

# **2009 European Conference on Circuit Theory and Design (ECCTD 2009)**

**Antalya, Turkey  
23-27 August 2009**

**Pages 1-452**



IEEE Catalog Number: CFP09ECC-PRT  
ISBN: 978-1-4244-3895-2

# Table of Contents

## **A1L-A CMOS Sensory Systems**

Date: Monday, August 24, 2009  
Time: 13:30 - 15:10  
Place: Attaleia  
Chair: Sandro Carrara; EPFL

<b>APS Design Alternatives in 0.18<math>\mu</math>m CMOS Image Sensor Technology</b> .....	<b>1</b>
Sonia Vargas-Sierra, Elisenda Roca, Gustavo Liñán-Cembrano, <i>Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla</i>	
<b>A Ring-Oscillator-Based Active Quenching and Active Recharge Circuit for Single Photon Avalanche Diodes</b> .....	<b>5</b>
Markus Grönholm, Jonne Poikonen, Mika Laiho, <i>University of Turku</i>	
<b>Double Modified Internal Gate (MIG) Pixel for Fluorescence Imaging Applications</b> .....	<b>9</b>
Daniel Durini, <i>Fraunhofer Institut für Mikroelektronische Schaltungen und Systeme</i> ; Artto Aurola, <i>Pixpolar OY</i> ; Werner Brockherde, <i>Fraunhofer Institut für Mikroelektronische Schaltungen und Systeme</i> ; Bedrich Hosticka, <i>University of Duisburg-Essen</i> ; Anton Grabmaier, <i>Fraunhofer Institut für Mikroelektronische Schaltungen und Systeme</i>	
<b>A Low Power CMOS Capacitance to Pulse Duration Converter Based on a Dual Clock Approach</b> .....	<b>13</b>
Michele Dei, Federico Butti, Paolo Bruschi, <i>University of Pisa</i> ; Massimo Piotto, <i>IEIT -Pisa CNR</i>	
<b>Behavior of Various Geometry MagFET Structures</b> .....	<b>17</b>
Martin Daricek, Martin Donoval, Alexander Satka, <i>Slovak University of Technology in Bratislava</i>	

## **A1L-B Analog Filters I**

Date: Monday, August 24, 2009

Time: 13:30 - 15:10

Place: Perge

Chair: Edgar Sánchez-Sinencio; *Texas am University*

### **Novel Electronically Tunable FDNR Simulator Employing Single FDCCII .....21**

Fýrat Kacar, *Istanbul University*; Hakan Kuntman, *Istanbul Technical University*

### **Syllabic Companding Baseband Switched Capacitor Filter for WLAN 802.11a/G Receivers.....25**

Vaibhav Maheshwari, Wouter A Serdijn, *Delft University of Technology*

### **A Novel Complex Gm-C IF Sub-Sampling Mixer.....29**

Viswanathan Balasubramanian, Aravind Heragu, Christian Enz, *Ecole Polytechnique Fédérale de Lausanne*

### **A New 2nd Order Variable-State Filter: the Frequency Agile Filter .....33**

Yahya Lakys, Alain Fabre, *IMS-Bordeaux Laboratory*; Balwant Godara, *Institut Supérieur d'Electronique de Paris*

### **Capacitance Spread Reduction Technique for Low-Cost Switched-Capacitor Filters Implementation .....37**

Nicodimus Retdian, Katsuyuki Takagi, Shigetaka Takagi, *Tokyo Institute of Technology*

## **A1L-C Mixed Signal Circuit & Systems I**

Date: Monday, August 24, 2009

Time: 13:30 - 15:10

Place: Aspendos

Chair: Devrim Yilmaz Aksin; *Istanbul Technical University*

### **Ultra Low Power Flash ADC for UWB Transceiver Applications .....41**

Mohammad Masoumi, Erik Markert, Ulrich Heinkel, *Chemnitz University of Technology*; Georges Gielen, *Katholieke Universiteit Leuven*

### **Adaptive Equalization for Calibration of Subband Hybrid Filter Banks A/D Converters .....45**

Zhiguo Song, Caroline Lelandais-Perrault, Daniel Poulton, Philippe Bénabes, *Ecole Supérieure d'Electricité*

### **A 14-Bit MOS DAC with Current Sources Free from Power-Line Voltage Drop and with Output Circuits Free from Code-Dependent Variable Time Constant .....49**

Toru Sai, Yasuhiro Sugimoto, *Chuo University*

### **Completely First Order and Tone Free Partitioned Data Weighted Averaging Technique Used in a Multibit Delta Sigma Modulator .....53**

Esmail Najafi Aghdam, *Sahand University of Technology*; Philippe Benabes, *SUPELEC*; Javad Abbasszadeh, *Sahand University of Technology*

**A1L-D Digital VLSI Circuit Design**

Date: Monday, August 24, 2009

Time: 13:30 - 15:10

Place: Side

Chair: Gaetano Palumbo; *University of Catania*

**Dual-Edge Triggered Energy Recovery DCCER Flip-Flop for Low Energy Applications .....57**  
Seyed Ebrahim Esmaeili, Asim Al-Khalili, Glenn Cowan, *Concordia University*

**Impact of Clock Slope on Energy/Delay of Pulsed Flip-Flops and Optimum Clock Domain Design .....61**  
Massimo Alioto, *University of Siena*; Elio Consoli, Gaetano Palumbo, *University of Catania*

**4-Bit Ripple Carry Adder of Two-Phase Clocked Adiabatic Static CMOS Logic: a Comparison with Static CMOS .....65**  
Nazrul Anuar, Yasuhiro Takahashi, *Gifu University*; Toshikazu Sekine, *Gifu University*

**Ultra Low Voltage and High Speed CMOS Carry Generate Circuits .....69**  
Yngvar Berg, Omid Mirmotahari, *University of Oslo*

**Topology Selection of FPGA Look-Up Tables for Low-Leakage Operation .....73**  
Pradeep Nair, Santosh Koppa, Eugene John, *University of Texas at San Antonio*; Dhireesha Kudithipudi, *Rochester Institute of Technology*

**A1L-E Cellular Nonlinear Networks: Theory, Applications & Implementations.**

Date: Monday, August 24, 2009  
Time: 13:30 - 15:10  
Place: Hadrian  
Chair: Marco Gilli; *Politecnico di Torino*  
Ronald Tetzlaff; *Technical University of Dresden*

**Quasi Global-Equivalence in One-Dimensional Binary Cellular Automata.....77**

Giovanni Paziienza, *Computer and Automation research Institute of the Hungarian Academy of Sciences*; Leon Chua, *University of California, Berkeley*

**New Wave Profiles in Viscoelastic Burgers' RTD-Based Cellular Neural Networks Model.....81**

Angela Slavova, *Bulgarian Academy of Sciences*

**Variational Computing Based Images Denoising Methods by Using Cellular Neural Networks .....85**

Alexandru Gacsadi, *University of Oradea*; Peter Szolgay, *Computer and Automation research Institute of the Hungarian Academy of Sciences*

**Design of New CMOS Current Mode Min and Max Circuits for FLC Chip Applications.....89**

Ghader Yosefi, *Mahabad Azad University*; Sattar Mirzakouchaki, *Science and Research of Islamic Azad University*; Shilan Neda, *Mahabad Azad University*

**Locally Adaptive Image Sensing with the 64x64 Cell MIPA4k Mixed-Mode Image Processor Array .....93**

Jonne Poikonen, Mika Laiho, Ari Paasio, *University of Turku*

## **A2L-A SPECIAL SESSION: New Trends in A/D Converters Design & Testing I**

Date: Monday, August 24, 2009

Time: 15:40 - 17:40

Place: Attaleia

Chair: Jose L. Huertas; *IMSE, CNM, Spain*

### **on-Line Estimation of the Integral Non-Linear Errors in Analogue-to-Digital Converters without Histogram Evaluation ..... 97**

