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ISCAS Table of Contents

Expand the bookmarks and navigate to the desired **Date** and/or **Session Name**. Scroll to the desired paper and select a **Blue** title link to open the paper. After viewing, use the bookmarks to return to the Table of Contents or another section.

A1L-A: Analog to Digital Converters I
Time: Monday, May 16, 2011, 10:30 - 12:10
Room: ALHAMBRA I
Chair: Albert Wang, *Regents of the University of California*

A1L-A.1 **A 6-Bit 1.3-GS/s Flash ADC Using a Gain-Compensated Tha and an Offset-Averaging Preamplifier Array ..... NA**
Yong Chen[2], Pui-In Mak[3], Yumei Zhou[1], Hao Ju[1], Li Zhang[2], He Qian[2], Yan Wang[2], Zhiping Yu[2]
[1]Institute of Microelectronics, Chinese Academy of Sciences, China; [2]Tsinghua University, China; [3]University of Macau, China

A1L-A.2 **Nyquist-Rate Time-Interleaved Current-Steering DAC with Dynamic Channel Matching 5**
Long Cheng, Fan Ye, Hai-Feng Yang, Ning Li, Jun Xu, Junyan Ren
Fudan University, China

A1L-A.3 **A 2.5GS/s 3-Bit Time-Based ADC in 90nm CMOS 9**
Andrew Macpherson, Kenneth Townsend, James Haslett
University of Calgary, Canada

A1L-A.4 **An Ultra-Low-Power SAR ADC with an Area-Efficient DAC Architecture 13**
Pouya Kamalinejad, Shahriar Mirabbasi, Victor C.M. Leung
University of British Columbia, Canada

A1L-B: Amplifiers

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: ALHAMBRA II
Chair: Hoi Lee, *University of Texas at Dallas*

A1L-B.1 **11 GHz UGBW Op-Amp with Feed-Forward Compensation Technique 17**
Hitesh Shrimali, Shouri Chatterjee
Indian Institute of Technology, Delhi, India

A1L-B.2 **A 15.5 dB, Wide Signal Swing, Dynamic Amplifier Using a Common-Mode Voltage Detection Technique 21**
James Lin, Masaya Miyahara, Akira Matsuzawa
Tokyo Institute of Technology, Japan

A1L-B.3 **A Current-Mirror Opamp with Switchable Transconductances for Low-Power Switched-Capacitor Integrators ..... NA**
Mostafa Haroun, Anas Hamoui
McGill University, Canada

A1L-B.4 **Self-Biased Dual-Path Push-Pull Output Buffer Amplifier Topology for LCD Driver Applications 29**
Davide Marano, Gaetano Palumbo, Salvatore Pennisi
Università degli Studi di Catania, Italy

A1L-B.5 **A High-Voltage-Enabled Recycling Folded Cascode OpAmp for Nanoscale CMOS Technologies 33**
Miao Liu, Pui-In Mak, Zushu Yan, Rui Martins
University of Macau, China

A1L-C: Low-Dropout Regulator

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: EL PARDO I
Chair: Gabriel Rincón-Mora, *Georgia Institute of Technology*

A1L-C.1 **A Quiescent Power-Aware Low-Voltage Output Capacitorless Low Dropout Regulator for SoC Applications 37**
Sau Siong Chong, Pak Kwong Chan
Nanyang Technological University, Singapore

A1L-C.2 **A Versatile Low-Dropout Voltage Regulator for Automotive Applications 41**
Stefano Pietri, Chris Dao, Jehoda Refaeli, Alfredo Olmos, Xiaolei Wu
Freescale Semiconductor, China

A1L-C.3 **An Output-Capacitor-Free Adaptively Biased Low-Dropout Regulator with Sub-Threshold Undershoot-Reduction for SoC 45**
Chenchang Zhan, Wing-Hung Ki
Hong Kong University of Science and Technology, Hong Kong

A1L-C.4 **A Low Power High Speed Envelope Detector for Serial Data Systems in 45nm CMOS..... 49**
Sumantra Seth, Rajavelu Thinakaran, Sujoy Chakravarty, Vikas Sinha
Texas Instruments, India, India

A1L-C.5 **Design Optimization of an Output Capacitor-Less Low Dropout Regulator with Compensation Capcitance Reduction and Slew-Rate Enhancement Technique 53**
Edward N. Y. Ho, Philip K. T. Mok
Hong Kong University of Science and Technology, Hong Kong

A1L-D: Memory Circuits I

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: EL PARDO II
Chair(s): Kwen-Siong Chong, *Nanyang Technological University*
Volkan Kursun, *The Hong Kong University of Science and Technology*

