RECENT ADVANCES in ELECTRONICS, HARDWARE, WIRELESS and OPTICAL COMMUNICATIONS

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Past President of the Intern. Geothermal Association, Oregon Institute of Technology, USA

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Cambridge, UK, February 21-23, 2009

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Preface

This year the 8th WSEAS International Conference on ELECTRONICS, HARDWARE, WIRELESS and OPTICAL COMMUNICATIONS (EHAC '09) was held in the University of Cambridge. The Conference remains faithful to its original idea of providing a platform to discuss theoretical and applicative aspects of electronics, nanostructures and nanotechnologies, silicon devices, optoelectronic devices, fuzzy logic and circuits design, high-data rate wireless channels, stratospheric station systems, wireless networks, broadband access networks, microwaves, antennas, radar 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.

During this last year we witnessed the growth of the European Union interest in Wireless Communications. This is an additional proof that it is seen not only as an exciting research area but also as technologies that may solve current European citizens' concerns with several practical problems.

For a discipline which is central to research and also to industry and which generates interests not only among academicians but also among large companies and government departments and agencies, it is important to look at the market and at its movements.

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: Analytical Synthesis Method - A New Circuit Design Method for the Challenge without Trade-off 9
Chun-Ming Chang

Improving ACK Reply of DSR Protocol for Mobile Ad Hoc Network 11
Qi Han, Abdullah Gani , Nor Badrul Anuar, Omar Zakaria

Different Wideband Direction of Arrival (DOA) Estimation methods: An Overview 17
Sandeep Santosh, O. P. Sahu, Monika Aggarwal

A Low Voltage Low Power CMOS based 4GHz VCO for RF Applications 26
Manisha Pattanaik, Deepak Singhal

Prediction in Electronics based on Limited Information 33
Jelena Milojkovic, Vanco Litovski

Utilizing Satellite Systems for Mobile Communications: An Emerging Approach 39
Basil M. Al-Kasasbeh, Rafa E. Al-Qutaish, Mohammad I. Muhairat

Genetic Approach Based Design of Dispersion-Free Optical Fiber 45
Maan M. Shaker, Mahmood Sh. Majeed, Raid W. Daoud

Location Privacy in Mobile IPv6 Distributed Authentication Protocol Using Mobile Home Agents 51
Andrew Georgiades, Yuan Luo, Aboubaker Lasebae, Richard Comley

A Development of Wireless Interoper-mobile Application for Outdoor Operation Management 57
Jiri F. Urbanek, Jaroslav Prucha

Novel Direct Digital Frequency Synthesis With Direct Analog Output Architecture Based On Artificial Neural Networks 65
Khosro Rajabpour Moghaddam

Machine Efficiency and Man Power Utilization on Production Lines 70
S. K. Subramaniam, S. H. Husin, Y. Yusop, A. H. Hamidon

The Impact of M-Commerce in Global Perspectives - A SWOT Analysis 76
J. Felicitta, J. Gnana Jayanthi

Development Program for Heat Balance Analysis Fuel to Steam Efficiency Boiler And Data Wireless Transfer 81
Nattapong Phanthuna ,Warunee Srisongkram, Sunya Pasuk,Thaweesak Trongtirakul

Tunable Linear Conductance by Two MOSFETs and its Application to Analogue-Mixed VLSI for Mobile Communications and Biologically Plausible Neuromorphic Hardware 86
Woojoon Han, Ilsong Han

Aero-Pilot Concentration Monitoring and Alert system using Correlation and ZIGBEE 94
S. Rajasekar, A. H. Syed Sulthan Alaudeen

Design and Implementation of a STANAG 5066 Data Rate Change Algorithm for High Data Rate Autobaud Waveforms 98
Stephan Schulze, Gerhard P. Hancke

24 GHz Active Phased Array Antenna for Microwave Sensors 108
S. I. Mitu Sheikh, S. M. Al-Shahrani, U. Johar

Analysis and Comparison of Optimized Multipump Distributed Raman Amplifiers in Different Fiber Medias 112
M. Katebi Jahromi, F. Emami

Forming Text in PDAs for Special Education Students 116
Umit Girgin, H. Ferhan Odabasi, M. Cem Girgin

Analysis of Low Noise and Gain Flattened Distributed Raman Amplifiers Using Different Fibers 119
Farzin Emami, Amir H. Jafari

Evaluation of mLearning in Special Education Context 124
Cem Cuhadar, H. Ferhan Odabasi, Abdullah Kuzu

Analytical Modelling: An Investigation into the Effect of Absorption Processes on the Performance of a Waveguide-based Biosensor 129
H. J. Kadim

Design and Implementation of Embedded Fuzzy Controllers Based on Fourier computation of Membership Functions 133
V. O. S. Olunloyo, A. M. Ajofoyinbo, O. Ibidapo-Obe