Antonio Jose Ginés, Eduardo Jose Peralías, Adoración Rueda, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*

### **A Survey on Digital Background Calibration of ADCs ..... 101**

Antonio Jose Ginés, Eduardo Jose Peralías, Adoración Rueda, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*

### **On-Chip Stimuli Generation for ADC Dynamic Test by Sigma-Delta Technique ..... 105**

Shakeel Ahmad, Jerzy Dabrowski, *Linköping University*

### **New Applications and Technology Scaling Driving Next Generation A/D Converters ..... 109**

Heng Zhang, Mohamed Mostafa Elsayed, Edgar Sánchez-Sinencio, *Texas A&M University*

### **Signal Generators for Cost Effective BIST of ADCs ..... 113**

Bharath Karthik Vasan, Jingbo Duan, Chen Zhao, Randall Geiger, Degang Chen, *Iowa State University*

### **Generalized Multiplying D/A Converter Stages for Low Power Pipelined A/D Converters ..... 117**

Erkan Isa, *Commissariat à l'Énergie Atomique-LETI*; Dominique Morche, *Commissariat à l'Énergie Atomique-LETI-Minatec*; Catherine Dehollain, *Ecole Polytechnique Fédérale de Lausanne*

## **A2L-B Analog Filters II**

Date: Monday, August 24, 2009

Time: 15:40 - 17:40

Place: Perge

Chair: Franco Maloberti; *University of Pavia*

### **Design of High-Frequency Gm-C Wavelet Filters ..... 121**

Wenshan Zhao, Yichuang Sun, Xi Zhu, *University of Hertfordshire*; Yigang He, *Hunan University*

### **A New OTA-C Universal Biquad Resonates Out the Main Parasitic Capacitance ..... 125**

Marius Neag, Raul Onet, Marina Topa, *Technical University of Cluj-Napoca*

### **Novel Structures of RC-Active Filters for Tapped Capacitor Resonant Circuits ..... 129**

Marian Pierzchala, *Wroclaw University of Technology*; Mourad Fakhfakh, *University of Sfax*

### **Current-Mode SITO Filter Using a Single Active Component ..... 133**

Umut Engin Ayten, *Yildiz Technical University*; Mehmet Sagbas, *Maltepe University*; Herman Sedef, *Yildiz Technical University*

### **On the Cascade Control System Tuning for Shunt Active Filters Based on Modulus Optimum Criterion ..... 137**

Mihaela Popescu, Alexandru Bitoleanu, Mircea Dobriceanu, Mihaita Linca, *University of Craiova*



**A2L-C Nonlinear Systems II**

Date: Monday, August 24, 2009

Time: 15:40 - 17:40

Place: Aspendos

Chair: Martin Hasler; *EPFL*

**Performance Evaluation of LFSR-Based Spreading Sequences with Negative Auto-Correlation Designed by Chaos Theory of Modulo-2 Added Sequences..... 141**

Akio Tsuneda, Yasunori Miyazaki, *Kumamoto University*

**Circuit Implementation of Piecewise-Affine Functions Based on a Binary Search Tree..... 145**

Alberto Oliveri, Andrea Oliveri, Tomaso Poggi, Marco Storace, *University of Genoa*

**A Parameter-Varying Lowpass Filter with Reduced Transient Response ..... 149**

Miguel Angel Gutierrez de Anda, *INAOE*; Isabelo Meza Dector, Juan Carlos Sanchez Garcia, *ESIME Culhuacan*

**Dynamic Translinear Nonlinear Energy Operator ..... 153**

Senad Hiseni, Chutham Sawigun, Wouter A. Serdijn, *Delft University of Technology*

**A2L-D VLSI Design for Digital Signal**

Date: Monday, August 24, 2009

Time: 15:40 - 17:40

Place: Side

Chair: Majid Ahmadi; *University of Windsor, Canada*

**High Performance 16-Bit MCML Multiplier ..... 157**

Yavuz Delican, *Bogazici University*; Avni Morgul, *Beykent University*

**High Speed VLSI Implementation of a Finite Field Multiplier Using Redundant Representation ..... 161**

Ashkan Hosseinzadeh Namin, Karl Leboeuf, Robertoo Muscedere, Huapeng Wu, Majid Ahmadi, *University of Windsor*

**Hardware Efficient Fixed-Point VLSI Architecture for 2D Kurtotic FastICA..... 165**

Amit Acharyya, Koushik Maharatna, Jinhong Sun, Bashir M. Al-Hashimi, Steve Gunn, *University of Southampton*

**A Voltage Equalizer Applying a Charge Pump for Energy Storage Systems ..... 169**

Tomoshige Inoue, Hirotaka Koizumi, *Tokyo University of Science*

**A2L-E SPECIAL SESSION: Focal-Plane Sensor-Processor Chip Implementation**

Date: Monday, August 24, 2009

Time: 15:40 - 17:40

Place: Hadrian

Chair: Akos Zarandy; *Hungarian Academy of Sciences*

**A Focal Plane Processor for Continuous-Time 1-D Optical Correlation Applications..... 173**

Gustavo Linan-Cembrano, Luis Carranza, Betsaida Alexandre, Elisenda Roca, Angel Rodriguez-Vazquez, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*

**Omnidirectional Algorithm for the Full Penetration Hole Extraction in Laser Welding Processes..... 177**

Leonardo Nicolosi, Ronald Tetzlaff, *Dresden University of Technology*; Felix Abt, *Forschungsgesellschaft für Strahlwerkzeuge mbH*; Andreas Blug, Heinrich Höfler, Daniel Carl, *Fraunhofer Institut für Physikalische Messtechnik IPM*

**The Memristive Grid Outperforms the Resistive Grid for Edge Preserving Smoothing ..... 181**

Feijun Jiang, Bertram Shi, *Hong Kong University of Science and Technology*

**3D Multi-Layer Vision Architecture for Surveillance and Reconnaissance Applications..... 185**

Peter Földesy, *Computer and Automation research Institute of the Hungarian Academy of Sciences*; Ricardo Carmona-Galan, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*; Akos Zarandy, *Computer and Automation research Institute of the Hungarian Academy of Sciences*; Csaba Rekeczky, *Eutecus Inc*; Angel Rodríguez-Vázquez, *AnaFocus*; Tamás Roska, *Computer and Automation research Institute of the Hungarian Academy of Sciences*

**Space-Dependent Binary Image Processing Within a 64x64 Mixed-Mode Array Processor..... 189**

Mika Laiho, Jonne Poikonen, Ari Paasio, *University of Turku*

**A Pixel-Parallel Cellular Processor Array in a Stacked Three-Layer 3D Silicon-on-Insulator Technology..... 193**

Piotr Dudek, Alexey Lopich, *University of Manchester*; Viktor Gruev, *Washington University*

**A3P-F Analog & Mixed Signal Circuits**

Date: Monday, August 24, 2009

Time: 13:30 - 14:30

Place: Poster Area

Chair: Valeri Mladenov; *Technical University of Sofia*

**On a Filter Bank Correction Scheme for Mitigating Mismatch Distortions in Time-Interleaved Converter Systems ..... 197**