A1L-D.1 **A Dense 45nm Half-Differential SRAM with Lower Minimum Operating Voltage.....57**
Gregory Chen, Michael Wieckowski, Daeyeon Kim, David Blaauw, Dennis Sylvester
University of Michigan, United States

A1L-D.2 **A Subthreshold Dynamic Read SRAM (DRSRAM) Based on Dynamic Stability Criteria.....61**
Roghayeh Saeidi, Mohammad Sharifkhani, Khosro Hajsadeghi
Sharif University of Technology, Iran

A1L-D.3 **A Novel Technique to Measure Data Retention Voltage of Large SRAM Arrays 65**
Farah Yahya, Mohammad Mansour, Ali Chehab
American University of Beirut, Lebanon

A1L-D.4 **A 1.85fW/Bit Ultra Low Leakage 10T SRAM with Speed Compensation Scheme 69**
Daeyeon Kim, Gregory Chen, Matthew Fojtik, Mingoo Seok, David Blaauw, Dennis Sylvester
University of Michigan, United States

A1L-D.5 **Efficient Voltage Conversion for SRAM Low Standby Power Modes 73**
Lawrence Clark, Tai-Hua Chen, Vikas Chaudhary
Arizona State University, United States

A1L-E: Life Science Systems & Applications

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: ORIENTE
Chair: Pau-Choo Julia Chung, *National Cheng Kung University*

A1L-E.1 **Simplified Logic Design Methodology for Fuzzy Membership Function Based Robust Detection of Maternal Modulus Maxima Location 77**
Amit Acharyya[2], Koushik Maharatna[2], Bashir M Al-Hashimi[2], Hasitha Tudugalle[1]
[1]SAAB Seaeye Ltd, Fareham, UK, United Kingdom; [2]University of Southampton, United Kingdom

A1L-E.2 **A Pseudo-Online Brain-Computer Interface with Automatic Choice for EEG Channel and Frequency 81**
Alessandro Benevides, Teodiano Bastos, Mário Sarcinelli Filho
Universidade Federal do Espírito Santo, Brazil

A1L-E.3 **Rapid Prototyping of the Goertzel Algorithm for Hardware Acceleration of Exon Prediction 85**
Michel Voyer, Sylvain-Robert Rivard, Luc Morin, Hung Tien Bui
Université du Québec à Chicoutimi, Canada

A1L-E.4 **Noise Reduction Filters Based on Pointwise Map for CT Images 89**
Rafael Geraldo, Nelson Mascarenhas
Universidade Federal de São Carlos, Brazil

A1L-E.5 **Image Registration Method for 2D Representation of Wireless Micro-Ball Endoscopic Images 93**
Dan Wang, Xiang Xie, Guolin Li, Yingke Gu, Tianjia Sun, Zhihua Wang
Tsinghua University, China

A1L-F: Image & Video Coding

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: IMPERIAL I
Chair(s): Oscar C. Au, *Hong Kong University of Science & Technology*
Shipeng Li, *Microsoft Research Asia*

A1L-F.1 **Perceptual Image Compression via Adaptive Block-Based Super-Resolution Directed Down-Sampling 97**
Lin Ma, Songnan Li, King Ngi Ngan
Chinese University of Hong Kong, Hong Kong

A1L-F.2 **Browser-Friendly Hybrid Codec for Compound Image Compression 101**
Zhaotai Pan[2], Huifeng Shen[1], Yan Lu[1], Shipeng Li[1]
[1]Microsoft Research Asia, China; [2]University of Science and Technology of China, China

A1L-F.3 **Highly Parallel Image Coding for Many Cores 105**
Xiulian Peng[2], Jizheng Xu[1], Feng Wu[1]
[1]Microsoft Research Asia, China; [2]University of Science and Technology of China & Microsoft Research Asia, China

A1L-F.4 **Efficient Dictionary Based Video Coding with Reduced Side Information 109**
Je-Won Kang[2], C.-C. Jay Kuo[2], Robert Cohen[1], Anthony Vetro[1]
[1]Mitsubishi Electric Research Lab, United States; [2]University of southern california, United States

A1L-F.5 **Multiple Sub-Pixel Interpolation Filters with Adaptive Symmetry for High-Resolution Video Coding 113**
Run Cha, Oscar Au, Xingyu Zhang, Xing Wen, Jiali Li
Hong Kong University of Science and Technology, Hong Kong

A1L-G: Adaptive Techniques in Signal and Image Processing Applications

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: ALVORADA I
Chair(s): Moncef Gabbouj, *Tampere University of Technology*
Akira Taguchi, *Tokyo City University*

A1L-G.1 **A New Switch-Mode Noise-Constrained Transform Domain NLMS Adaptive Filtering Algorithm 117**
Shing-Chow Chan[2], Yijing Chu[2], K. M. Tsui[1], Zhiguo Zhang[1]
[1]Univeristy of Hong Kong, China; [2]University of Hong Kong, China

