehan</i>	72
ENOD Sort on Diamond Architecture <i>Kamal Jadidy Aval, Masumeh Damrudi</i>	76
Pyramid Group Key Management on Mobile Ad Hoc Networks PGKM <i>Kamal Jadidy Aval, Masumeh Damrudi</i>	80
Authors Index	85

Authors Index

Aval, K. J.	76, 80	Mateo, L. A.	61
Ban, S.-W.	67	Mohammad, R.	11
Bocchetti, S.	49	Monje, J. C.	61
Carota, M.	49	Nivethan, V.	55
Casali, D.	49	Norbahiah Misran, N.	38
Chen, G.-Y.	25, 29	Ocfemia, R. E. T.	61
Chen, Y. D.	25, 29	Prabu, K.	55
Chockkalingam, J.	55	Rahman, M. S. A.	11
Chou, C.-P.	25, 29	Rajesh, L.	45
Costantini, G.	49, 58	Reddy, K. K.	33
Damrudi, M.	76, 80	Revathi, M.	15
Espiritu, R. L. G.	61	Reyes, R. S. J.	61
Faruque, M. R. I.	38	Saggio, G.	58
Hemalatha, M. V.	45	Salerno, M.	49
Indumathi, P.	15	Sampath, A.	15
Isiderio, J. V.	61	Santos, M. E. C.	61
Jehan, S. N.	72	Seo, J.-W.	67
Kang, B.-J.	67	Shaktur, K. M.	11
Kayalvizhi, R.	20	Subashri, T.	33
Khan, M. T. A.	72	Sun, J.-S.	25, 29
Koronovskyy, V.	42	Tariqul Islam, M. T.	38
Krishnan, R. N.	55	Todisco, M.	49, 58
Kumar, R. R.	15	Vaidehi, V.	20, 33
Lacson, C. M. M.	61	Vijayalakshmi, M.	20