Michael Soudan, Ronan Farrell, *National University of Ireland, Maynooth*

**An Area-Speed Efficient Method for Current Mode Analog to Digital Converters ..... 201**

Golnar Khodabandehloo, Mitra Mirhassani, Majid Ahmadi, *University of Windsor*

**A CMOS 3.2 GB/S Serial Link Transceiver, Using PWM and PAM Scheme ..... 205**

Nooshin Ghaderi, Khayrollah Hadidi, *Urmia University*

## **A4P-F Analog Circuit Design & Signal Processing I**

Date: Monday, August 24, 2009

Time: 15:40 - 16:40

Place: Poster Area

Chair: Milan Stork; *University of West Bohemia*

### **Design and Implementation of Operational Amplifiers with Programmable Characteristics in a 90nm CMOS Process.....209**

Sherlyn Dela Cruz, Mark Gerard Delos Reyes, Terence Gaffud, Tanya Vanessa Abaya, Maria Theresa Gusad, Marc Rosales, *University of the Philippines*

### **A New Linear Readout Circuit for a CMOS Image Sensor.....213**

Masood Teymouri, Khayrollah Hadidi, Abdollah Khoei, *Urmia University*

### **An Eigenvalue Study of a Double Integrator Oscillator.....217**

Erik Lindberg, *Technical University of Denmark*; K Murali, *Anna University*; Arunas Tamasevicius, *Semiconductor Physics Institute*; Lutz V. Wangenheim, *Hochschule Bremen*

### **A Current-Mode Euclidean Distance Calculator Based on Electronically Simulated Translinear Principle.....221**

Ebrahim Farshidi, *Shahid Chamran University of Ahvaz*

### **Single-Input Multi-Output Resistorless Current-Mode Biquad.....225**

Dalibor Bielek, *University of Defence in Brno/BUT*; Viera Biolkova, Zdenek Kolka, *Brno University of Technology*; Josef Bajer, *University of Defence in Brno*

### **A New Current-Mode Square-Root-Domain Notch Filter.....229**

Ali Kircay, Mehmet Serhat Keserlioglu, *Pamukkale University*; Ugur Cam, *Dokuz Eylül University*

### **A CMOS Front End for a Laser Rangefinder with Resonance-Based Timing Discrimination.....233**

Jani Pehkonen, Juha Kostamovaara, *University of Oulu*

**B1L-A Nonlinear System Modelling**

Date: Tuesday, August 25, 2009  
Time: 10:30 - 12:10  
Place: Attaleia  
Chair: Joos Vandewalle;

**Piecewise-Polynomial Modeling for Analog Circuit Performance Metrics.....237**

Hubert Filiol, Ian O’connor, *Lyon Institute of Nanotechnology – UMR 5270*; Dominique Morche, *Commissariat à l’Énergie Atomique-LETI-Minatec*

**Modelling the Single-Electron Transistor with Piecewise Linear Functions .....241**

Arturo Sarmiento-Reyes, Luis Hernandez-Martinez, Miguel Angel Gutierrez de Anda, Francisco Javier Castro-Gonzalez, *INAOE*

**Lagrangian Modeling of DC-DC Buck-Boost and Flyback Converters.....245**

Huseyin Alpaslan Yýldýz, *Marmara Research Center Energy Institute/Scientific and Technological Research Council of Turkey*; Leyla Goren-Sumer, *Istanbul Technical University*

**SPICE Modeling of Memristive, Memcapacitative and Meminductive Systems .....249**

Dalibor Biolk, *University of Defence in Brno/BUT*; Zdenek Biolk, *SSIER Roznov p.R*; Viera Biolkova, *Brno University of Technology*

**Properties of Silicon Carbide Schottky Diodes Under Self-Heating Influence .....253**

Janusz Zarebski, Jacek Dabrowski, *Gdynia Maritime University*

**B1L-B Analog Integrated Circuits I**

Date: Tuesday, August 25, 2009

Time: 10:30 - 12:10

Place: Perge

Chair: Hakan Kuntman; *Istanbul Technical University*

**A Low Voltage CMOS Analog Multiplier with High Linearity .....257**

Amir H. Miremadi, *Islamic Azad University-West Tehran Branch*; Ahmad Ayatollahi, Adib Abrishamifar, *Iran University of Science & Technology*; Alireza Siadatan, *Islamic Azad University-West Tehran Branch*

**Compact Low-Voltage Rail-to-Rail Bulk-Driven CMOS Opamp for Scaled Technologies .....263**

Juan M. Carrillo, Raquel Pérez-Aloe, José M. Valverde, J Francisco Duque-Carrillo, *University of Extremadura*; Guido Torelli, *University of Pavia*

**Input Common-Mode Voltage Behaviour of CMOS Bulk-Driven Differential Stages .....267**

Juan M. Carrillo, Miguel A. Domínguez, J. Francisco Duque-Carrillo, *University of Extremadura*; Guido Torelli, *University of Pavia*

**B1L-C Wireless RFICs**

Date: Tuesday, August 25, 2009

Time: 10:30 - 12:10

Place: Aspendos

Chair: Jussi Ryyänen; *Helsinki University of Technology*

**A Concurrent Quadrature Sub-Sampling Mixer for Multiband Receivers .....271**

Aravind Heragu, Viswanathan Balasubramanian, *Ecole Polytechnique Fédérale de Lausanne*;

Christian Enz, *Ecole Polytechnique Fédérale de Lausanne & Swiss Center for Electronics and*

*Microtechnology*

**Agile Frequency Synthesizer for Cognitive Radios .....275**

Liangge Xu, Kari Stadius, Tapio Rapinoja, Jussi Ryyänen, *Helsinki University of Technology*

**A Tunable Multi-Band CMOS LNA for Mobile WiMAX .....279**

Abbas Bayramnejad, Davud Asemanni, Saadan Zokaei, *Khaje Nasir Toosi University of Technology*

**Spectrum Estimator and Cyclostationary Detector for Cognitive Radio.....283**

Vesa Turunen, Marko Kosunen, *Helsinki University of Technology*; Sami Kallioinen, Aarno

Pärssinen, *Nokia Research Center*; Jussi Ryyänen, *Helsinki University of Technology*



**B1L-D Circuit Theory**

Date: Tuesday, August 25, 2009

Time: 10:30 - 12:10

Place: Side

Chair: Ahmed Elwakil; *University of Sharjah*

**Critical Issues and Current Views on Teaching Basic Circuits and Systems in Electrical Engineering Education.....287**

Joos Vandewalle, *Katholieke Universiteit Leuven*

**Model Reduction of Linear Networks with Nonlinear Elements.....291**

Stefan Ludwig, Wolfgang Mathis, *University Hannover*

**Cascaded Lossless Commensurate Line Synthesis.....295**

Metin Sengül, *Kadir Has University*

**A Modified Method for Circuit Analysis Using Haar Wavelet Transform with Adaptive Resolution -for Circuits with Waveform with Sharp Convex Ranges-.....299**

Masanori Oishi, Seiichiro Moro, *University of Fukui*; Tadashi Matsumoto, *Fukui University of Technology*

**On Synthesis of Immitance Matrices of Transformerless RLC Networks.....303**

Dragan Kandic, Reljin Branimir, *University of Belgrade*

**B1L-E Neural Networks: Modeling & Design**

Date: Tuesday, August 25, 2009

Time: 10:30 - 12:10

Place: Hadrian

Chair: Peter Szolgay; *Hungarian Academy of Sciences*

**Single-Ended Input Four-Quadrant Multiplier for Analog Neural Networks.....307**

Devrim Aksin, Basak Basyurt, Ugur Uyanik, *Istanbul Technical University*

**Hardware-Aware Model of Sigma-Delta Cellular Neural Network .....311**

Hisashi Aomori, *Tokyo University of Science*; Yuki Naito, *Sophia University*; Tsuyoshi Otake, *Tamagawa University*; Nobuaki Takahashi, *IBM Japan, Ltd*; Ichiro Matsuda, Susumu Itoh, *Tokyo University of Science*; Mamoru Tanaka, *Sophia University*