A1L-G.2 **A High-Speed FIR Adaptive Filter Architecture Using a Modified Delayed LMS Algorithm 121**
Pramod Kumar Meher[1], Megha Maheshwari[2]
[1]Institute for Infocomm Research, A-STAR, Singapore; [2]Nanyang Technological University, Singapore

A1L-G.3 **An Adaptive Approach for Contextual Audio Denoising Using Local Fisher Information 125**
Alexandre Levada[2], Débora Corrêa[1]
[1]Universidade de São Paulo, Brazil; [2]Universidade Federal de São Carlos, Brazil

A1L-G.4 **Enhanced Adaptive Playout Scheduling and Loss Concealment Techniques for Voice over IP Networks 129**
Dinei Florencio, Li-Wei He
Microsoft Research, United States

A1L-G.5 **A New Low Complexity Iterative Equalization Architecture for High-Speed Receivers on Highly Dispersive Channels: Decision Feedforward Equalizer (DFFE) 133**
Ariel Luis Pola[2], Diego Ernesto Crivelli[2], Juan Edmundo Cousseau[4], Oscar Ernesto Agazzi[1], Mario Rafael Hueda[3]
[1]ClariPhy Communications Inc., Argentina; [2]National University of Cordoba, Argentina; [3]Universidad Nacional de Córdoba, Argentina; [4]Universidad Nacional del Sur, Argentina

A1L-H: FIR Digital Filters

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: ALVORADA II
Chair(s): Yong Lian, *National University of Singapore*
Yu Yajun, *National University of Singapore*

A1L-H.1 **A MATLAB Based Optimum Multibands FIR Filters Design Program Following the Original Idea of the Remez Multiple Exchange Algorithm 137**
Muhammad Ahsan, Tapio Saramäki
Tampere University of Technology, Finland

A1L-H.2 **Design of Variable Bandedge FIR Filters with Extremely Large Bandedge Variation Range 141**
Ya Jun Yu
Nanyang Technological University, Singapore

A1L-H.3 **Switching Activity Analysis and Power Estimation for Multiple Constant Multiplier Block of FIR Filters 145**
Wenbin Ye, Ya Jun Yu
Nanyang Technological University, Singapore

A1L-H.4 **Successive Approximation FIR Filter Design 149**
Alessandro Dutra[2], Lisandro Lovisolo[1], Eduardo Da Silva[2], Paulo Diniz[2]
[1]Universidade do Estado do Rio de Janeiro, Brazil; [2]Universidade Federal do Rio de Janeiro, Brazil

A1L-J: Digitally Intensive Frequency Synthesis Architectures for the Nano-Scale – Part I

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: ITAMARATY I
Chair(s): Franco Maloberti, *University of Pavia*
Paul Sotiriadis, *Sotekco LLC*

A1L-J.1 **Multi-Clock Domain Analysis and Modeling of All-Digital Frequency Synthesizers 153**
Ioannis Syllaios, Poras Balsara
University of Texas at Dallas, United States

A1L-J.2 **MEMS-Based All-Digital Frequency Synthesis for Ultralow-Power Radio for WBAN and WSN Applications 157**
David Ruffieux, Matteo Contaldo, Christian Enz
CSEM SA, Switzerland

A1L-J.3 **First Order Noise Shaping in All Digital PLLs 161**
Francesco Brandonisio, Michael Peter Kennedy
University College Cork and Tyndall National Institute, Ireland

A1L-J.4 **Jitter-Power Minimization of Digital Frequency Synthesis Architectures 165**
Eric Klumperink[2], Ramen Dutta[2], Zhiyu Ru[2], Bram Nauta[2], Xiang Gao[1]
[1]Marvell Semiconductor, Inc., United States; [2]University of Twente, Netherlands

A1L-J.5 **Use of Time Variant Digital Sigma-Delta for Fractional Frequency Synthesizers.....169**
Victor Rodolfo Gonzalez-Diaz, Aldo Pena Perez, Franco Maloberti
Università degli studi di Pavia, Italy

A1L-K: Wireline Communications I

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: SEGOVIA I
Chair: Tokunbo Ogunfunmi, *Santa Clara University California*

A1L-K.1 **A Novel SST Transmitter with Mutually Decoupled Impedance Self-Calibration and Equalization 173**
Shuai Chen, Liqiong Yang, Hua Jing, Feng Zhang, Zhuo Gao
Institute of Computing Technology / Chinese Academy of Science, China

A1L-K.2 **Design of High-Speed Clock Recovery Circuit for Burst-Mode Applications 177**
Soojin Kim, Kyeongsoon Cho
Hankuk University of Foreign Studies, Korea, South

