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
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 Racuciuc, 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
Guannrong Chen, HONG KONG
Edgar Sanchez-Sinencio, USA
Jim C. Bezdek, USA
A. J. van der Schaft, the NETHERLANDS
Istvan Nagy, Hungary
Wasfy B. Mikhail, 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
Agaryaswami 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. Baggheroer, 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 Bigliieri, 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
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**  
*Nasir Mehmood, Jens Ogniewski, Vinodh Ravinath*  
13

**Microcontroller based Closed-Loop Automatic Speed Control of DC Motor using PWM**  
*I. Moazzem, S. Rahman, M. A. Matin*  
18

**A Design of Parameter Optimal Iterative Learning Control for Linear Discrete-Time Systems**  
*Wataru Kase*  
22

**Wall Climbing Robot: Mechanical Design and Implementation**  
*A. Albagul, A. Asseni, O. Khalifa*  
28

**Graph Method for Solving Switched Capacitors Circuits**  
*Bohumil Brtnik*  
33

**Isolated Word Recognition based on Intelligent Segmentation by Using Hybrid HTD-HMM**  
*A. Reza Kazemi, B. Bahram Ehsandoust, C. Alborz Rezazadeh, D. Shahrkooh Ghaemmaghami*  
38

**Utilizing Intelligent Segmentation in Isolated Word Recognition Using a Hybrid HTD-HMM**  
*R. Kazemi, A. Rezazadeh Sereshkeh, B. Ehsandoust*  
42

**Performance Studies of Antenna Pattern Design using the Minimax Algorithm**  
*James Jen, Meng Qian, Zekeriya Aliyazicioglu, H. K. Hwang*  
50

**Digital Architecture for a Median Filter of Image Based on Sorting Network**  
*Victor Jim Enez-Fernandez, Carlos Ventura-Arizmendi, Denisse Martinez-Navarrete, Francisco Gonzal Lezmartinez*  
56

**Responses of Semiconductor Arrays due to Photon Absorption**  
*Aham Barzkar*  
60

**HHT-Based Time-Frequency Analysis Method for Biomedical Signal Applications**  
*Chin-Feng Lin, Jin-De Zhu*  
65

**Sensorless Speed Non Linear Control of Induction Motor**  
*Chouya Ahmed, Mansouri Abdellah, Chenafa Mohammed*  
69

**LabVIEW Visualization For Inductive Sensors Used In Shaping Control of A Segmented Reflector Test Bed**  
*Alok Desai, Jessica Alvarenga, Harshit Tarsaria, Khosrow Rad, Helen R. Boussalis*  
76

**Ray Tracing Visualization for Precision Pointing Architecture of A Segmented Reflector Testbed Using LabVIEW**  
*Alok Desai, Jessica Alvarenga, Harshit Tarsaria, Khosrow Rad, Helen R. Boussalis*  
81

**Generalized Methodology for Analog Network Optimization**  
*Alexander Zemliak, Ricardo Pena, Eduardo Rios*  
87
Analysis and Optimization of a DAR IMPATT Diode for 330 GHz
Alexander Zemliak, Andrey Ostrovsky, Sergio Vergara, Evgeniy Machusskiy

A Design Method for USBL Systems with Skew Three-Element Arrays
Mikhail Arkhipov

A Low Voltage and Low Power Electronically Tunable Resistor with Positive, Negative, Linear and Nonlinear I-V Characteristics
Roshanak Alavifard, Mohammad Pooyan

Influence of the Speech Quality in Telephony on the Automated Speaker Recognition
Robert Blatnik, Gorazd Kandus, Tomaz Sef

Digital Distance Relay Reliability Enhancement Using Real-Time Filter
Abderrahmane Ouadi, Hamid Bentarzi, Jean Claude Maun

Authors Index
## Authors Index

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

Recent Advances in Circuits, Systems, Signal and Telecommunications


127