**Crosswalks Recognition Through CNNs for the Bionic Camera: Manual Vs. Automatic Design.....315**

Mihály Radványi, *Pázmány Péter Catholic University*; Giovanni E. Paziienza, *Computer and Automation research Institute of the Hungarian Academy of Sciences*; Kristóf Karacs, *Pázmány Péter Catholic University*

**A Micropower Neural Recording Amplifier with Improved Noise Efficiency Factor .....319**

Vahid Majidzadeh Bafar, Alexandre Schmid, Yusuf Leblebici, *Ecole Polytechnique Fédérale de Lausanne*

**An Efficient Inverse ANN Modeling Approach Using Prior Knowledge Input with Difference Method .....323**

Murat Simsek, N. Serap Sengör, *Istanbul Technical University*

**B2L-A Oscillators & PLLs**

Date: Tuesday, August 25, 2009  
Time: 13:30 - 15:30  
Place: Attaleia  
Chair: Erik Lindberg; *Technical University of Denmark*

**Improved Harmonic Balance Technique for Analysis of Ring Oscillators.....327**

Mark Gourary, Sergey Rusakov, Sergey Ulyanov, Michael Zharov, *Research Institute for Design Problems in Microelectronics*

**Excitation of Multiple Spatial Modes of a MEMS Cantilever in the Pulsed Digital Oscillator.....331**

Elena Blokhina, Orla Feely, *University College Dublin*; Manuel Domínguez, *Universitat Politècnica de Catalunya*

**Phase Model Reduction and Synchronization of Nonlinear Oscillators by a Periodic Force .....335**

Michele Bonnin, Fernando Corinto, Marco Gilli, *Politecnico di Torino*

**Nonlinear Analysis of Quadrature LC-VCOs .....339**

Antonio Buonomo, Alessandro Lo Schiavo, *Seconda Università degli Studi di Napoli*

**Nonlinear Dynamics of Alias-Locked Loop.....343**

Chuang Bi, Orla Feely, *University College Dublin*

**B2L-B Analog Integrated Circuits II**

Date: Tuesday, August 25, 2009

Time: 13:30 - 15:30

Place: Perge

Chair: Pier Paolo Civalleri; *Politecnico di Torino*

**A New Fully Differential Adaptive CMOS Line Driver Suitable for ADSL Applications..... 347**

Ali Dadashi, Khayrollah Hadidi, Abdollah Khoei, *Urmia University*

**Design of High-Speed High-Precision Voltage-Mode MAX-MIN Circuits with Low Area and Low Power Consumption..... 351**

Mohammad Soleimani, Abdollah Khoei, Khayrollah Hadidi, Sarang Kazemini, *Urmia University*

**A New Technique to Achieve Exact and Controllable Voltage Gain Relations in Feedback Amplifiers ..... 355**

Luis Nero Alves, José Luis Cura, *Universidade de Aveiro*

**Differential Power Analysis Attack Considering Decoupling Capacitance Effect..... 359**

Abid Uveys Danis, *Yildiz Technical University & Marmara Research Center*; Siddika Berna Ors, *Istanbul Technical University*

**B2L-C RF Circuits & Models**

Date: Tuesday, August 25, 2009

Time: 13:30 - 15:30

Place: Aspendos

Chair: Nil Tarim; *Istanbul Technical University*

**Measurement-Based Equivalent Circuit Model for Ferrite Beads .....363**

Mikko Hulkkonen, Timo Veijola, *Helsinki University of Technology*; Antti Kallio, *AWR-APLAC*;  
Mikael Andersson, *Nokia Devices*; Martti Valtonen, *Helsinki University of Technology*

**A DRO-Based X-Band Injection-Locked Amplifier without Input Non-Reciprocal Elements .....367**

Enrico Calandra, Daniele Lupo, Lorenzo Puccio, *Palermo University*

**General Measurement-Based Circuit Model for Symmetrical Four-Port RF Transformers .....371**

Antti Kallio, *AWR-APLAC*; Timo Veijola, Janne Roos, *Helsinki University of Technology*; Mikael  
Andersson, *Nokia Devices*; Martti Valtonen, *Helsinki University of Technology*

**Analysis of a Novel BAW-Based Power Amplifier .....375**

Matteo Contaldo, Christian Charles Enz, *Swiss Center for Electronics and Microtechnology*

**GNSScope and the Split Chip Compression Technique.....379**

Renan Kazazoglu, Ediz Cetin, Izzet Kale, *University of Westminster*

**A Novel Topology for the Implementation of Active Distributed Multiplexers .....383**

Homayoon Oraizi, Ebrahim Forati, Mehdi Seyyed Esfahlan, *Iran University of Science &  
Technology*

**B2L-D SPECIAL SESSION: Side Channel & Fault Attacks, Countermeasures**

Date: Tuesday, August 25, 2009

Time: 13:30 - 15:30

Place: Side

Chair: Siddika Berna Örs Yalcin; *Istanbul Technical University*

**A New Fault Attack on the Advanced Encryption Standard Hardware.....387**

Debdeep Mukhopadhyay, *Indian Institute of Technology Kharagpur*

**Empirical Comparison of Side Channel Analysis Distinguishers on DES in Hardware .....391**

Benedikt Gierlichs, Elke De Mulder, Bart Preneel, Ingrid Verbauwhede, *Katholieke Universiteit Leuven & IBBT*

**Differential Power Analysis of AES ASIC Implementations with Various S-box Circuits.....395**

Takeshi Sugawara, Naofumi Homma, Takafumi Aoki, *Tohoku University*; Akashi Satoh, *National Institute of Advanced Industrial Science and Technology*

**Complementary Logics Vs Masked Logics: Which Countermeasure Is a Better Selection?.....399**

Tsutomu Matsumoto, Hidenobu Mimura, Daisuke Suzuki, *Yokohama National University*

**Development of Side-Channel Attack Standard Evaluation Environment .....403**

Toshihiro Katashita, Akashi Satoh, *National Institute of Advanced Industrial Science and Technology*; Takeshi Sugawara, Naofumi Homma, Takafumi Aoki, *Tohoku University*

**Contact-Based Fault Injections and Power Analysis on RFID Tags.....409**

Michael Hutter, Jörn-Marc Schmidt, Thomas Plos, *Graz University of Technology*

**B2L-E Biomedical Circuits & Systems**

Date: Tuesday, August 25, 2009

Time: 13:30 - 15:30

Place: Hadrian

Chair: Wouter Serdijn; *Delft University of Technology*

**ECG Signal Compression Using Wavelet Foveation and SPIHT .....413**

Iulian Ciocoiu, *Technical University Iasi*

**A Nano-Power Class-AB Current Multiplier for Energy-Based Action Potential Detector .....417**

Chutham Sawigun, Wouter Serdijn, *Delft University of Technology*

**Wideband Object Identification with Rectangular Wave Chirp Excitation .....421**

Toivo Paavle, Mart Min, Paul Annus, Andrei Birjukov, Raul Land, Toomas Parve, *Tallinn University of Technology*

**Design Constraints for the Inductive Power and Data Link of an Implanted Body Sensor.....425**

Jens Masuch, Manuel Delgado-Restituto, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*

**Analysis of Local Activity in Reaction-Diffusion Networks: EEG Signals in Epilepsy .....429**

Frank Gollas, *Goethe University Frankfurt am Main*; Ronald Tetzlaff, *Dresden University of Technology*

**Steady-State Visually Evoked EEG Signal Processing with Tuneable Continuous-Time Bandpass Sigma-Delta Modulators .....433**

Sneha Lele, Robert Sobot, Matthew Waxer, Bruce Morton, *University of Western Ontario*

**B3L-B Analog Integrated Circuits III**

Date: Tuesday, August 25, 2009

Time: 16:00 - 17:40

Place: Perge

Chair: Ari Paasio; *University of Turku*

**A Low-Voltage Class-AB Linear Transconductance Based on Floating-Gate MOS Technology .....437**

Ebrahim Farshidi, *Shahid Chamran University of Ahvaz*

**Clocked Semi-Floating-Gate Pseudo Differential Pair for Low-Voltage Analog Design .....441**

Yngvar Berg, Omid Mirmotahari, *University of Oslo*

**Clocked Semi-Floating-Gate Ultra Low-Voltage Current Multiplier .....445**

Yngvar Berg, Omid Mirmotahari, *University of Oslo*



**B3L-C Mixed Signal Circuit & Systems II**

Date: Tuesday, August 25, 2009

Time: 16:00 - 17:40

Place: Aspendos

Chair: Jose L. Huertas; *IMSE, CNM, Spain*

**Analog-Digital Coincidence Mixer.....449**

Milan Stork, Josef Hrusak, Daniel Mayer, *University of West Bohemia*

**A Systematic Approach for Testing a DAC Mismatch Shaping Method.....453**

Marko Neitola, Timo Rahkonen, *University of Oulu*

**Pulse Width Modulation of Multilevel Delta-Sigma Output for Class S Power Amplifier.....457**

Tomasz Podsiadlik, John Dooley, Alan Canniff, Ronan Farrell, *NUI Maynooth*

**High-Performance Coherent Digital Sweep Oscillator Using Piecewise Parabolic Interpolation .....461**

Ashraf Samarah, Otmar Loffeld, *Universität Siegen*

**B3L-D Computational Methods**

Date: Tuesday, August 25, 2009  
Time: 16:00 - 17:40  
Place: Side  
Chair: Timo Veijola; *Helsinki University of Technology*

**A Cooperation Index Based on Correlation Matrix Spectrum and Rényi Entropy .....466**

Marco Righero, *Politecnico di Torino*; Oscar De Feo, *Ecole Polytechnique Fédérale de Lausanne*;  
Mario Biey, *Politecnico di Torino*

**An Analytical Delay Reduction Strategy for Buffer-Inserted Global Interconnects in VDSM Technologies.....470**

Mahmoud Zangeneh, Nasser Masoumi, *University of Tehran*

**Improving Convergence of Algorithms for Solving Systems of Circuit Algebraic-Differential Equations .....476**

Josef Dobes, *Czech Technical University in Prague*; Zdenek Kolka, *Brno University of Technology*

**Krylov-Subspace Based Model Order Reduction for Field-Circuit Coupled Systems .....480**

Mashuqun Nabi, *Indian Institute of Technology Delhi*; Abid Bazaz, *NIT-Srinagar*; Paramita Guha, *Indian Institute of Technology Delhi*

**A Direct Search Method for Finding the Worst Performance Measure in Integrated Circuit Design.....485**

Gregor Cijan, *Regional development agency of Northern Primorska*; Tadej Tuma, Árpád Bűrmen, *University of Ljubljana*

**B4P-F Analog Circuit Design & Signal Processing II**

Date: Tuesday, August 25, 2009  
Time: 10:30 - 11:30  
Place: Poster Area  
Chair: Mircea R. Stan; *U. of Verginia, USA*

**Improved Algorithm for Computing All the DC Operating Points of Diode-Transistor Circuits .....489**  
Michal Tadeusiewicz, Stanislaw Halgas, *Technical University of Lodz*

**Design of a Two-Capacitor Sample & Hold Circuit Using a Two-Stage OTA with Hybrid  
Cascode Compensation.....493**  
Mahmoud Zangeneh, Hossein Aghababa, Behjat Forouzandeh, *University of Tehran*

**A Systematic Design Procedure for CMOS Three-Stage NMC Amplifiers .....499**  
Hossein Shokri Kojori, Mohammad Yavari, *Amirkabir University of Technology-Iran*

**Resistive Networks for Signal and Image Filtering in the Haar Basis .....503**  
Radu Cezar Matei, *Technical University of Iasi*

**Optimizing Power-Area for Constant Input-Referred Noise Level in MOSFETs .....507**  
Iman Madadi, Shahin Jafarabadi Ashtiani, Nasser Masoumi, *University of Tehran*

**Design of CMOS Inverter-Based Output Buffers Adapting the Cherry-Hooper Broadbanding  
Technique.....511**  
Tomoaki Maekawa, Shuhei Amakawa, Noboru Ishihara, Kazuya Masu, *Integrated Research  
Institute, Tokyo Institute of Technology*

**B5P-F Modeling & Design**

Date: Tuesday, August 25, 2009

Time: 14:00 - 15:00

Place: Poster Area

Chair: Ricardo Carmona-Galán; *Instituto de Microelectrónica de Sevilla*

**High-Speed Low-Complexity Three-Parallel Reed-Solomon Decoder for 6-Gbps mmWave WPAN Systems ..... 515**

Chang-Seok Choi, Hanho Lee, *Inha University*

**Vertical and Horizontal Magnetic Force Sensor and Application of Sensor in Power Devices ..... 519**

Martin Donoval, Martin Daricek, Juraj Marek, Viera Stopjakova, *Slovak University of Technology in Bratislava*

**Low Power High Performance Keeper Technique for High Fan-in Dynamic Gates ..... 523**

Farhad Haj Ali Asgari, Majid Ahmadi, Jonathan Wu, *University of Windsor*

**Mixed-Mode Behavioral Model of Flexray Physical Layer Transceiver ..... 527**

Candice Muller, Maurizio Valle, *University of Genoa*; Roman Buzas, Augustin Skoupy, *On Semiconductors Corporation*

**Partitioning-Based Second-Order Model-Order Reduction Method for RC Circuits ..... 531**

Pekka Miettinen, Mikko Honkala, Janne Roos, Martti Valtonen, *Helsinki University of Technology*

**B6P-F Nonlinear Circuits & Systems**

Date: Tuesday, August 25, 2009  
Time: 16:00 - 17:00  
Place: Poster Area  
Chair: Muhammet Koksai; *Fatih University*

**Particle Filter Applied to Polynomial Chaotic Maps ..... 535**

Moussa Yahia, Pascal Acco, *INSA-University of Toulouse*

**A New Modified Asymmetric Bridge Drive Circuit Switched Reluctance Motor ..... 539**

Majid Asgar, *Shahid Beheshti University*; Ebrahim Afjei, *Islamic Azad University-Science and Research Branch*; Alireza Siadatan, Ali Zakerolhosseini, *Shahid Beheshti University*

**A Method for Searching the Limit Cycles of High Order Sigma-Delta Modulators ..... 543**

Valeri Mladenov, *Technical University of Sofia*

**Programmable Non-Linearity for STAR Cellular Neural Networks ..... 547**

Fausto Sargeni, Vincenzo Bonaiuto, *University of Rome Tor Vergata*

**Comparison Between Chua-Yang and Hyperbolic CNNs ..... 551**

Mireia Vinyoles-Serra, Xavier Vilasís-Cardona, *La Salle - Universitat Ramon LLull*

**Multidimensional Search Space for Catastrophic Faults Diagnosis in Analog Electronic Circuits ..... 555**

Piotr Kyziol, Damian Grzechca, Jerzy Rutkowski, *Silesian University of Technology*

**Implementation of Partial Synchronization of Different Chaotic Systems by Field Programmable Gate Array ..... 559**

Can Eroglu, Ferit Acar Savaci, *Izmir Institute of Technology*

**Implementation of Biologically Plausible Spiking Neural Network Models on the Memristor Crossbar-Based CMOS/Nano Circuits ..... 563**

