

# **2023 21st IEEE Interregional NEWCAS Conference (NEWCAS 2023)**

**Edinburgh, United Kingdom  
26-28 June 2023**



**IEEE Catalog Number: CFP23NEW-POD  
ISBN: 979-8-3503-0025-3**

**Copyright © 2023 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:	CFP23NEW-POD
ISBN (Print-On-Demand):	979-8-3503-0025-3
ISBN (Online):	979-8-3503-0024-6
ISSN:	2472-467X

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## TABLE OF CONTENTS

A Novel Dynamic Memristor Window Function for High Frequency Applications .....	1
<i>Y. R. Ananda, Subhashis Das, Gaurav Trivedi</i>	
Analog Baseband Circuits for Low-Power 802-11ba Wake-Up Radio in 40-Nm CMOS.....	6
<i>Andrea Boni, Michele Caselli, Francesco Frattini, Francesco Malena, Marco Ronchi</i>	
New Design of an Ultra Low Power CDR Architecture Using FDSOI 28 nm Technology .....	11
<i>Yuqing Mao, Yoann Charlon, Yves Leduc, Gilles Jacquemod</i>	
Wave Digital Emulation of a Light-Modulated Central Pattern Generator .....	16
<i>Sebastian Jenderny, Karlheinz Ochs, Oways Alsoloh</i>	
High-Speed all-GaN Gate Driver with Reduced Power Consumption.....	20
<i>Katia Samperi, Salvatore Pennisi, Francesco Pulvirenti</i>	
A Reservoir Computer-Based Modeling of Hunting Dynamics in Predator-Prey Scenarios.....	25
<i>Sebastian Jenderny, Karlheinz Ochs, Kamel Naoum Naame</i>	
A Simplified Hindmarsh-Rose Model Based on Power-Flow Analysis .....	30
<i>Sebastian Jenderny, Karlheinz Ochs, Matthew Gibson, Philipp Hövel</i>	
Bitwise ELD Compensation Under Integrator Nonidealities in $\Delta\Sigma$ Modulators .....	35
<i>Michael Pietzko, Julian Spiess, Jonathan Ungethüm, John G. Kauffman, Qiang Li, Maurits Ortmanns</i>	
Inductive Relaxation Oscillator with Current-Limiting.....	40
<i>Hervé Barthélemy, Florent Barthélemy, Rémy Vauché, Sylvain Bourdel</i>	
NB-IoT Wideband Power Amplifier and Diode-Based Antenna Switch co-Integration in 130 nm CMOS SOI .....	44
<i>Tristan Lecocq, Olivier Mazouffre, Eric Kerhervé, Jean-Marie Pham</i>	
A 10Bit 6 GS/s Time-Interleaved SAR ADC with a Single Full-Rate Front-End Track-And-Hold.....	49
<i>Sebastian Linnhoff, Frowin Buballa, Julius Edler, Enne Wittenhagen, Urs Hecht, Friedel Gerfers</i>	
On the Synthesis of Lossy Analog Filter Networks with Lossless-Like Passband Shape .....	54
<i>Roberto Gómez-García, José-María Muñoz-Ferreras, Li Yang, Xi Zhu</i>	
Assessment of Communication Protocols' Latency in Co-Processing Robotic Systems .....	59
<i>Eduardo Pereira, Lucas Luza, Nicolas Moura, Luciano Ost, Ney Calazans, Fernando Moraes, Rafael Garibotti</i>	
Accelerating Relational Database Analytical Processing with Bulk-Bitwise Processing-In-Memory .....	64
<i>Ben Perach, Ronny Ronen, Shahar Kvatinisky</i>	
A CDAC Mismatch Calibration Technique for SAR-Assisted Pipeline ADCs .....	69
<i>Zheyi Li, Laurent Berti, Geert Thys, Paul Leroux</i>	
An Energy-Efficient Design Strategy for Dickson Charge Pumps with Linear Distributed Capacitance .....	74
<i>Andrea Ballo, Alfio Dario Grasso, Gaetano Palumbo</i>	