Higher Education Provision for the Hearing Impaired and Internet Based Education in Anadolu University- ANAPOD 143
M. Cem Girgin, Hakan Senel

Remote Water Quality Monitoring System using Wireless Sensors 148
Nazleeni Samiha Haron, Mohd Khuzaimi Mahamad, Izzatdin Abdul Aziz, Mazlina Mehat

Overvoltage Protective Device and Method of Overvoltage Protection 155
Hitoshi Kijima

Analysis of Routing Metrics for Providing Better Link Utilization in WiMAX Using Soft Computing 161
Arianit Maraj

Analysis of Call Scenario in NGN Network 167
Skender Rugova, Arianit Maraj

Implementing Lightweight Reservation Protocol for Mobile Network Using Crossover Router & Pointer Forwarding Scheme 173
Lina Yang, Abdullah Gani, Omar Zakaria, Nor Badrul Anuar

Secure Efficient Geocast Protocol for Sensor Networks with Malicious Nodes 179
Young-Chul Shim

Comparison of Rectangular and T-Shaped Microstrip Antenna 185
Mohamed Ismaeel, T. Jayanthy, S. Sathyamurthy

Authors Index 190

Plenary Lecture

Analytical Synthesis Method - A New Circuit Design Method for the Challenge without Trade-off

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Abstract: Analytical Synthesis Method (ASM) has been presented in several papers published in the IEEE Transactions on Circuits and Systems since 2003. It is one of the powerful design methods in the field of analog circuit design. It is the method using a succession of innovative algebra manipulation operations to decompose a complicated transfer function representing the relationship between the output and the input signals of a design project into many simple equations feasible by using the corresponding simple sub-circuitries. The simple sub-circuitries can be constructed by the desired configuration of the element such as the single-ended-input operational transconductance amplifiers (OTAs) and the grounded capacitors, both of which are used for absorbing and reducing the shunt parasitic capacitance and lead to have more precise output responses. In addition to this, the ASM can control the number of the terms in the complicated decomposition process such that the number of both active and passive components used in the circuit is the least compared to the previously reported ones. Then, the ASM is the only one method which can simultaneously achieve the three important criteria for the design of OTA-C circuits without trade-off.

Due to the flexibility of the ASM, the simple sub-circuitries used in the circuit design can be changed and chosen according to different necessities for the target of the circuit design. For example, if the reduction of the number of the active and passive components used in the circuit is more important than the type of the element configurations like single-ended-input/differential-input OTAs and grounded/floating capacitors due to the consideration about power consumption, chip area, noise, and total parasitics……, etc., the minimum component OTA-C circuit can also be investigated and developed successfully using the ASMs. The fully flexible characteristic and the real demonstration in the literature of the ASM may make it be one of the most prospective methods in the field of analog circuit design in the near future.

Brief Biography of the Speaker: Chun-Ming Chang received the B.S.E.E. and M.S.E.E. degrees from National Cheng Kung University, Tainan, Taiwan, R. O. C. in 1975 and 1977, respectively, and the Ph.D. degree from the University of Southampton, Southampton, U.K., in 2004.

In 1979, he joined the Department of Electrical Engineering, Taipei Institute of Technology, Taipei, Taiwan, R. O. C., as a Lecturer. After one year, he transferred to the Department of Electronic Engineering, Fu Jen Catholic University, Taipei Hsien, Taiwan, R.O.C. In 1982, he joined the Department of Electrical Engineering, Chung Yuan Christian University, Chung-Li, Taiwan, R.O.C., where he became an Associate Professor and a Full Professor in 1985 and 1991, respectively. He is currently a Professor of Electrical Engineering and leader of the Electronic Circuits Group in the Department of Electrical Engineering, Chung Yuan Christian University. He is also a departmental teacher promotion committee member and a college teacher promotion committee member. He was the chairman of the Department of Electrical Engineering of Chung Yuan Christian University from 1995 to 1999. His research interests are divided into two parts: network synthesis and analog circuit design before and after 1991, respectively. The improvement for the approach technique to factorize a paramount matrix used in network synthesis and proposed by Professor I. Cederbaum let him be promoted to a Full Professor in 1991. He has published over 70 SCI papers, in which the most famous is the invention of a new analytical synthesis method for the design of analog circuits which can, for the first time, simultaneously achieve three important criteria for the design of OTA-C filters without trade-offs. Using a succession of innovative algebra manipulation operations, a complicated nth-order transfer function can be decomposed into a set of simple equations feasible using the single-ended-input OTAs and grounded capacitors. Several IEEE Transaction papers on Circuits and Systems with analytical synthesis method have been published in the literature since 2003. He is in the process of writing his professional textbook: “Analog Circuit Design---Analytical Synthesis Method”.

Prof. Chang is a senior member of the IEEE Circuits and Systems Society.