

2010 International Symposium on Electronic System Design

(ISED 2010)

**Bhubaneswar, India
20 – 22 December 2010**



IEEE Catalog Number: CFP1075L-PRT
ISBN: 978-1-4244-8979-4

2010 International Symposium on Electronic System Design

ISED 2010

Table of Contents

Message from the General Chairs.....	x
Message from the Technical Program	
Chairs.....	xi
Organizing Committee.....	xii
Program Committee.....	xiv
Additional Reviewers.....	xvi

Keynotes Addresses

Moore's Law and Beyond: Electronic Design Challenges	1
<i>Jacob A. Abraham</i>	
Trends and Advances in Computing and Communication	2
<i>Praveen Vishakantaiah</i>	
Rapid Emergence and Convergence of Electronic Technologies as Multiplying Factor for Innovation Capability	3
<i>Karthikeyan Natarajan</i>	

Plenary Talks

Pin-Constrained Designs of Digital Microfluidic Biochips for High-Throughput Bioassays	4
<i>Sudip Roy, Debasis Mitra, Bhargab B. Bhattacharya, and Krishnendu Chakrabarty</i>	
Introducing Energy Efficiency into Graphics Processors	10
<i>B. V. N. Silpa and Preeti Ranjan Panda</i>	
Design and Validation of Robust Systems	11
<i>Subhasish Mitra</i>	
Skip the Analysis: Self-Optimising Networks-on-Chip (Invited Paper)	14
<i>Simon J. Hollis and Chris Jackson</i>	

A Practitioner's Approach to Software System Design	20
<i>Debajyoti Mukhopadhyay</i>	
History and Trends in Analog Circuit Challenges at the System Level	24
<i>Rand Gray</i>	
Using Test and Diagnosis to Enable Tomorrow's Robust Systems	25
<i>Shawn Blanton</i>	
Power Management in Multi-source Environment	26
<i>Amit Patra</i>	

Emerging Technology and System Design (ETD)

Timing Analysis in Carbon Nanotube Interconnects with Process, Temperature, and Voltage Variations	27
<i>Debaprasad Das and Hafizur Rahaman</i>	
CMOS LC Voltage-Controlled Oscillator Design Using Multiwalled Carbon Nanotube Wire Inductor	33
<i>A. Srivastava, Y. Xu, Y. Liu, A. K. Sharma, and C. Mayberry</i>	
Design of a Coffee Vending Machine Using Single Electron Devices: (An Example of Sequential Circuit Design)	38
<i>Biplab Roy and Biswarup Mukherjee</i>	
Retail Beamed Power for a Micro Renewable Energy Architecture: Survey	44
<i>Narayanan Komerath and Girish Chowdhary</i>	
Design of an Efficient Quantum Circuit Simulator	50
<i>Sourabh Maity, Arunima Pal, Tanaya Roy, Sudhindu Bikash Mandal, and Amlan Chakrabarti</i>	
Energy Efficient and Process Tolerant Full Adder Design in Near Threshold Region Using FinFET	56
<i>Aminul Islam, M. W. Akram, Ale Imran, and Mohd. Hasan</i>	

Power Aware System Design (PSD)

An Energy Efficient Secure Logic to Provide Resistance against Differential Power Analysis Attacks	61
<i>Pradeep Kumar Sana and M. Satyam</i>	
SPC: The Selective Prioritized Clustering Algorithm for MANETs	66
<i>T. Vijeesh, Niranjana Kumar Ray, and Ashok Kumar Turuk</i>	
A Taylor Expansion Diagram Approach for Nano-CMOS RTL Leakage Optimization	71
<i>S. Banerjee, J. Mathew, D. K. Pradhan, S. P. Mohanty, and M. Ciesielski</i>	
Power Reduction in Embedded System on FPGA Using on the Fly Partial Reconfiguration	77
<i>Sheetal U. Bhandari, Shaila Subbaraman, and Shashank Pujari</i>	

Energy Recovery Techniques for CNT-FET Circuits	81
<i>A. Srivastava, Y. Xu, and R. Soundararajan</i>	
Design of Arithmetic Circuits Using Reversible Logic Gates and Power Dissipation Calculation	85
<i>Madhusmita Mahapatro, Sisira Kanta Panda, Jagannath Satpathy, Meraj Saheel, M. Suresh, Ajit Kumar Panda, and M. K. Sukla</i>	

Digital System Design and Validation (DSD)

Effect of Border Traps on Electron Mobility of Nano-Scale MOS Devices	91
<i>S. S. Rathod, A. K. Saxena, and S. Dasgupta</i>	
Memory-Based Computation of Inner-Product for Digital Signal Processing Applications	95
<i>Pramod Kumar Meher</i>	
Multiple Bit Error Detection and Correction in GF Arithmetic Circuits	101
<i>J. Mathew, S. Banerjee, P. Mahesh, D. K. Pradhan, A. M. Jabir, and S. P. Mohanty</i>	
Design of Combinational Circuits by Cyclic Combinational Method for Low Power VLSI	107
<i>Biswarup Mukherjee and Anup Kumar Dandapat</i>	
Test of Embedded Content Addressable Memories	113
<i>P. Manikandan, Bjørn B. Larsen, Einar J. Aas, and Sudhakar M. Reddy</i>	
Optimization of Four Wave Mixing Effect in Radio-over-Fiber for a 32-Channel 40-GBPS DWDM System	119
<i>Bijayananda Patnaik and P. K. Sahu</i>	
A Variation Aware Circuit Design Using Dynamic Clock Stretching	125
<i>V. Mahalingam, N. Ranganathan, N. Ahmed, and T. Haider</i>	
Low-Cost Design of Serial-Parallel Multipliers Over GF(2 ^m) Using Hybrid Pass-Transistor Logic (PTL) and CMOS Logic	131
<i>Pramod Kumar Meher, Shen-Fu Hsiao, Chia-Sheng Wen, and Ming-Yu Tsai</i>	
A Novel Technology Mapping Technique for BDD-Based Circuits Using LEAP Cells	135
<i>Gopal Paul, Ajit Pal, and Bhargab B. Bhattacharya</i>	
SAT Based Multi Pin Net Detailed Routing for FPGA	141
<i>Shyamapada Mukherjee and Suchismita Roy</i>	

Embedded System Design (ESD)

Exploiting GPU On-chip Shared Memory for Accelerating Schedulability Analysis	147
<i>Swaroop Nunna, Unmesh D. Bordoloi, Samarjit Chakraborty, Petru Eles, and Zebo Peng</i>	
CePal: An InfraRed Based Remote Control for Cerebral Palsy Patients	153
<i>Prashant Garg, Hitesh Sabnani, Mohit Maheshwari, Ravi Bagree, and Prabhat Ranjan</i>	

Microcontroller Based Polyhouse Automation Controller	158
<i>G. K. Banerjee and Rahul Singhal</i>	
Design of a Reconfigurable Embedded Data Cache	163
<i>Ruchi Rastogi Bani, Saraju P. Mohanty, Elias Kougianos, and Garima Thakral</i>	
Design of Miniature Space Grade Navigation Camera for Lunar Mission	169
<i>K. Subhalakshmi, B. Basavaraj, P. Selvaraj, and Jayantal Laha</i>	

Analog/Mixed-Signal System Design (AMS)

Enhanced Ground Bounce Noise Reduction in a Low Leakage 90nm 1-Volt CMOS Full Adder Cell	175
<i>Manisha Pattanaik, Shantanu Agnihotri, M. V. D. L. Varaprashad, and T. Anand Arasu</i>	
A Novel Methodology for Design Automation of CMOS Operational Amplifiers	181
<i>Praveen K. Meduri and Shirshak K. Dhali</i>	
Harmonic Performance Evaluation of CMOS SOI SPDT Switch with Embedded Lateral Substrate Model	187
<i>Akshaykumar Salimath and M. Satyam</i>	
Nano-CMOS Mixed-Signal Circuit Metamodeling Techniques: A Comparative Study	191
<i>Oleg Garitcelov, Saraju P. Mohanty, Elias Kougianos, and Priyadarsan Patra</i>	

CAD for Embedded System Design (CAD)

Test Wrapper Design for 3D System-on-Chip Using Optimized Number of TSVs	197
<i>Surajit Kumar Roy, Sourav Ghosh, Hafizur Rahaman, and Chandan Giri</i>	
Differential Evolution Algorithm for MESFET Small Signal Model Parameter Extraction	203
<i>Samrat L. Sabat and Siba K. Udgata</i>	
Optimal Reversible Logic Circuit Synthesis Based on a Hybrid DFS-BFS Technique	208
<i>Dipak K. Kole, Hafizur Rahaman, Debesh K. Das, and Bhargab B. Bhattacharya</i>	

Software System and Application Design (SSD)

Impact of Web 2.0 and Cloud Computing Platform on Software Engineering	213
<i>Radha Guha and David Al-Dabass</i>	
Analysis of QOS Parameters for DSDV and DSR in Hybrid Scenario	219
<i>Koushik Majumder, Subir Kumar Sarkar, and Sudhabindu Ray</i>	
Authentication/Secret Message Transformation through Wavelet Transform Based Subband Image Coding (WTSIC)	225
<i>J. K. Mandal and Madhumita Sengupta</i>	

A Novel Modified Directional Weighted Median Based Filter for Removal of Random Impulse Noise (MDWMF)	230
<i>J. K. Mandal and Aparna Sarkar</i>	
Automated Software Testing Using Metaheuristic Technique Based on an Ant Colony Optimization	235
<i>Praveen Ranjan Srivastava and Km Baby</i>	
A GIS Based Tool for Change Detection of Large Scale Landuse Map	241
<i>Prasun Halder, J. K. Mandal, and Satadal Mal</i>	
A Novel Technique to Protect Piracy of Quality Songs through Amplitude Manipulation (PPAM)	246
<i>Uttam Kr. Mondal and J. K. Mandal</i>	
 Workshop for Engineering Scholars (WES)	
A Successful Faculty Member: Essential Components	251
<i>Durga Misra</i>	
Interconnect and Device Scaling Trends in CMOS VLSI	252
<i>Kartik Raol</i>	
Trustworthy Wireless Networks: Issues and Applications (Invited Paper)	253
<i>Kannan Govindan, Prasant Mohapatra, and Tarek F. Abdelzaher</i>	
Nyquist Meets Bode on the z-Plane	259
<i>L. H. Keel and S. P. Bhattacharyya</i>	
Digital Nano-CMOS VLSI Design Courses in Electrical and Computer Engineering through Open-Source/Free Tools	265
<i>Elias Kougianos, Saraju P. Mohanty, and Priyadarsan Patra</i>	
Research: Culture and Best Practices	271
<i>Prasant Mohapatra</i>	
 Author Index	 272