Pixelated RF: Random Metasurface Based Electromagnetic Filters .....	79
<i>Jungmin Lee, Wei Jia, Berardi Sensale-Rodriguez, Jeffrey S. Walling</i>	
Correcting ADC Jitter Using DPLL Timing Error Signal.....	84
<i>Haoyang Shen, Hao Zheng, Daniel O'Hare, Deepu John, Barry Cardiff</i>	
Verification of In-Memory Logic Design Using ReRAM Crossbars .....	89
<i>Kamalika Datta, Arighna Deb, Fatemeh Shirinzadeh, Abhoy Kole, Saeideh Shirinzadeh, Rolf Drechsler</i>	
Sensitivity Analysis of Memory Bandwidth on Column-Superposed Versatile Linear CGRA .....	94
<i>Tomoya Akabe, Ryotaro Funai, Yasuhiko Nakashima</i>	
Exploring Security Threats by Hardware-Faults in Approximate Arithmetic Computing.....	99
<i>Morgana M. A. Da Rosa, Eduardo A. C. Da Costa, Rafael I. Soares, Sergio Bampi</i>	
Design and Implementation of an FFT-Based Neural Network Accelerator Using Rapid Single-Flux-Quantum Technology.....	104
<i>Olivia Chen, Yanzhi Wang, Fei Ke, Nobuyuki Yoshikawa</i>	
A Low Noise High Speed Dynamic Comparator Insensitive to PVT and Common-Mode Input .....	109
<i>Yaning Wang, Yihang Cheng, Yongli Chen, Fule Li, Chun Zhang, Zhihua Wang</i>	
A Time-Domain Charge-Balancing Method for Neuromodulators .....	114
<i>Stefan Reich, Markus Sporer, Maurits Ortmanns</i>	
A 16-Channel Real-Time Adaptive Neural Signal Compression Engine in 22nm FDSOI.....	119
<i>Liyuan Guo, Seyed Mohammad Ali Zeinolabedin, Franz Marcus Schüffny, Annika Weiße, Stefan Scholze, Richard George, Johannes Partzsch, Christian Mayr</i>	
Automated Information Flow Analysis for Integrated Computing-In-Memory Modules .....	124
<i>Lennart M. Reimann, Felix Staudigl, Rainer Leupers</i>	
A Flexible Power Management System-On-Chip for Implantable Brain-Machine-Interfaces.....	129
<i>Stefan Reich, Markus Sporer, Maurits Ortmanns</i>	
A 2 GHz Bandwidth, 6-Bit Inverter-Based Open-Loop Amplifier for High-Speed ADCs.....	134
<i>Pål Gunnar Hogganvik, Dag T. Wisland</i>	
Bent-Pyramid: Towards a Quasi-Stochastic Data Representation for AI Hardware.....	139
<i>Shady Agwa, Themis Prodromakis</i>	
Design and Experimental Evaluation of 60 GHz Self-Compensating Bond-Wire Interconnect .....	144
<i>Rabia Fatima Riaz, Florian Protze, Christian Hoyer, Jens Wagner, Frank Ellinger</i>	
Design and Modeling of Heterogeneous Semi-Active Wake-Up Radio for Sensor Network Applications.....	149
<i>Ruochen Ding, William Tatinian</i>	
Substrate Noise Mitigation Using High Resistivity Base Silicon Wafer for a 14 GHz VCO on 28 nm FD-SOI.....	153
<i>Youssef Bendou, Martin Rack, Dimitri Lederer, Andreia Cathelin, Jean-Pierre Raskin</i>	
Pose Aware RGBD-Based Face Recognition System with Hierarchical Bilinear Pooling.....	158
<i>Shu-Yun Wu, Ching-Te Chiu, Yung-Ching Hsu</i>	

Low Temperature and Dry Fingerprint Restoration with Ridge Loss and Orientation.....	163
<i>Hsueh-Kai Kuo, Ching-Te Chiu, Lien-Chieh Huang</i>	
Frequency and Noise Characterization for Baseband Signal Processing on Neuromorphic Circuits.....	168
<i>Melvin Galicia, Leon Happek, Magnus Balzer, Rainer Leupers</i>	
1st-Order Error-Feedback Sampling-Rate Reconfigurable Noise-Shaping SAR ADC for Multi-Channel CMOS Front-End ASICs for Space Applications.....	173
<i>Rashid Karim, Marco Grassi, Piero Malcovati</i>	
Multi-Context-Scrubbing Operation for a 1-Bit Counter Circuit .....	178
<i>Kakeru Ando, Minoru Watanabe, Nobuya Watanabe</i>	
TinyFL: On-Device Training, Communication and Aggregation on a Microcontroller for Federated Learning .....	182
<i>Lars Wulfert, Christian Wiede, Anton Grabmaier</i>	
Comparative Study of Linearized Analysis Frameworks for Mid-Rise TDCs .....	187
<i>Xu Wang, Michael Peter Kennedy</i>	
Flexible Analog-To-Feature Converter for Wireless Smart Healthcare Sensors.....	192
<i>Mikhail Manokhin, Paul Chollet, Patricia Desgreys</i>	
Heterogeneity in Time Delays Between Mutually Synchronized 24 GHz Oscillators .....	197
<i>Christian Hoyer, Lucas Wetzel, Dimitris Prousalis, Jens Wagner, Frank Jülicher, Frank Ellinger</i>	
A Beam Steerable Speaker Tracking-Based First-Order Differential Microphone Array.....	202
<i>Ali Sarafnia, M. Omair Ahmad, M. N. S. Swamy</i>	
A Zoom Architecture Using Linear-Exponential Incremental ADC.....	207
<i>Qingxun Wang, Kaiquan Chen, Liang Qi</i>	
A V-Band Compact LNA with $G_m$ -Boosting and Noise-Cancelling Technique .....	212
<i>Jingze Wang, Shulan Chen, Lei Zhang, Yan Wang</i>	
Optoelectronic Memristor Model for Optical Synaptic Circuit of Spiking Neural Networks .....	217
<i>Jiawei Xu, Yi Zheng, Chenxu Sheng, Yichen Cai, Dimitrios Stathis, Ruisi Shen, Li-Rong Zheng, Zhuo Zou, Laigui Hu, Ahmed Hemani</i>	
Integrated Beamforming and Resource Allocation in RIS-Assisted mmWave Networks Based on Deep Reinforcement Learning.....	222
<i>Di Chen, Hui Gao, Na Chen, Ruohan Cao</i>	
A Novel Push-Pull Input Buffer for Wideband ADCs with Improved High-Frequency Linearity .....	227
<i>Lorenzo Scaletti, Luca Bertulesi, Andrea Cristofoli, Andrea Bonfanti</i>	
Towards a CMOS-Process-Portable ReRAM PDK.....	232
<i>Andrea Mifsud, Timothy G. Constandinou</i>	
A 8.34 nW Wake-Up Receiver Achieving -50dBm Sensitivity at 2.4GHz.....	237
<i>S. Guigue, C. Leroux, J. B. Begueret, T. Taris</i>	
A 3.3V Saturation-Aware Neurostimulator with Reset Functionality in 22 nm FDSOI.....	241
<i>Franz Marcus Schüffny, Stefan Hänzsche, Stephan Henker, Seyed Mohammad Ali Zeinolabedin, Stefan Scholze, Sebastian Höppner, Richard Miru George, Christian Mayr</i>	

Gated Ring Oscillator Time Amplifier with Applications in Time Integration.....	246
<i>Fei Yuan</i>	
A Wide Input Common-Mode Range Pipelined ADC Front-End with Common-Mode Refreshing.....	251
<i>Junjie Jing, Yang Ding, Lingxiao Shen, Peng Wang, Fule Li</i>	
A Deep Reinforcement Learning-Based Routing Algorithm for Unknown Erroneous Cells in DMFBs .....	256
<i>Tomohisa Kawakami, Chiharu Shiro, Hiroki Nishikawa, Xiangbo Kong, Hiroyuki Tomiyama, Shigeru Yamashita</i>	
Error Analysis for Fused Floating-Point Square-Root and Division Based on Goldschmidt Algorithm .....	261
<i>Liangtao Dai, Binzhe Yuan, Yuan Wang, Chao Yang, Xin Lou</i>	
Training Low-Latency Spiking Neural Network with Orthogonal Spiking Neurons .....	266
<i>Yunpeng Yao, Man Wu, Renyuan Zhang</i>	
A 2.45GHz SiGe Power Amplifier with a Novel Digital Predistortion Using Orthogonal Sequences .....	271
<i>Antoine Lhomel, Maxandre Fellmann, Rémi Queheille, Yann Deval, Eric Kerhervé, François Rivet, Nathalie Deltimple</i>	
One-Transistor-Multiple-RRAM Cells for Energy-Efficient In-Memory Computing.....	276
<i>Max Uhlmann, Emilio Pérez-Bosch Quesada, Markus Fritscher, Eduardo Pérez, Markus Andreas Schubert, Marc Reichenbach, Philip Ostrovskyy, Christian Wenger, Gerhard Kahmen</i>	
Evaluation of Secure Circuit Styles Using Unipolar Logic Gates .....	281
<i>Jelle Biesmans, Kris Myny, Nele Mentens</i>	
An Ultra-Compact Calculation Unit with Temporal-Spatial Re-Configurability .....	286
<i>Guangxian Zhu, Yirong Kan, Renyuan Zhang, Yasuhiko Nakashima</i>	
An Inaccuracy Thermal Sensor with a New Digital Calibration Algorithm in 12nm CMOS.....	291
<i>Jun-Wan Wu, Yu-Sin Chang, Ding-Hao Wang, Po-Hung Chen</i>	
Improving Pin Accessibility of Standard Cells Under Power/Ground Stripes .....	295
<i>Pei-Sheng Lu, Rung-Bin Lin</i>	
Gate Camouflaging Using Reconfigurable ISFET-Based Threshold Voltage Defined Logic .....	300
<i>Elmira Moussavi, Animesh Singh, Dominik Sisejkovic, Aravind Padma Kumar, Daniyar Kizatov, Sven Ingebrandt, Rainer Leupers, Vivek Pachauri, Farhad Merchant</i>	
A Sub-Picosecond Resolution Jitter Instrument for GHz Frequencies Based on a Sub-Sampling TDA.....	305
<i>Ankush Mangain, Manasa Madhvaraj, Salvador Mir, Manuel J. Barragan, Jai Narayan Tripathi</i>	
A Memristor-Based Tuneable Offset Comparator .....	310
<i>Sachin Maheshwari, Jiaqi Wang, Alexander Serb, Themistoklis Prodromakis</i>	
An Integrated Analog Lock-In Amplifier Using a Passive 3-Path Band-Pass Filter for a Fluxgate Sensor Readout Circuit.....	315
<i>Maximilian Scherzer, Mario Auer, Werner Magnes</i>	
Retina Stimulator with Channel Dependent Arbitrary Waveforms in 28nm CMOS Process .....	319
<i>Raphel Steinhoff, Steffen Moll, Sebastian Kaltenstadler, Albrecht Rothermel</i>	