A1L-K.3 **250MB/s to 3Gb/s Unilateral Continuous Rate CDR Using Precise Frequency Detector and 1/5-Rate Linear Phase Detector 181**
Nguyen Thanh Trung, Philipp Hafliger
University of Oslo, Norway

A1L-K.4 **A 10 to 11.5GHz Rotational Phase and Frequency Detector for Clock Recovery Circuit 185**
Fan-Ta Chen, Min-Sheng Kao, Yu-Hao Hsu, Chih-Hsing Lin, Jen-Ming Wu, Ching-Te Chiu, Shuo-Hung Hsu
National Tsing Hua University, Taiwan

A1L-K.5 **An Inductor-Less 13.5-Gbps 8-mW Analog Equalizer for Multi-Channel Multi-Frequency Operation 189**
Marcello Ganzerli[2], Luca Larcher[2], Simone Erba[1], Davide Sanzogni[1]
[1]STMicroelectronics, Italy; [2]Università degli Studi di Modena e Reggio Emilia, Italy

A1L-L: Advanced Transmitter Design Techniques

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: SEGOVIA II
Chair: Hassan Aboushady, *University of Pierre & Marie Curie*

A1L-L.1 **Slew-Rate Controlled 800Mbps Transmitter in 65nm CMOS 193**
Anant Kamath, Vikas Sinha, Sujoy Chakravarty
Texas Instruments, India, India

A1L-L.2 **CMOS Envelope Tracking Amplifier IC Design for High-Efficiency RF Polar Transmitters 197**
Po-Hsing Wu[2], Yan Li[2], Weibo Hu[2], Jerry Lopez[2], Donald Y.C. Lie[2], Tsorng-Juu Liang[1]
[1]National Cheng Kung University, Taiwan; [2]Texas Tech University, United States

A1L-L.3 **Design of Concurrent Multi-Band Matching Networks 201**
Nagarjuna Nallam, Shouri Chatterjee
Indian Institute of Technology, Delhi, India

A1L-L.4 **Autonomous Predistortion Calibration of an RF Power Amplifier 205**
Imran Bashir[2], Bogdan Staszewski[1]
[1]Technische Universiteit Delft, Netherlands; [2]University of Texas at Dallas, United States

A1L-L.5 **A Cartesian Feedback Feedforward Transmitter 209**
Sungmin Ock, Jaegan Ko, Ranjit Gharpurey
University of Texas at Austin, United States

A1L-M: Oscillators

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: SEGOVIA III
Chair(s): Orla Feely, *University College Dublin*
Jinhu Lu, *Chinese Academy of Sciences*

A1L-M.1 **Low Phase Noise on-Chip Oscillator for Implantable Biomedical Applications 213**
Fatemeh Aghlmand, Mojtaba Atarodi, Saeed Saeedi
Sharif University of Technology, Iran

A1L-M.2 **On the Bias Noise to Phase Noise Conversion in Harmonic Oscillators Using Groszkowski Theory 217**
Andrea Bevilacqua[2], Pietro Andreani[1]
[1]Lund University, Sweden; [2]Università degli Studi di Padova, Italy

A1L-M.3 **A Phase-Noise Model for Nonlinear Piezoelectrically-Actuated MEMS Oscillators 221**
Mauricio Pardo, Logan Sorenson, Farrokh Ayazi
Georgia Institute of Technology, United States

A1L-M.4 **A Regulated 3.1-10.6 GHz Linear Dual-Tuning Differential Ring Oscillator for UWB Applications 225**
Li Lu[1], Changzhi Li[1], Jenshan Lin[2]
[1]Texas Tech University, United States; [2]University of Florida, United States

A1L-M.5 **Supply Noise Insensitive Ring VCO with on-Chip Adaptive Bias-Current and Voltage-Swing Control 229**
Young-Seok Park, Woo-Young Choi
Yonsei University, Korea, South

A1L-N: Power Converter I

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: SEGOVIA IV
Chair(s): Adrian Ioinovici, *Holon Institute of Technology*
Siew-Chong Tan, *The Hong Kong Polytechnic University*

A1L-N.1 **A 14V-Output Adaptive-Off-Time Boost Converter with Quasi-Fixed-Frequency in Full Loading Range 233**
Ming Chak Lee, Xiaocheng Jing, Philip K. T. Mok
Hong Kong University of Science and Technology, Hong Kong

A1L-N.2 **A High-Efficiency PWM DC-DC Buck Converter with a Novel DCM Control Under Light-Load 237**
Chu-Hsiang Chia, Pui-Sui Lei, Robert Chang
National Chung Hsing University, Taiwan