Ahmad Afifi, A Ayatollahi, *Iran University of Science & Technology*; F Raissi, *Khaje Nasir Toosi University of Technology*

**C1L-A Nonlinear Systems I**

Date: Thursday, August 27, 2009  
Time: 10:30 - 12:10  
Place: Attaleia  
Chair: Zbigniew Galias;

**Absolute Stability of 2nd Order Discrete-Time Single Variable Lur'e Systems .....567**

Roisin Duignan, Paul Curran, *University College Dublin*

**Analysis of Periodic Solutions of Discretized Single Input Sliding Mode Control Systems .....571**

Zbigniew Galias, *AGH University of Science and Technology*

**Early Consensus in Complex Networks Under Variable Graph Topology .....575**

Leonidas Georgopoulos, Martin Hasler, *Ecole Polytechnique Fédérale de Lausanne*

**Two Time-Scale Approach Implemented on Hybrid Equations .....579**

Mihai Iordache, Lucia Dumitriu, *Politehnica University of Bucharest*; Lucian Mandache, *University of Craiova*

**On the Synthesis of Periodic Signals by Discrete Pulse-Trains and Optimisation Techniques .....584**

Federico Bizzarri, Sergio Callegari, Riccardo Rovatti, *University of Bologna*; Gianluca Setti, *University of Ferrara*

## **C1L-B Oscillators & Filters**

Date: Thursday, August 27, 2009

Time: 10:30 - 12:10

Place: Perge

Chair: Antonio Buonomo; *Seconda Università degli Studi di Napoli*

### **A Low Frequency Oscillator Structure .....588**

Ahmed Elwakil, *University of Sharjah*; Serdar Ozoguz, *Istanbul Technical University*

### **A Novel Method for Analysis and Design of Third-Order Charge Pump PLL .....591**

Habib Adrang, Hossein Miare Naeimi, *Babol University of Technology*

### **Noise and Dynamic Range of CMOS Degenerated Active Inductor Resonators .....595**

Grzegorz Szczepkowski, Ronan Farrell, *National University of Ireland, Maynooth*

### **A Performance Comparison of Dickson and Fibonacci Charge Pumps .....599**

Younis Allasasmeh, Stefano Gregori, *University of Guelph*

### **Low-Sensitivity Design and Implementation of Allpass Based Fractional Delay Digital Filters .....603**

Kamelia Nikolova, Georgi Stoyanov, *Technical University of Sofia*; Masayuki Kawamata, *Tohoku University*

**C1L-C Computational Tools**

Date: Thursday, August 27, 2009  
Time: 10:30 - 12:10  
Place: Aspendos  
Chair: Branimir Reljin; *University of Belgrade*

**Frequency/Time Block Preconditioners for Harmonic Balance Jacobians ..... 607**

Mikko Honkala, *Helsinki University of Technology*; Ville Karanko, *AWR-APLAC Corporation*; Janne Roos, Martti Valtonen, *Helsinki University of Technology*

**A Fuzzy Selection Based Constraint Handling Method for Multi-Objective Optimization of Analog Cells ..... 611**

Bo Liu, *Katholieke Universiteit Leuven*; Francisco Fernández, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*; Peng Gao, Georges Gielen, *Katholieke Universiteit Leuven*

**Enhanced Multivariate Steady-State Time-Domain Method ..... 615**

Tuukka Tuomisto, Anu Lehtovuori, Jarmo Virtanen, Janne Roos, Mikko Honkala, Martti Valtonen, *Helsinki University of Technology*

**A Generic Reconfigurable Array Specification and Programming Environment (GRASPER) ..... 619**

Faik Baskaya, David Anderson, Paul Hasler, Sung Kyu Lim, *Georgia Institute of Technology*



**C1L-D Mixed Signal Circuit & Systems III**

Date: Thursday, August 27, 2009  
Time: 10:30 - 12:10  
Place: Side  
Chair: Avni Morgul; *Beykent University, Turkey*

**A New High Speed, Low Power Adder: Using Hybrid Analog-Digital Circuits ..... 623**  
*Nima Taherinejad, Adib Abrishamifar, Iran University of Science & Technology*

**Calculation of Cycle Lengths in MASH 1-2-2 Digital Delta Sigma Modulators with a Constant Input ..... 627**  
*Kieran O'Neill, Brian Fitzgibbon, University College Cork; Kaveh Hosseini, Michael Peter Kennedy, University College Cork and Tyndall Institute*

**Mitigation of the Sampling and Substrate Noise Induced Distortion in Regenerative Comparators by Adaptive Interpolation ..... 631**  
*Athanasios Stefanou, Georges Gielen, Katholieke Universiteit Leuven*

**A High-Speed Swing Reduced Driver Suitable for Current-Steering Digital-to-Analog Converters ..... 635**  
*Indrit Myderrizi, Dogus University/Istanbul Technical University; Ali Zeki, Istanbul Technical University*

**Design of Stepped-Impedance Low Pass Filters with Impedance Matching by the Particle Swarm Optimization and Conjugate Gradient Method ..... 639**  
*Homayoon Oraizi, Mehdi Seyyed Esfahlan, Ebrahim Forati, Iran University of Science & Technology*

**C1L-E Fault Diagnosis**

Date: Thursday, August 27, 2009

Time: 10:30 - 12:10

Place: Hadrian

Chair: Michal Tadeusiewicz; *Technical University of Lodz*

**SAT-Based ATPG Testing of Inter- and Intra-Gate Bridging Faults.....643**

Toru Nakura, Yutaro Tatemura, *University of Tokyo*; Gorschwin Fey, *University of Bremen*; Makoto Ikeda, Satoshi Komatsu, Kunihiko Asada, *University of Tokyo*

**Multiple Catastrophic Fault Diagnosis of Linear Circuits Considering the Component Tolerances.....647**

Michal Tadeusiewicz, Stanislaw Halgas, *Technical University of Lodz*

**A Global Parametric Faults Diagnosis with the Use of Artificial Neural Networks .....651**

Piotr Jantos, Damian Grzechca, Jerzy Rutkowski, *Silesian University of Technology*

**Specialised Aperiodic Excitation and Wavelet Transform Improves Analogue Fault Diagnosis .....655**

Lukas Chruszczyk, Jerzy Rutkowski, *Technical University of Silesia*

**Faults Classification in Analog Electronic Circuits with Use of the SVM Algorithm .....659**

Damian Grzechca, Slawomir Czeczotka, *Silesian University of Technology*

## **C2L-A Nonlinear Circuits**

Date: Thursday, August 27, 2009

Time: 13:30 - 15:10

Place: Attaleia

Chair: Orla Feely; *University College Dublin*

### **Autonomous Third-Order Duffing-Holmes Type Chaotic Oscillator.....663**

Erik Lindberg, *Technical University of Denmark*; Elena Tamaseviciute, *Vilnius University*; Gytis Mykolaitis, *Vilnius Gediminas Technical University*; Skaidra Bumeliene, Tatjana Pyragiene, *Semiconductor Physics Institute*; Raimundas Kirvaitis, *Vilnius Gediminas Technical University*; Arunas Tamasevicius, *Semiconductor Physics Institute*

### **Experimental Study of an Interrupted Electric Circuit with Spike Noise.....667**

Hiroyuki Asahara, Takuji Kousaka, *Oita University*

### **Propagation Mechanism of Phase-Inversion Wave in 2D Lattice Oscillators and Their Application to Prediction of Time-Series Data.....671**

Hitoshi Aburatani, Suguru Yamane, *Hiroshima Institute of Technology*; Takeo Imoto, Masayuki Yamauchi, *Institute of Technology*; Yoshifumi Nishio, *Tokushima University*

### **Design and Analysis of a Low-Power Highly Linear Mixer.....675**

Jiming Jiang, David Holburn, *University of Cambridge*

### **Analyses of Motion and Acceleration Sensors Using Printed Spiral Inductors by a Simulator and Actual Circuit Experiments .....679**

Kazuhisa Yoshimatsu, Masayuki Yamauchi, *Hiroshima Institute of Technology*; Mamoru Tanaka, *Sophia University*

**C2L-B Analog Filters & Amplifiers**

Date: Thursday, August 27, 2009

Time: 13:30 - 15:10

Place: Perge

Chair: Martti Valtonen; *Helsinki University of Technology Finland*

**Accurate Design of a MOS-Based Resistive Network for Time-Controlled Diffusion Filtering..... 683**

Jorge Fernández-Berni, Ricardo Carmona-Galán, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*

**Filter Approximation Problem Using DE Algorithms ..... 687**

Pravoslav Martinek, Petr Boreš, *Czech Technical University in Prague*; Daša Tichá, *University of Zilina*

**A Novel Wideband-High-CMRR Low-Voltage Bjt Current Output Stage ..... 691**

Mohammad Hekmat Kashtiban, Seyed Javad Azhari, *Iran University of Science & Technology*

**Class-AB Rail-to-Rail CMOS Buffer with Bulk-Driven Super Source Followers ..... 695**

Yasutaka Haga, Izzet Kale, *University of Westminster*

**A New Second-Order Multi-Mode Multi-Funtion Filter Using a Single CDBA ..... 699**

Muhammet Koksall, *Fatih University*; Sukru Eser Oner, *Teknobil INC*; Mehmet Sagbas, *Maltepe University*

**C2L-C CAD for IC**

Date: Thursday, August 27, 2009

Time: 13:30 - 15:10

Place: Aspendos

Chair: Gerd Vandersteen; *Vrije Universiteit Brussel*

**A New Power Grid Optimization Algorithm Based on Manufacturing Cost Restriction ..... 703**

Takayuki Hayashi, Masahiro Fukui, *Ritsumeikan University*; Shuji Tsukiyama, *Chuo University*

**Accuracy of the Criticality Probabilty of a Path in Statistical Timing Analysis ..... 707**

Shuji Tsukiyama, *Chuo University*; Masahiro Fukui, *Ritsumeikan University*

**Multicore Thermal Management with Model Predictive Control ..... 711**

Francesco Zanini, David Atienza, *Ecole Polytechnique Fédérale de Lausanne*; Luca Benini, *University of Bologna*; Giovanni De Micheli, *Ecole Polytechnique Fédérale de Lausanne*

**A Study of CMOS Radiation Tolerant Transistors Using Green Functions ..... 715**

Paula Lopez, Beatriz Blanco Filgueira, Diego Cabello, *University of Santiago de Compostela*;  
Johann Hauer, *Fraunhofer Institute for Integrated Circuits*

**C2L-D Communication Circuits**

Date: Thursday, August 27, 2009  
Time: 13:30 - 15:10  
Place: Side  
Chair: Sergio Callegari; *University of Bologna*

**Power Efficient Polyphase Comb Decimation Filters for Sigma Delta Modulators in Multi-Rate Digital Receivers.....719**

Noha Younis, Mahmoud Ashour, *Microelectronics Design Center*, Amin Nassar, *Cairo university*

**A Spur-Free MASH Digital Delta-Sigma Modulator with Higher Order Shaped Dither.....723**

Brian Fitzgibbon, Kieran O'Neill, Andrew Grannell, Ciaran Horgan, *University College Cork*; Zhipeng Ye, *Australian Semiconductor Technology Company*; Kaveh Hosseini, Michael Peter Kennedy, *University College Cork*

**Quadrature Modulator Model with Third-Order Non-Linearities .....727**

Esa Tiiliharju, *University of Turku*

**An Accurate and Efficient Method for BER Analysis in High-Speed Communication Systems .....731**

Stefan Erb, Wolfgang Pribyl, *Graz University of Technology*

**An S Band RF Digital Linearizer for TWTAs and SSPAs .....735**

Fadhel M. Ghannouchi, *University of Calgary*

**C2L-E SPECIAL SESSION: New Trends in A/D Converters Design & Testing II**

Date: Thursday, August 27, 2009

Time: 13:30 - 15:10

Place: Hadrian

Chair: Jose L. Huertas; *IMSE, CNM, Spain*

**Multi-Bit High-Order Incremental Converters with Digital Calibration ..... 739**

Andrea Agnes, Franco Maloberti, *University of Pavia*

**A New Scheme for DC Offset Compensation and its Application to Current Mode and Voltage Mode D/A Converters ..... 743**

Swathi Marri, Jaime Ramirez-Angulo, *New Mexico State University*; Antonio Lopez Martin, *Public University of Navarra*; Ramon Carvajal, *University of Seville*

**A Multi-Converter DFT Technique for Complex Sip: Concepts and Validation ..... 747**

Vincent Kerzérho, Philippe Cauvet, *Philips Global*; Serge Bernard, Florence Azais, Mariane Comte, Michel Renovell, *Le Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier*

**Design of a 1-V Operational Passive Sigma-Delta Modulator ..... 751**

Toru Sai, Yasuhiro Sugimoto, *Chuo University*

**C3L-A SPECIAL SESSION: Advances in AMS/RF Design Methods**

Date: Thursday, August 27, 2009  
Time: 15:40 - 17:40  
Place: Attaleia  
Chair: Gunhan Dundar; *Bogazici University*  
Francisco V. Fernandez; *IMSE, CSIC and U. Sevilla*

**Hierarchical Synthesis Based on Pareto-Optimal Fronts ..... 755**

Elisenda Roca, Rafael Castro-Lopez, Francisco Fernandez, *Instituto de Microelectrónica de Sevilla, Centro Nacional de Microelectrónica, University of Sevilla*

**Qualification and Quantification of the Nonlinear Distortions in Discrete-Time Sigma-Delta ADCs ..... 759**

Gerd Vandersteen, Ludwig De Locht, *Vrije Universiteit Brussel*

**Towards Automated Extraction of Emc-Aware Trajectory-Based Macromodels for Analog Circuits ..... 763**

Georges Gielen, Dimitri De Jonghe, Johan Loeckx, *Katholieke Universiteit Leuven*

**Online AMS Frontend Reconfiguration for Sensor Network Applications ..... 767**

Pengbo Sun, Cristian Ferent, Michael Gilberti, Alex Doboli, *State University of New York at Stony Brook*

**A Free-Shape Router for Analog and RF Applications ..... 771**

Engin Avci, Martin Strasser, Helmut Graeb, Ulf Schlichtmann, *Technische Universität München*

**Enhancing Analog IC Design Optimization Kernels with Simple Fuzzy Models ..... 775**

Pedro Sousa, Carla Duarte, Manuel Barros, Jorge Guilherme, Nuno Horta, *Instituto de Telecomunicações / Instituto Superior Técnico*



**C3L-C VLSI Modeling & Design**

Date: Thursday, August 27, 2009  
Time: 15:40 - 17:40  
Place: Aspendos  
Chair: Gaetano Palumbo; *University of Catania*

**Correct Procedures to Evaluate the Effect of Intradie Variations on the Delay Variability of Digital Circuits ..... 779**

Massimo Alioto, *University of Siena*; Elio Consoli, Gaetano Palumbo, Melita Pennisi, *University of Catania*

**A Parametric Macromodelling Technique ..... 783**

Marissa Condon, Georgi Grahovski, *Dublin City University*

**Electromigration-Aware Design ..... 786**

Mircea Stan, Paolo Re, *University of Virginia*

**An Application Specific Circuits Design for a LVCSR System ..... 790**

Akihiko Eguchi, Kazuya Kishida, Takashi Kambe, *Kinki University*; Makoto Saituji, *NEC Electronics Corp*

**Crosstalk Reduction in Printed Circuit Boards Using Irregularly-Spaced Vias in a Guard Trace Over a Slotted Ground Plane ..... 794**

Ung Choi, Yoonjung Kim, Youngsoo Kim, *Pohang University of Science and Technology*

**Implementation of a Visible Watermarking in a Secure Still Digital Camera Using VLSI Design ..... 798**

Chinnasamy Ramesh, Mohamed Ismail Majeed, *PSN College of Engineering and Technology*

**C3L-D Audio & Image Processing**

Date: Thursday, August 27, 2009  
Time: 15:40 - 17:40  
Place: Side  
Chair: Norikazu Takahashi; *Kyushu University*

**Regional Image Correspondence Matching Method for SIMD Processing ..... 802**  
Olli Lahdenoja, Mika Laiho, *University of Turku*

**On the Use of Memory for Detecting Musical Notes in Polyphonic Piano Music..... 806**  
Giovanni Costantini, Massimiliano Todisco, *University of Rome Tor Vergata*; Renzo Perfetti,  
*University of Perugia*

**Sub-Band Adaptive Filtering for Acoustic Echo Cancellation ..... 810**  
Irina Dornean, Marina Dana Topa, Botond Sandor Kirei, Marius Neag, *Technical University of Cluj-Napoca*

**On Clustering Coefficients of Graphs with the Fixed Numbers of Vertices and Edges ..... 814**  
Norikazu Takahashi, *Kyushu University*

**Highly Reliable Harmony Search Algorithm ..... 818**  
Nima Taherinejad, *Iran University of Science & Technology*

**C3L-E SPECIAL SESSION: Emulated Digital CNN Based Computing on Different Array Processors**

Date: Thursday, August 27, 2009  
Time: 15:40 - 17:40  
Place: Hadrian  
Chair: Peter Szolgay; *Hungarian Academy of Sciences*

**Implementation of a Parallel SAD Based Wavefront Sensor Architecture on FPGA .....823**

Zoltán Kincses, *University of Pannonia*; Zoltán Nagy, László Orzó, Péter Szolgay, *Computer and Automation research Institute of the Hungarian Academy of Sciences*; György Mező, *Heliophysical Observatory Debrecen*

**Computational Fluid Flow Simulation on Body Fitted Mesh Geometry with IBM Cell Broadband Engine Architecture.....827**

Zoltán Nagy, *Computer and Automation research Institute of the Hungarian Academy of Sciences*; András Kiss, *Pázmány Péter Catholic University*; Sándor Kocsárdi, *University of Pannonia*; Árpád Csík, *Széchenyi István University*

**An Emulated Digital Wave Computer Core Implementation.....831**

Ramazan Yeniceri, Mustak Erhan Yalcin, *Istanbul Technical University*

**A Digital Cellular-Based System for Retinal Vessel-Tree Extraction.....835**

César Díaz Resco, Alejandro Nieto, Roberto R. Osorio, Victor Manuel Brea, David López Vilariño, *University of Santiago de Compostela*

**An Efficient FPGA Implementation of a DT-CNN for Small Image Gray-Scale Pre-Processing .....839**

Jordi Albó Canals, Jose Angel Villasante Bembibre, Jordi Riera Baburés, *La Salle - Universitat Ramon LLull*; Natalia A. Fernández García, Victor M. Brea, *University of Santiago de Compostela*

**CNN Model on Stream Processing Platform .....843**

László Füredi, *Pázmány Péter Catholic University*; Péter Szolgay, *Computer and Automation research Institute of the Hungarian Academy of Sciences*

## **C4P-F Computational Methods & Tools**

Date: Thursday, August 27, 2009  
Time: 10:30 - 11:30  
Place: Poster Area  
Chair: Seiichiro Moro; *University of Fukui*

### **Insufficiency in Finite Difference Solution of Cylindrical Time Varying Magnetic Problems.....847**

Mohammad Saeed Afjei, *Islamic Azad University-Science and Research Branch*; Ebrahm Afjei, H Shokri, H Babae, *Shahid Beheshti University*

### **Self-Tuning Approach to Optimization of Excitation Angles for Switched-Reluctance Motor Drives.....851**

S.A. Fatemi, *Shahid Beheshti University*; H Moradi Cheshmehbeigi, *Islamic Azad University-Pardis Branch*; Ebrahim Afjei, *Shahid Beheshti University*

### **Design and Analysis of Low Torque Ripple Switched Reluctance Motor Using 3-Dimensional Finite Element Method .....857**

H Moradi Cheshmehbeigi, *Islamic Azad University-Pardis Branch*; Sajad Yari, *Islamic Azad University-Science and Research Branch*; Ebrahim Afjei, *Shahid Beheshti University*

### **Evaluation of Hilbert Space Techniques and Lagrange's Method for the Analysis of Dissipated Power in DC Circuits .....862**

Horia Andrei, *Valahia University of Targoviste*; Fanica Spinei, Paul Andrei, *Politehnica University of Bucharest*; Ulrich Rohde, *Technical University of Cottbus*; Marius Silaghi, Helga Silaghi, *University of Oradea*

### **Development of a Toolbox for Frequency Response Analysis of Fractional Order Control Systems .....866**

Celaleddin Yeroglu, Nusret Tan, *Inonu University*

### **Converting a Set Into a Minimum-Phase Sequence .....870**

Corneliu Rusu, *Technical University of Cluj-Napoca*; Jaakko Astola, *Tampere International Center for Signal Processing*

### **Energy-Efficient, High-Performance Viterbi ACS Unit Implementation in 90nm CMOS .....874**

Ying Zhang, Taskin Kocak, *University of Bristol*

**C5P-F Nonlinear & Microwave Circuits**

Date: Thursday, August 27, 2009  
Time: 13:30 - 14:30  
Place: Poster Area  
Chair: Piotr Dudek; *University of Manchester*

**A Low Power Ultra-Wideband CMOS LNA with Inter Stage Technique.....878**  
Ehsan Kargaran, *Sadjad Institute for Higher Education*; Hamed Kargaran, *Shiraz University*

**A Single-Electron Bandpass Digital Wave Filter .....882**  
Takashi Yasuno, Yoshinao Suzuki, Hisato Fujisaka, Takeshi Kamio, Chang-Jun Ahn, Kazuhisa Haeiwa, *Hiroshima City University*

**Ising Spin-Grass Error Correction for Unreliable Nanoelectronic Logic Circuits .....886**  
Yasuhiro Okada, Hisato Fujisaka, Takeshi Kamio, Chang-Jun Ahn, Kazuhisa Haeiwa, *Hiroshima City University*

**Theoretical Analysis and Characterization of the Tunable Matching Networks in Low Noise Amplifiers .....890**  
Mustafa Berke Yelten, Kevin G. Gard, *North Carolina State University*

**New Design of RF MEMS Disk Resonators and Optimization for Spurious Modes .....894**  
Masoud Baghelani, Habib Badri Ghavifekr, *Sahand University of Technology*

**A Noise Shaped Flash Time to Digital Converter for All Digital Frequency Synthesizers.....898**  
Masoud Ensafdaran, Mojtaba Atarodi, *Sharif University of Technology*

**Brayton - Moser's Equations of Transmission Line Circuits and Their Complete Stability .....902**  
Hideaki Okazaki, Hideo Nakano, *Shonan Institute of Technology*

**Author Index**