Memristive Crossbar for Hyper Dimensional Consumer Text Analytics Accelerator .....	324
<i>Pv Mohammad Navaz, R Chithra, Alex James</i>	
Background Calibration of Time-Interleaved ADCs with Polyphase Filters.....	329
<i>Hamidreza Mafi, Mohamed Ali, Yvon Savaria, Mohammad Honarparvar, Naim Ben-Hamida</i>	
Single Transistor Analog Building Blocks: Exploiting Back-Bias Reconfigurable Devices.....	334
<i>Niladri Bhattacharjee, Maximilian Reuter, Klaus Hofmann, Thomas Mikolajick, Jens Trommer</i>	
Design of a Current Sense Amplifier with Dynamic Reference for Reliable Resistive Memory .....	339
<i>Byung-Kwon An, Xueyong Zhang, Anh Tuan Do, Tony Tae-Hyoung Kim</i>	
Low-Power Event-Driven Spectrogram Extractor for Multiple Keyword Spotting: A Proof of Concept.....	344
<i>Soufiane Mourrane, Benoit Larras, Sylvain Clerc, Andreia Cathelin, Antoine Frappé</i>	
Finite State Automata Design Using 1T1R ReRAM Crossbar.....	349
<i>Simranjeet Singh, Omar Ghazal, Chandan Kumar Jha, Vikas Rana, Rolf Drechsler, Rishad Shafik, Alex Yakovlev, Sachin Patkar, Farhad Merchant</i>	
High-Resolution Fractional Digital Frequency Divider Using a Binary-Rate Multiplier.....	354
<i>Denis Flores, Dominique Dallet, Andrei Vladimirescu, Andreia Cathelin, Yann Deval</i>	
Extending Wireless Power Transfer Range for Self-Powered Micro Devices with mm-Size Antenna .....	359
<i>Natachai Terawatsakul, Alireza Saberhari, Atila Alvandpour</i>	
Performance and Stability Characterization of a 3rd Order Continuous-Time Delta-Sigma Modulator with Active Time-Constant Tuning.....	364
<i>Tobias Wolfer, Eckhard Hennig</i>	
A Fully Integrated SCC DC-DC Converter with Novel FMC Controller for Fast Transient Response .....	368
<i>Sahil Dalvi, Pilli Kalyan Kumar, Olive Ray, Nijwm Wary</i>	
Optimum Supply Voltage for High Gain Amplifier in Telemetry Circuitry for Ultra-Low Power Implantable Cardiac Pacemaker .....	373
<i>Manisha G, Amit Krishna Dwivedi, Uma Maheshwari V, Prasun Chakrabarti, Martin Margala</i>	
A High-Speed Charge-Injection Based Double Tail Latch for Decision Feedback Equalizer (DFE).....	378
<i>Suraj Kumar Prusty, V K Surya, Nijwm Wary</i>	
Low-Energy, Scalable, On-Demand State-Of-Charge Estimation System for Li-Ion Batteries. ....	383
<i>Dufour Jules, Savaria Yvon, David Jean-Pierre</i>	
A Fast Approach to Droplet Routing with Shape-Dependent Velocity on MEDA Biochips .....	388
<i>Kaito Mori, Chiharu Shiro, Hiroki Nishikawa, Xiangbo Kong, Hiroyuki Tomiyama, Shigeru Yamashita</i>	
Overview of Memristive Cryptography.....	393
<i>Iliia Polian, Nan Du, Werner Schindler</i>	
American Sign Language Recognition System Using Wearable Sensors and Machine Learning.....	398
<i>Modou Dibba, Cheol-Hong Min</i>	

Formal Analysis of Camouflaged Reconfigurable Circuits .....	403
<i>Steffen Märcker, Michael Raitza, Shubham Rai, Giulio Galderisi, Thomas Mikolajick, Jens Trommer, Akash Kumar</i>	
Fully Time-Based PID Controller for a High Frequency Buck Converter .....	408
<i>Nicolai J. Dahl, Pere L. Muntal, Michael A. E. Andersen</i>	
A 10-Bit 10 MS/s SAR ADC with Duty-Cycled Multiple Feedback Filter.....	413
<i>Hanyue Li, Yuting Shen, Eugenio Cantatore, Pieter Harpe</i>	
Low-Power Single-Slope ADC with a Replica Comparator for Always-On CIS Applications.....	418
<i>Hohyeon Lee, Minkyu Song, Soo Youn Kim</i>	
Random and Static Phase Errors in a PLL Array for Millimeter-Wave Frequency Generation.....	423
<i>Frank Herzel, Corrado Carta, Gunter Fischer</i>	
Time-Interpolated Vernier Digital-To-Time Converter with Applications in Time-Mode SAR TDC .....	428
<i>Daniel Junehee Lee, Fei Yuan, Yushi Zhou</i>	
An Asynchronous Single-Inductor Multi-Input Multi-Output DC-DC Converter for Ambient Energy Harvesting with 94.8% Peak Efficiency.....	432
<i>Hongjian Tan, Zhuo Gao, Guo Li, Ruiliang Song, Hao Wei, Mingyi Chen</i>	
A Parallel-Path Amplifier for Fast Output Settling.....	437
<i>Javad Bagheri Asli, Alireza Saberkari, Atila Alvandpour</i>	
Adaptive FOCV MPPT for Piezoelectric Energy Harvesting Circuit.....	441
<i>Lakhdar Mamouri, Vincent Frick</i>	
A Modular System-Level Testbench for 6G Beamforming Applications with Near Circuit-Level Fidelity .....	446
<i>Rikard Gannedahl, Javad Bagheri Asli, Henrik Sjolund, Atila Alvandpour</i>	
Localization of Miniature Ingestible Coils Using Tri-Polar Plane Type (TPT) Transmitter.....	451
<i>Lichen Yao, Sadeque Khan, Guido Dolmans, Jac Romme, Srinjoy Mitra</i>	
A 1,224-Channel 60 $\mu\text{m}$ Pitch Active Closed-Loop Stimulator for Selective Retinal Ganglion Cell Type Activation .....	456
<i>Philipp Löhler, Andreas Pickhinke, Andreas Erbslöh, Karsten Seidl</i>	
A 40 nA, 84% Efficient, PLL-Based Rectifier-Less Power Switching Converter for Low-Voltage Piezoelectric Energy Harvesting.....	460
<i>Raghav Bansal, Shouri Chatterjee</i>	
Linearized Analysis of Mid-Rise TDCs for Integer-N and Fractional-N Digital PLLs.....	465
<i>Xu Wang, Michael Peter Kennedy</i>	
Toward 2.5D Structures for Multi-Channel MEMS Acoustic-Based Digital Isolators Using Through Silicon Openings .....	470
<i>Hamid Sadrimanesh, Yves Blaquière, Frederic Nabki</i>	
A High-Accuracy Hysteretic DC-DC Converter Using a Spread-Spectrum EMI Suppression Technique with Double Gold Codes.....	475
<i>Tsung-Wen Sun, Meng-Ze Li, Tsung-Heng Tsai, Chia-Chan Chang</i>	
Triple Clock Boosted Voltage Multiplier: A Design Strategy to Heavily Reduce Rise Time.....	479
<i>Andrea Ballo, Alfio Dario Grasso, Gaetano Palumbo</i>	



Improving Hardware Efficiency of a Sparse Training Accelerator by Restructuring a Reduction Network.....	484
<i>Banseok Shin, Sehun Park, Jaeha Kung</i>	
Broadband RF Front-End Featuring a Reconfigurable Q-Enhanced Filter for Upper Mid-Band 6G Receivers.....	489
<i>Iman Ghotbi, Baktash Behmanesh, Markus Törmänen</i>	
Sparq: A Custom RISC-V Vector Processor for Efficient Sub-Byte Quantized Inference .....	494
<i>Théo Dupuis, Yoan Fournier, Mohammadhossein Askarihemmat, Nizar El Zarif, François Leduc-Primeau, Jean Pierre David, Yvon Savaria</i>	
High-Swing, Power-Efficient, Current-Mode Hybrid Circuit Topologies for Simultaneous Bidirectional Communication.....	499
<i>Prema Kumar Govindaswamy, P. Vijay Shankar</i>	
Benchmarking Multiplier Architectures for MAGIC Based In-Memory Computing.....	504
<i>Chandan Kumar Jha, Rolf Drechsler</i>	
A Method to Reduce the Design Complexity of Nanophotonic Interconnects.....	509
<i>Shayan Zohrei, Bayan Alsalem, Sébastien Le Beux</i>	
Integrated Architecture for Neural Networks and Security Primitives Using RRAM Crossbar.....	514
<i>Simranjeet Singh, Furqan Zahoor, Gokulnath Rajendran, Vikas Rana, Sachin Patkar, Anupam Chattopadhyay, Farhad Merchant</i>	
Modelling and Analysis of FPGA-Based MPSoC System with Multiple DNN Accelerators .....	519
<i>Cong Gao, Xuqi Zhu, Sangeet Saha, Klaus D McDonald-Maier, Xiaojun Zhai</i>	
A 12 GS/s RF-Sampler Employing Inductive Peaking with >57 dB  THD  and >49.3 dB SNDR in 22 nm FD-SOI CMOS.....	524
<i>Enne Wittenhagen, Patrick Kurth, Urs Hecht, Frowin Buballa, Sebastian Linnhoff, Nima Lotfi, Friedel Gerfers</i>	
Error Resilient Sleep Convention Logic Asynchronous Circuit Design.....	528
<i>Mithun Datta, Alexander Bodoh, Ashiq A. Sakib</i>	
A Neural Recording System with 16 Reconfigurable Front-End Channels and Memristive Processing/Memory Unit.....	533
<i>Xiongfei Jiang, Caterina Sbandati, Grahame Reynolds, Chaohan Wang, Christos Papavassiliou, Alexander Serb, Themis Prodromakis, Shiwei Wang</i>	
Variable Duty Cycle Pulse Generation for Low Complexity Randomization in Machine Learning .....	538
<i>Komal Krishnamurthy, Omar Ghazal, Tian Lan, Fei Xia, Alex Yakovlev, Rishad Shafik</i>	
High-Precision Time-To-Digital Conversion for Calibration of Outphasing Radio Transmitters .....	543
<i>Dhanashree Boopathy, Tze Hin Cheung, Andrei Spelman, Agnimesh Ghosh, Vesa Lampu, Lauri Anttila, Kari Stadius, Marko Kosunen, Jussi Ryyänen, Vishnu Unnikrishnan</i>	
An Autonomous Zero-Mask Unique ID Generation System for Next-Generation Neural Interfaces .....	548
<i>Berkay Özbek, Timothy G. Constandinou</i>	
Highly Integrated and Ultra-Compact Rectenna with Wireless Powering for Implantable Vascular Devices.....	553
<i>Jungang Zhang, Mahmoud Wagih, Daniel Hoare, Nosrat Mirzai, John Mercer, Rupam Das, Hadi Heidari</i>	

Fiber-Bragg-Grating Coupled Magnetostrictive Sensors for Magnetic Tracking of Biomedical Implants .....	558
<i>Mahdieh Shojaei Baghini, Kristiaan Broekens, Michiel Oderwald, Paul Breedveld, Hadi Heidari, Maurits Van Der Heiden</i>	
An Ultra-Wideband Amplifier with Compact Magnetically Coupled Feedback Gain Cell.....	562
<i>Weiping Wu, Shi Chen, Xun Bao, Lei Zhang, Yan Wang</i>	
Doherty Power Amplifier with Compact Load Modulation Network for 5G Applications.....	566
<i>Praveen Saraswat, Mahima Arrawatia</i>	
A Compensation Scheme for Three-Stage OTAs with No Miller Capacitors.....	571
<i>Urvashi Bansal, Alfio Dario Grasso</i>	
A Current-Mode Implementation of a Nearest Neighbor STDP Synapse .....	575
<i>Akwasi Akwaboah, Ralph Etienne-Cummings</i>	
Analysis and Design of a 7 Gb/s Rotatable Non-Contact Connector with Grid Array Package Application .....	580
<i>Ximing Wang, Atsutake Kosuge, Yasuhiro Hayashi, Kota Shiba, Mototsugu Hamada, Tadahiro Kuroda</i>	
Phase Space Reconstruction Based Methodology for Real Time Impact Assessment of Corrosion on Structural Health of Ship Material Using In-Situ Acoustic Emission Sensors .....	584
<i>Prasannata Bhange, Deepak Kumar Joshi, Amit Acharyya, Sunil Kumar Pandu, Kamal Mankari, Swati Ghosh Acharyya</i>	
A 433MHz Multi-Mode Wake-Up Receiver Achieving High Sensitivity Via Balun LNA and Injection Locked Oscillator .....	589
<i>Pin-Chen Yeh, Shih-En Chen, Kuang-Wei Cheng</i>	
PWM Controlled 180° Analog Phase Shifter .....	593
<i>Sushmita Ghosh, Shouri Chatterjee, Swades De, Ajay K. Poddar, Ulrich L. Rohde</i>	
Streaming Convolutional Neural Network FPGA Architecture for RFSoc Data Converters .....	597
<i>Andrew Maclellan, Louise H. Crockett, Robert W. Stewart</i>	
A Low-Noise CMOS Front-End with 534 M $\Omega$ Transimpedance Gain for Single-Molecule Signal Acquisition .....	602
<i>Chenyu Ma, Shanci Hu, Yuhang Hu, Tao Deng, Yuliang Han, Yi Li, Yuan Gao</i>	
Technology-Aware Drift Resilience Analysis of RRAM Crossbar Array Configurations.....	607
<i>Daniel Reiser, Marc Reichenbach, Tommaso Rizzi, Andrea Baroni, Markus Fritscher, Christian Wenger, Cristian Zambelli, Davide Bertozzi</i>	
Architectural Exploration for Energy-Efficient LMS and NLMS Adaptive Filters VLSI Design.....	612
<i>Pedro T. L. Pereira, Guilherme Paim, Eduardo Costa, Paulo Flores, Sergio Bampi</i>	
Efficiency and Sustainability in Simulation: Enhancing Accuracy of Chaotic Maps Using Kahan Summation .....	617
<i>Thalita Nazaré, Samir Martins, Erivelton Nepomuceno</i>	
Iterative Pruning Algorithm for Efficient Look-Up Table Implementation of Binary Neural Networks .....	622
<i>Amirali Ebrahimi, Vineeth Narayan Pullu, J. M. Pierre Langlois, Jean-Pierre David</i>	