A1L-N.3 **Active-Clamp ZVS Two-Switch Flyback Converter 241**
Dakshina Murthy-Bellur[1], Marian Kazimierczuk[2]
[1]Pennsylvania State University & Behrend College, United States; [2]Wright State University, United States

A1L-N.4 **Integrated SIMO DC-DC Converter with on-Line Charge Meter for Adaptive PCCM Operation 245**
Yi Zhang, Dongsheng Ma
University of Texas at Dallas, United States

A1L-N.5 **Nonisolated High Step-Up Stacked DC-DC Converter Based on Boost Converter Elements for High Power Application 249**
Moises Carlos Tanca Villanueva, Ivo Barbi
Universidade Federal de Santa Catarina, Brazil

A2L-A: Analog to Digital Converters II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: ALHAMBRA I
Chair: Jorge Fernandes, *Inesc-ID*

A2L-A.1 **Comparator-Based Switched-Capacitor Pipelined ADC with Background Offset Calibration.....253**
Ji-Eun Jang
Industrial Technology Research Institute, Taiwan

A2L-A.2 **An 11b Pipeline ADC with Dual Sampling Technique for Converting Multi-Carrier Signals.....257**
Yu Lin[2], Kostas Doris[1], Hans Hegt[2], Arthur van Roermund[2]
[1]NXP Semiconductors, Netherlands; [2]Technische Universiteit Eindhoven, Netherlands

A2L-A.3 **An Energy-Efficient 1MSps 7µW 11.9fJ/Conversion Step 7pJ/Sample 10-Bit SAR ADC in 90nm.....261**
Taimur Kuntz[2], Cesar Rodrigues[2], Saeid Nooshabadi[1]
[1]Michigan Technological University, United States; [2]Universidade Federal de Santa Maria, Brazil

A2L-A.4 **A Deflection Criterion for Time-Interleaved Analog-to-Digital Converters 265**
Andrew Bean, Andrew Singer
University of Illinois at Urbana-Champaign, United States

A2L-A.5 **SNR Measurement Based on Linearity Test for ADC BIST 269**
Jingbo Duan, Degang Chen
Iowa State University, United States

A2L-B: Low-Noise Amplifiers

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: ALHAMBRA II
Chair: Luis Oliveira, *Universidade Nova de Lisboa*

A2L-B.1 **Design Considerations and Experimental Results of Continuously-Tuned Reconfigurable CMOS LNAs 273**
Edwin C. Becerra-Alvarez[2], José M. de la Rosa[2], Federico Sandoval-Ibarra[1]
[1]CINVESTAV, Unidad Guadalajara, Mexico; [2]IMSE-CNM, CSIC and Universidad de Sevilla, Spain

A2L-B.2 **A Low Power UWB Very Low Noise Amplifier Using an Improved Noise Reduction Technique 277**
Mohammad Sadegh Mehrjoo, Mohammad Yavari
Amirkabir University of Technology, Iran

A2L-B.3 **A Compact CMOS UWB LNA Using Tunable Active Inductors for WLAN Interference Rejection 281**
Md Mahbub Reja, Igor Filanovsky, Kambiz Moez
University of Alberta, Canada

A2L-B.4 **Orthogonally Tunable Inductorless RF LNA for Adaptive Wireless Systems 285**
Shreyas Sen[1], Marian Verhelst[2], Abhijit Chatterjee[1]
[1]Georgia Institute of Technology, United States; [2]Intel Labs, United States

A2L-B.5 **A Single-to-Differential LNA Topology with Robust Output Gain-Phase Balancing Against Balun Imbalance 289**
Miguel Martins[1], Pui-In Mak[2], Rui Martins[2]
[1]INESC-ID / Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal; [2]University of Macau, Macau

A2L-C: Emerging Energy & Power Integrated Circuits

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: EL PARDO I
Chair(s): Hoi Lee, *University of Texas at Dallas*
Gabriel Rincón-Mora, *Georgia Institute of Technology*

A2L-C.1 **Versatile Capabilities of Digitally Controlled Integrated DC-DC Converters 293**
Jing Wang, Wai Tung Ng, Olivier Trescases
University of Toronto, Canada

A2L-C.2 **Ultra-Fast Hysteretic Single-Inductor-Dual-Output Boost Regulator with Predictable Noise Spectrum and Minimized Cross-Regulation 297**
Xiaocheng Jing, Philip K. T. Mok
Hong Kong University of Science and Technology, Hong Kong

A2L-C.3 **Continuous-Time CMOS Adaptive Asynchronous Sigma-Delta Modulator Approximating Low-Fs Low-inband-Error on-Chip Wideband Power Amplifier 301**
Eduard Alarcón, Daniel Fernández, Albert Garcia i Tormo, Jordi Madrenas, Alberto Poveda
Universitat Politècnica de Catalunya BarcelonaTech, Spain

A2L-C.4 **Development of Energy-Efficient Fast-Transient CMOS Low-Dropout Regulators for SoC Applications 305**
Ka Nang Leung, Marco Ho, Jianping Guo, Pui Ying Or
Chinese University of Hong Kong, Hong Kong

A2L-C.5 **Harvesting Circuits for Miniaturized Photovoltaic Cells 309**
Rajiv Damodaran Prabha, Gabriel Rincón-Mora, Suhwan Kim
Georgia Tech Analog, Power, and Energy IC Research, United States

A2L-D: Memory Circuits II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: EL PARDO II
Chair(s): Bah-Hwee Gwee, *Nanyang Technological University*
Volkan Kursun, *The Hong Kong University of Science and Technology*

A2L-D.1 **A Dual-Loop Delay Locked Loop with Multi Digital Delay Lines for GHz DRAMs.....313**
Jinyeong Moon, Hye-Young Lee
Hynix Semiconductor, Korea, South

A2L-D.2 **Fast Parallel CRC & DBI Calculation for High-Speed Memories:GDDR5 and DDR4.....317**
Jinyeong Moon[2], Joongsik Kih[1]
[1]Hanyang University, Korea, South; [2]Hynix Semiconductor, Korea, South

A2L-D.3 **Complementary Structure of Memristive Devices Based Passive Memory Arrays 321**
Sangho Shin, Kyungmin Kim, Sung-Mo Kang
University of California, Merced, United States

A2L-D.4 **A Low-Power Dual-Rail Inputs Write Method for Bit-Interleaved Memory Cells 325**
Junchao Chen, Kwen-Siong Chong, Bah-Hwee Gwee, Joseph Sylvester Chang
Nanyang Technological University, Singapore

A2L-D.5 **Programming Algorithms for Multilevel Phase-Change Memory 329**
Nikolaos Papandreou[1], Haralampos Pozidis[1], Angeliki Pantazi[1], Abu Sebastian[1], Matt Breitwisch[2], Chung Lam[2], Evangelos Eleftheriou[1]
[1]IBM Research - Zurich, Switzerland; [2]IBM T. J. Watson Research Center, United States

A2L-E: Experiences with CAS teaching

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: ORIENTE
Chair(s): Tokunbo Ogunfunmi, *Santa Clara University California*
Joos Vandewalle, *Katholieke Universiteit Leuven*

A2L-E.1 **Blended Engineering Course - Electric Circuit Theory Case Study 333**
Jerzy Rutkowski, Katarzyna Moscinska
Silesian University of Technology, Poland

A2L-E.2 **Embedded Web Server for Remote Laboratory Access for Undergraduate Students Studying Electronic Engineering 337**
Eugene Otoakhia, Tanaporn Jenmanachaiyakun, Ahmad Afaneh, Said Alzebda, Mohammad Mani, Omar Sonbul, Alexander Kalashnikov
University of Nottingham, United Kingdom

A2L-E.3 **Education of Digital and Analog Circuits Supported by Computer Algebra System 341**
Jan Kyncl, Martin Novotny
Czech Technical University in Prague, Czech Rep.

A2L-E.4 **How to Teach Memristors in EE Undergraduate Courses 345**
Jordi Albo-Canals[1], Giovanni Egidio Pazienza[2]
[1]La Salle - Universitat Ramon Llull, Spain; [2]MTA-SZTAKI & Pázmány Péter Catholic University, Hungary

A2L-E.5 **Nullators and Norators in Circuits Education: a Benefit or an Obstacle? 349**
Joos Vandewalle[1], Josef Nossek[2]
[1]Katholieke Universiteit Leuven, Belgium; [2]Technische Universität München, Germany

A2L-F: Visual Signal Analysis & Understanding

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: IMPERIAL I
Chair(s): Lap-Pui Chau, *Nanyang Technological University*
Gwo-Giun Lee, *National Cheng Kung University*

A2L-F.1 **Enhancing Keyword-Based Web Video Search with Multi-Modal Information Expansion** ..... **NA**
Yike Ma, Bailan Feng, Zhineng Chen, Juan Cao, Yongdong Zhang
Institute of Computing Technology / Chinese Academy of Science, China

A2L-F.2 **Distributed Multi-Camera Object Tracking with Bayesian Inference** **357**
Jingjing Fan[1], Yanzhe Xin[1], Fenglin Dai[1], Bo Hu[1], Jian Qiu Zhang[1], Qiyong Lu[1], Jun He[2]
[1]Fudan University, China; [2]Science and Technology Commission of Shanghai Municipality, China

A2L-F.3 **A New Network-Based Algorithm for Multi-Camera Abnormal Activity Detection** **361**
Hongyu Gao[2], Weiyao Lin[2], Xiaokang Yang[2], Hongxiang Li[1], Ning Xu[2], Jun Xie[2], Yan Li[2]
[1]North Dakota State University, United States; [2]Shanghai Jiao Tong University, China

A2L-F.4 **Stereoscopic Learning for Disparity Estimation** **365**
Zhebin Zhang[1], Yizhou Wang[2], Tingting Jiang[2], Wen Gao[2]
[1]Chinese Academy of Sciences & National Engineering Lab. for Video Technology, China; [2]Peking University, China

A2L-F.5 **Halftone Image Classification Using LMS Algorithm and Naive Bayes** ..... **NA**
Yun Fu Liu, Jing-Ming Guo
National Taiwan University of Science and Technology, Taiwan

A2L-G: Detection and Estimation

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: ALVORADA I
Chair(s): Sankar Basu, *National Science Foundation*
Wei Xing, *University of Western Sydney*

A2L-G.1 **On the Cramér–Rao Bound of Autoregressive Estimation in Noise 373**
Luis Weruaga, O. Michael Melko
Khalifa University of Science, Technology & Research, U.A.E.

A2L-G.2 **DOA Estimation of Coherent Signals for Uniform Linear Arrays with Mutual Coupling 377**
Bin Liao, Shing-Chow Chan
University of Hong Kong, Hong Kong

A2L-G.3 **An Improved Model of Jitter Effects in Analog-to-Digital Conversion 381**
Diego Bellan
Politecnico di Milano, Italy

A2L-G.4 **Distributed Kalman Filter Using Fast Polynomial Filter 385**
Ahmed Abdelgawad, Magdy Bayoumi
University of Louisiana at Lafayette, United States

A2L-G.5 **Minimum Redundancy Linear Sparse Subarrays for Direction of Arrival Estimation Without Ambiguity 390**
Jian-Feng Gu, Wei-Ping Zhu, M.N.S. Swamy
Concordia University, Canada

A2L-H: Digital Filter Design & Implementation

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: ALVORADA II
Chair(s): H.K. Kwan, *University of Windsor*
Behrouz Nowrouzian, *University of Alberta*

A2L-H.1 **An Improved Method for the Design of Variable Fractional-Delay IIR Digital Filters.....394**
Soo-Chang Pei[2], Jong-Jy Shyu[3], Cheng-Han Chan[1], Yun-Da Huang[2]
[1]National Kaohsiung First University of Science and Technology, Taiwan; [2]National Taiwan University, Taiwan; [3]National University of Kaohsiung, Taiwan

A2L-H.2 **Minimax Design of Stable IIR Filters with Sparse Coefficients.....398**
Wu-Sheng Lu[2], Takao Hinamoto[1]
[1]Hiroshima University, Japan; [2]University of Victoria, Canada

A2L-H.3 **A Spectrum Sensing Method Based on Stratified Sampling 402**
Bashar I. Ahmad, Andrzej Tarczynski
University of Westminster, United Kingdom

A2L-H.4 **Efficient Coefficient Partitioning for Decomposed Da-Based Inner-Product Computation 406**
Yu Pan, Pramod Kumar Meher
Institute for Infocomm Research, A-STAR, Singapore

A2L-H.5 **Optimization and Implementation of Continuous Time DSP-Systems by Using Granularity Reduction.....410**
Dieter Brückmann[2], Tobias Feldengut[1], Bedrich Hosticka[1], Rainer Kokozinski[1], Karsten Konrad[2], Nima Tavangaran[2]
[1]University of Duisburg-Essen, Germany; [2]University of Wuppertal, Germany

A2L-J: Digitally Intensive Frequency Synthesis Architectures for the Nano-Scale – Part II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: ITAMARATY I
Chair(s): Franco Maloberti, *University of Pavia*
Paul Sotiriadis, *Sotekco LLC*

A2L-J.1 **A Digital Frequency Synthesizer Using Adaptive Mode-Coupled Resonator Mechanism for Low Phase Noise and Low Jitter Applications 414**
Ulrich Rohde[2], Ajay Poddar[1]
[1]Synergy Microwave Corp., United States; [2]University of Cottbus, Germany

A2L-J.2 **Multipath Adaptive Cancellation of Divider Non-Linearity in Fractional-N PLLs 418**
Carlo Samori, Marco Zanuso, Salvatore Levantino, Andrea Lacaita
Politecnico di Milano, Italy

A2L-J.3 **Spurs Suppression and Deterministic Jitter Correction in All-Digital Frequency Synthesizers, Current State and Future Directions 422**
Paul Sotiriadis
SOTEKCO Electronics LLC, United States

A2L-J.4 **All-Digital RF Frequency Modulation 426**
Bogdan Staszewski
Technische Universiteit Delft, Netherlands

A2L-K: Wireline Communications II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: SEGOVIA I
Chair: Wei Xing, *University of Western Sydney*

A2L-K.1 **A 5.4 Gb/s Clock and Data Recovery Circuit Using the Seamless Loop Transition Scheme Without Phase Noise Degradation 430**
Won-Young Lee, Lee-Sup Kim
Korea Advanced Institute of Science and Technology, Korea, South

A2L-K.2 **A High Speed Transceiver Front-End Design with Fault Detection for FlexRay-Based Automotive Communication Systems 434**
Chua-Chin Wang, Chih-Lin Chen, Tai-Hao Yeh, Yi Hu, Gang-Neng Sung
National Sun Yat-Sen University, Taiwan

A2L-K.3 **High-Speed and Low Complexity Carrier Recovery for DP-QPSK Transmission 438**
Jea Hack Lee, Myung Hoon Sunwoo
Ajou University, Korea, South

A2L-K.4 **Low Complexity Baseband Transceiver Design for Narrow Band Power Line Communication 442**
Yin-Tsung Hwang, Feng-Ming Chang, Shin-Wen Chen
National Chung Hsing University, Taiwan

A2L-K.5 **A 10 Gb/s Low-Power SerDes Receiver Based on a Hybrid Speculative/SAR Digitization Technique 446**
Arash Zargaran-Yazd, Shahriar Mirabbasi, Res Saleh
University of British Columbia, Canada

A2L-L: Advanced Baseband Design Techniques

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: SEGOVIA II
Chair: Wael Badawy, *Intelliview*

A2L-L.1 **A Progammable Baseband Anti-Alias Filter for a Passive-Mixer-Based, SAW-Less, Multi-Band, Multi-Mode Wedge Transmitter 450**
Sandeep D'Souza[5], Frank Chang[5], Sudhakar Pamarti[5], Bipul Agarwal[3], Hossein Zarei[1], Tirdad Sowlati[2], Roc Berenguer[4]
[1]Marvell Semiconductor, Inc., United States; [2]Qualcomm, Inc., United States; [3]Skyworks Solutions, Inc., United States; [4]TECNUN, Spain; [5]University of California, Los Angeles, United States

A2L-L.2 **MDFT Filter Bank Multicarrier Systems with Multiple Transmission Zeros 454**
Fernando Cruz-Roldán[1], Manuel Blanco-Velasco[1], Juan Ignacio Godino Llorente[2]
[1]Universidad de Alcalá, Spain; [2]Universidad Politécnica de Madrid, Spain

A2L-L.3 **All Digital Time Tracking Loop for DVB-H and DVB-T 458**
Mohamed Mohi[2], Ahmed F. Shalash[1]
[1]Cairo University, Egypt; [2]Valeo, Egypt

A2L-L.4 **A Channel Estimation Scheme for Chinese DTTB System Combating Long Echo and High Doppler Shift 462**
Yizhi Wang, Yun Chen, Yunlong Ge, Huxiong Xu, Xiaoyang Zeng
Fudan University, China

A2L-L.5 **Improved Matching Pursuit Algorithm and Architecture for LTE Channel Estimation 466**
Johan Löfgren, Ove Edfors, Peter Nilsson
Lund University, Sweden

A2L-M: PLL

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: SEGOVIA III
Chair(s): Mustak E. Yalcin, *Istanbul Technical University*
Jianjun Zhou, *Shanghai Jiao Tong University*

A2L-M.1 **A Band-Reject Nested-PLL Phase-Noise Reduction Scheme for Clock-Cleaners 470**
Mauricio Pardo, Farrokh Ayazi
Georgia Institute of Technology, United States

A2L-M.2 **A Wide-Tuning Quasi-Type-I PLL with Voltage-Mode Frequency Acquisition Aid 474**
Zhuo Zhang, Woogeun Rhee, Zhihua Wang
Tsinghua University, China

A2L-M.3 **Glitch-Free Multi-Modulus Frequency Divider for Quantization Noise Suppression in Fractional-N PLLs 478**
Xiaoming Liu, Jing Jin, Xi Li, Jianjun Zhou
Shanghai Jiao Tong University, China

A2L-M.4 **A New Frequency Synthesizers Stabilization Method Based on a Mixed Phase Locked Loop and Delay Locked Loop Architecture 482**
Pierre-Olivier Lucas de Peslouan[2], Cedric Majek[2], Thierry Taris[2], Yann Deval[2], Didier Belot[1], Jean-Baptiste Begueret[2]
[1]STMicroelectronics, France; [2]University of Bordeaux / IMS Lab, France

A2L-M.5 **All Digital Phase-Locked Loop Using Active Inductor Oscillator and Novel Locking Algorithm.....486**
Tzu-Chi Huang[3], