

2016 Sixth International Symposium on Embedded Computing and System Design (ISED 2016)

**Patna, India
15-17 December 2016**



**IEEE Catalog Number: CFP1675L-POD
ISBN: 978-1-5090-2542-8**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1675L-POD
ISBN (Print-On-Demand):	978-1-5090-2542-8
ISBN (Online):	978-1-5090-2541-1
ISSN:	2473-9421

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2016 Sixth International Symposium on Embedded Computing and System Design **ISED 2016** **Table of Contents**

Proceedings of the 2016 Sixth International Symposium on Embedded Computing and System Design

An Improved Gate Library for Logic Synthesis of Optical Circuits.....1 <i>Shuchishman Burman, Kamalika Datta, Robert Wille, Indranil Sengupta and Rolf Drechsler</i>	1
Generating and Checking Control Logic in the HDL-based Design of Reversible Circuits.....7 <i>Robert Wille, Oliver Keszocze, Lars Othmer, Michael Kirkedal Thomsen and Rolf Drechsler</i>	7
Exploring Superior Structural Materials Using Multi-Objective Optimization and Formal Techniques.....13 <i>Rolf Drechsler, Stephan E., Nils Ellendt, Sebastian Huhn, Lutz Mädle</i>	13
Towards a Model-Based Verification Methodology for Complex Swarm Systems.....18 <i>Jonas Gomes, Filho1 Nils Przigoda1, Robert Wille, Rolf Drechsler,</i>	18
A Low Cost Wireless Sensor Network for Precision Agriculture.....24 <i>George Eldho John</i>	24
Targeting System-Level and Kernel-Level Optimizations of Computer Vision Applications on Embedded Systems.....28 <i>Djamila Dekkiche, Bastien Vincke and Alain Merigot,</i>	28
Extraction of Two wire and Power Line Loop Topology Using Customized Genetic Algorithms.....33 <i>Arjun Ravishankar and Ravishankar S</i>	33
Ab-initio study on FinFETs and their application in IoT aided Robotics.....38 <i>Sreeja Rajendran, Mary Lourde .R.</i>	38
A Survey of Video Datasets for Anomaly Detection in Automated Surveillance.....43 <i>N Patil, Prabir Kumar Biswas</i>	43
Real-Time Resource Allocation on a Dynamic 2-level Symbiotic Fog Architecture.....49 <i>Vrinda Kochar, Arnab Sarkar</i>	49
Adaptive Fractional Differential Approach to Enhance Underwater Images.....56 <i>Snehan Shourya, Sumit Kumar, Rajib Kumar Jha</i>	56

Automation of FPGA Based Pin Muxing for Automotive SOC Validation.....	61
<i>Deepa Chandran, Jayakrishna Guddeti, Shivaprasad Sadashivaiah</i>	
Vulnerability Detection and Error Minimization in Bioassay Sample Mixing and Droplet Routing for Digital Microfluidic Biochips.....	66
<i>Ankita Singh, Tuhina Samanta</i>	
Analysis of Implant Parameters in High Voltage TRIPLE RESURF LDMOS for Advanced SoC Applications.....	72
<i>Jhnanesh Somayaji, M.S.Bhat</i>	
High-Speed Decoder Design using Memristor-Based Nano-Crossbar Architecture.....	77
<i>Malay Kule, Avik Dutta, Hafizur Rahaman, Bhargab B. Bhattacharya</i>	
Generalized Construction of Quantum Multiplexers and De-Multiplexers using A Proposed Novel Algorithm based on Universal Fredkin Gate.....	82
<i>Dipak Kumar Kole, Jhuma Dutta, Arpita Kundu, Suravi Chatterjee, Suravi Agarwal and Tanushri Kisku</i>	
A Multi-mode MASH Sigma Delta Modulator for Low Power Wideband Applications.....	87
<i>Rijo Sebastian, Jos Prakash A.V., Babita Roslind Jose, Shahana T.K.</i>	
Satisfiability Modulo Theory based formulation for Floorplanning in VLSI circuits.....	91
<i>Suchandra Banerjee, Anand Ratna and Suchismita Roy</i>	
A Testing Scheme for Mixed-Control Based Reversible Circuits.....	96
<i>Bappaditya Mondal, Chandan Bandyopadhyay and Hafizur Rahaman</i>	
Design of low power 5-input Majority Voter in Quantum-dot Cellular Automata with effective Error Resilience.....	101
<i>Mrinal Goswami, Bibhash Sen and Biplab K. Sikdar</i>	
VLSI Thermal Placement Issues: A Cooperative Game Theory Based Approach.....	106
<i>Arindam Sinha Roy, Pranab Roy, Hafizur Rahaman</i>	
32 Bit Re-configurable RISC Processor Design and Implementation for BETA ISA with inbuilt Matrix Multiplier.....	112
<i>Raj Prakash Singh, Ankit K Vashishtha, Krishna R</i>	
Design of CA Based Scheme for Evenhanded Data Migration in CMPs.....	117
<i>Baisakhi Das, Supreeti Kamilya and Biplab K Sikdar</i>	
Secure Fingerprint Fuzzy Vault using Hadamard Transformation to defy Correlation Attack	122
<i>Manvjeet Kaur and Sanjeev Sofat</i>	
Thermo-Magnetic Shape Control of Nano-Ferromagnetic particle doped Shape Memory Alloy for Orthopedic devices and Rehabilitation Techniques.....	127
<i>Arvind Gautam, Mounika Kare, Divya Andem, Pallavi Karhade, A. Bhargavi Rani and Amit Acharyya, Swati Ghosh Acharyya</i>	
K-Nearest Neighbor Based Methodology for Accurate Diagnosis of Diabetes Mellitus.....	132
<i>Madhuri Panwar, Amit Acharyya, Rishad A. Shafik and Dwaipayan Biswas</i>	
Efficient Estimation and Compensation of Doppler shift for OFDM Signals in Underwater Communications.....	137
<i>K.Saraswathi and S.Ravishankar</i>	

Density Aware Position Based Routing (DAPBR) Protocol for VANET.....	142
<i>Anant Ram and Manas Kumar Mishra</i>	
Cost Effective ModLeach-A* Search Algorithm for Shortest Path Routing in Wireless Sensor Networks.....	147
<i>Arabinda Nanda and Amiya Kumar Rath</i>	
Automotive Microcontroller Interface Protocol Validation in Post Silicon using on the fly error injector.....	152
<i>Deepa Chandran, Jayakrishna Guddeti and Shivaprasad Sadashivaiah</i>	
FPGA based Validation technique for Advanced Driver Assistance System.....	159
<i>Pooja Yadav and Jayakrishna Guddeti</i>	
Power Quality Analysis Using Modified S-Transform on ARM Processor.....	166
<i>Sandeep Raj, T.C. Krishna Phani and Jyotirmayee Dalei</i>	
Zero-Day Malware Detection.....	171
<i>Ekta Gandotra, Divya Bansal and Sanjeev Sofat</i>	
Cellular Automata Based Fault Tolerant Resistive Memory Design.....	176
<i>Mousumi Saha, Sutapa Sarkar Chatterjee and Biplab K Sikdar</i>	
Design of Low Cost Latches Based on Reversible Quantum Dot Cellular Automata.....	181
<i>Debajyoty Banik</i>	
A New ALU Architecture Design using Reversible Logic.....	187
<i>Arindam Banerjee and Debesh Das</i>	
Rule Based Hardware Approach for Machine Transliteration: A First Thought.....	192
<i>Debajyoty Banik, Prof. Pushpak Bhattacharyya and Dr. Asif Ekbal</i>	
Automotive Microcontroller Interface Protocol Validation in Post Silicon using PWM Based Protocol emulator.....	196
<i>Deepa Chandran, Jayakrishna Guddeti and Shivaprasad Sadashivaiah</i>	
Secure Opportunistic Large Array for Internet of Things.....	201
<i>Paul Ansel V., M A Aboothahir, Smritilakshmi and Babita Roslind Jose</i>	
Early power-grid seed creation to reduce power-signoff effort.....	205
<i>Anshuman Anand and Nageswara Rao Gadireddy</i>	
An Efficient Method for Character Analysis Using Space In Handwriting Image.....	210
<i>Subham Nagar, Sudiksha Chakraborty, Arka Sengupta, Joymallya Maji and Rajib Saha</i>	
Global Abnormal Events Detection in Surveillance video: A Hierarchical approach.....	217
<i>N. Patil and Prabir Kumar Biswas</i>	
Interfacing a Computer Aided Design Tool with a Multi-Function Numerical Machine.....	223
<i>Akhil P., Abhijith C. R. and Bijoy A. Jose</i>	
A Model-Based Development Environment for Rapid-Prototyping of Latency-Sensitive Control Software.....	228
<i>Sakthivel Manikandan Sundharam, Lionel Havet, Sebastian Altmeyer and Nicolas Navet</i>	

An Open Source Low-Cost Alligator-Inspired Robotic Research Platform.....	234
<i>Kishan Gopal Karwa, Samiran Mondal, Amarjeet Kumar and Atul Thakur</i>	
Reduced Order Extended Kalman Filter for State Estimation of Brushless DC Motor.....	239
<i>Surya Susan Alex, Asha Elizabeth Daniel and Jayanand B</i>	
Studies on Route Sustenance and Outage Probability in Cognitive Mobile Secondary User Networks.....	245
<i>M.K. Kaushik and Y. Yoganandam</i>	
MASI: An Eviction Aware Cache Coherence Protocol for CMPs.....	249
<i>Mamata Dalui, Tannishtha Som, Shivani Bansal, Shivam Pant and Biplab K Sikdar</i>	
CA Based Protocol Processor for Heterogeneous CMPs.....	254
<i>Bidesh Chakraborty, Mamata Dalui and Biplab K Sikdar</i>	
Computer Aided Screening of Retinopathy of Prematurity- A Multiscale Gabor Filter Approach.....	259
<i>Sivakumar R, Manu Eldho, Jiji CV and Anand Vinekar</i>	
Identification of Scope of Valence Shifters for Sentiment Analysis of Product Reviews.....	265
<i>Nilesh Shelke, Shrinivas Deshpande and Vilas Thakre</i>	
Design and Analysis of a Series-Parallel Coaxial Stub Type Balun Fed Dipole Antenna.....	270
<i>Chithra Liz Palson, Manju Lakshmy E. K., Ajeena Elza Sunny and Deepti Das Krishna</i>	
Ballistic target tracking and its interception using suboptimal filters on reentry.....	274
<i>Rahul Radhakrishnan, Manika Saha, Shovan Bhaumik and Nutan Kumar Tomar</i>	
A Low Cost Sensor Based Autonomous and Semi-Autonomous Fire-Fighting Squad Robot.....	279
<i>Satya Veera Pavan Kumar, Maddukuri, Uday Kishan Renduchintala, Aravinthan Visvakumar, Chengzong Pang and Sravan Kumar Mittapall</i>	
A Methodology for Designing LVDS Interface System.....	284
<i>Jayshree, Seema Verma and Amitabh Chatterjee</i>	
Parameter Sensing and Object Tracking using Global Positioning System.....	289
<i>Arghya P. Saikia Thengal, Naman Rastogi, Abhilash Medhi, Rituranjan Srivastava and Kamalika Datta</i>	
Enhancing FPGA Softcore Processors for Digital Signal Processing Applications.....	294
<i>Ammar A. Altameemi and Neil W. Bergmann</i>	
Compressed Sense Sigma Delta Modulators for Bio-Medical Image Acquisition.....	299
<i>Sabarinath G and Babita Jose</i>	
Pose Estimation in Real Time Video using Tri-Line Method.....	303
<i>A. Vanitha and V. Vaidehi</i>	
Design Methodology for an Energy Neutral Health Monitoring Wireless Sensor Node.....	308
<i>Ankur Pakhara and Biswajit Mishra</i>	
Write Schemes Analysis for Memristor Crossbar Memory Arrays.....	313
<i>Adedotun Adeyemo, Xiaohan Yang, Anu Bala and Abusaleh Jabir</i>	

High Level Abstraction of Memristor Model for Neural Network Simulation.....	318
<i>Anu Bala, Adedotun Adeyemo, Xiaohan Yang and Abusaleh Jabir</i>	
Robust Image Water marking using Combined DSR-SVM with PCA based feature reduction.....	323
<i>Vivek S Verma and Rajib Kumar Jha.</i>	
Spectrum Occupancy Measurement and Analysis in Kochi-India from a Cognitive Radio Perspective.....	328
<i>Jaison Jacob and Babita R Jose</i>	
Offline Signature Authentication: A Back propagation-Neural Network Approach.....	334
<i>Debajyoty Banik, Riya Roy Chowdhury and Akhilesh Panigrahi</i>	
EDA cost optimization through Design Process Analytics.....	340
<i>Ahsan Jafri, Paul Jebasingh E, Shantagoudar Goudar</i>	
Connected Motorized Riders - A Smart Mobility System to Connect Two and Three-wheelers.....	345
<i>Sakthivel Manikandan Sundharam, Loic Fejoz, and Nicolas Navet</i>	
Author Index.....	349