A Single-Turn Inductor Based Compact and Wide-Tuning LC-VCO Using Dual-Resonant Modes .....	627
<i>Ritesh Sachdeva, Abhishek Kumar</i>	
Nano-Magnetic Logic Based Architecture for Edge Inference Using Tsetlin Machine.....	632
<i>C Kishore, Santhosh Sivasubramani, Rishad Shafik, Amit Acharyya</i>	
A 4 GBaud 5 Vpp Class-B Pre-Driver Design for GaN-Based Switching Power Amplifier in 22 nm SOI-CMOS Utilizing LDMOS.....	637
<i>Frowin Buballa, Sebastian Linnhoff, Enne Wittenhagen, Urs Hecht, Friedel Gerfers</i>	
A 5-DC-Parameter MOSFET Model for Circuit Simulation in QucsStudio and SPECTRE.....	642
<i>Deni Germano Alves Neto, Cristina Missel Adotnes, Gabriel Maranhão, Mohamed Khalil Bouchoucha, Manuel J. Barragan, Andreia Cathelin, Marcio Cherem Schneider, Sylvain Bourdel, Carlos Galup-Montoro</i>	
A Spur-Free Dynamic Element Matching Scheme for Bandpass DACs .....	647
<i>Jarrah Bergeron, Sudhakar Pamarti</i>	
100Gbit/s RF Sample Offload for RFSoc Using GNU Radio and PYNQ .....	652
<i>Marius Šiauciulis, David Northcote, Josh Goldsmith, Louise H. Crockett, Šarunas Kaladė</i>	
A Feasibility Study on Textile Electrodes for Transcutaneous Electrical Nerve Stimulation.....	657
<i>Wei Ju, Aidan McConnell-Trevillion, Sadeque Reza Khan, Kianoush Nazarpour, Srinjoy Mitra</i>	
Efficient Transistor-Level QDI Asynchronous Switch for Neuromorphic Systems .....	662
<i>Shahzad Haider, Junhao Liang, Song Chen</i>	
Statistical Model Checking Based Analysis of Fault Trees and Power Consumption to Enhance Autonomous Systems Reliability .....	667
<i>Ashkan Samadi, Marwan Ammar, Otmane Ait Mohamed</i>	
A Computationally Efficient Predistortion and Segment Thresholding for Distributed PA Arrays.....	672
<i>Rahul Mushini, John Dooley</i>	
Battery-Free Bluetooth Low Energy Wireless Sensor Powered by Radiative Wireless Power Transfer .....	676
<i>Alassane Sidibe, Gaël Loubet, Alexandru Takacs, Lamoussa Sanogo, Daniela Dragomirescu</i>	
A Low-Voltage Submicrowatt, High-Speed CMOS Dynamic Comparator.....	680
<i>Fatemeh Shakibae, Benoit Gosselin</i>	
SqueezeNetVLAD: High-Speed Power and Memory Efficient GPS Less Accurate Network Model for Visual Place Recognition on the Edge .....	685
<i>Chandrajit Pal, Pratibha Verma, Himanshu Rohit, Dubacharla Gyaneshwar, Sumohana S. Channappayya, Amit Acharyya</i>	
Anomaly Behaviour Tracing of CHERI-RISC V Using Hardware-Software Co-Design .....	690
<i>Michal Borowski, Chandrajit Pal, Sangeet Saha, Ludovico Poli, Xiaojun Zhai, Klaus D McDonald-Maier</i>	
Energy-Efficient and High Speed Active Cell Balancing Methodology for Lithium-Ion Battery Pack .....	695
<i>Arghadeep Sarkar, Rashi Dutt, Souris Sahu, Amit Acharyya</i>	
A Multi-Modal Stimulator System for Visual Prosthesis .....	700
<i>Emad A. Abdo, Peimin Yuan, Yujin Zheng, Alex Yakovlev, Patrick Degenaar</i>	

A Shared Synapse Architecture for All-Optical Spiking Neural Networks .....	705
<i>Milad Eslaminia, Sébastien Le Beux</i>	
A Low Power Ultra-Wideband RF Receiver Front-End Using a Differential N-Path Notch Filter.....	710
<i>Ali Poursaadati Zinjanab, Nakisa Shams, Frederic Nabki</i>	
Improved Dynamic Comparator with Adaptive Delay Line for the Latch Conduction and Regenerative Feedback Assisted FIA .....	714
<i>Feng Tai, Qiang Li</i>	
PSIJ Transfer Function Response Prediction Via NARNET and KBNNs.....	719
<i>Ahsan Javaid, Ramachandra Achar</i>	
3D Printed Graphite Based Flexible Thermoplastic Polyurethane Electromyography Electrode .....	722
<i>Jonathan Lévesque, Félix Chamberland, Benoit Gosselin</i>	
Toward a Polysilicon-Based Electrostatically Actuated DC MEMS Switch .....	727
<i>Abdurrashid Hassan Shuaibu, Yves Blaquière, Frédéric Nabki</i>	
A Necessary and Sufficient Condition to Generate Representative Clip for Edge-Constrained Clustering of Layout Pattern Classification Problem .....	731
<i>Kunihiro Fujiyoshi, Tomoya Masutani</i>	
A Dual-Output Picowatt Hybrid Voltage Reference with Digital Trimming Technique.....	735
<i>Yilun Jin, Yuhang Zhang, Zhiwen Gu, Jian Zhao, Zhihong Luo, Yanhan Zeng, Yongfu Li</i>	
CMOS Continuous-Time Integrator with Capacitance Multiplier.....	740
<i>Hiroki Sato, Shigetaka Takagi</i>	
A High Dynamic-Range Readout Circuit with Differential Resistance-To-Time Conversion for Gas Sensor .....	745
<i>Tzung-Je Lee, Meng-Lin Tsai</i>	
CMOS Temperature Sensor Utilizing Gate-Length-Based Threshold Voltage Modulation .....	749
<i>Mahfuzul Islam, Shogo Harada, Takashi Hisakado, Osami Wada</i>	
A New Current-Mode Subthreshold, High-PSRR MOSFET-Only Bandgap Voltage Reference .....	754
<i>Reza Papi, Fereidoon Hashemi Noshahr, Benoit Gosselin</i>	
A sub-MW Ultra-Low Power Low-Voltage LED Driver for a Patch Pulse Oximetry.....	759
<i>Mahziar Serri Mazandarani, Gabriel Gagnon-Turcotte, Mohamad Sawan, Benoit Gosselin</i>	
Mismatch and Offset-Voltage Compensation Technique for Current Excitation Based Resistive Sensors Interface .....	763
<i>Mehreeq Mushtaq, Mohammad Idris Wani, Sadan Saquib, Meraj Ahmad, Laxmeesha Somappa, Maryam Shojaei Baghini, Hadi Heidari, Shahid Malik</i>	
Portable Diagnostic Platform for Rapid Detection of 2 $\mu$ L Paramagnetic Particles in 5s .....	768
<i>Yuanxi Cheng, Siming Zuo, Lisa Ranford-Cartwright, Nosrat Mirzai, Hadi Heidari</i>	
Extremely Random Forest Based Automatic Tonic-Clonic Seizure Detection Using Spectral Analysis on Electroencephalography Data.....	772
<i>Craig Stewart, Wai Keung Fung, Nazila Fough, Radhakrishna Prabhu</i>	
Enhancing Real-World Inverted Pendulum Stabilization: Addressing External Perturbations with Feedback and Model Predictive Control .....	774
<i>Thalita Nazaré, Josefredo Gadelha, Erivelton Nepomuceno</i>	

UPF-Aware CDC Structural Verification on RTL .....	776
<i>Diana Kalel, Jean-Christophe Brignone, Irene Serre, Julian Massicot, Jerome Avezou</i>	
Modeling and Simulation of Heterojunction Solar Cell; Determination of Optimal Values .....	778
<i>Sani Mohammed Lawal, Nazila Fough, Nazmi Sellami, Firdaus Muhammad-Sukki</i>	
Decentralised Biomedical Signal Classification Using Early Exits.....	780
<i>Li Xiaolin, Hans Vandierendonck, Dimitrios S. Nikolopoulos, Bo Ji, Barry Cardiff, Deepu John</i>	
Sensor Node Design and Evaluation for Quality Assurance of Drugs .....	782
<i>Maria Frontera-Bergas, Bartomeu Oliver-Riera, Josep Genovard-Oliver, Miguel Vinaixa-Fernández, Eugeni M. Isern-Riutort, Jaume Ramis-Bibiloni, Miquel J. Roca-Adrover, Bartomeu Alorda-Ladaria</i>	
Leakage Power Attack and Half Select Issue Resilient Split 8T SRAM Cell.....	784
<i>Syed Farah Naz, Mansi Chawla, Ambika Prasad Shah</i>	
Modular Processor Architecture with Cryptography ISA Extensions .....	786
<i>Oren Ganon, Itamar Levi</i>	
Fully Parallel, Flexible, and Conflict-Free Interleaver Design Using Processing in Memory .....	788
<i>Mojtaba Mahdavi</i>	
RFSoc Implementation of Runtime Reconfigurable Numerologies for 5G New Radio.....	790
<i>Lewis J. Brown, Louise H. Crockett, Robert W. Stewart</i>	
Next-Generation Battery Management System Design Methodology .....	792
<i>Rashi Dutt, Souris Sahu, Arghadeep Sarkar, Amit Acharyya</i>	
Fault Tolerant Processing Unit Using Gamma Distribution Sliding Window for Autonomous Landing Guidance System.....	794
<i>Hossam O. Ahmed</i>	

**Author Index**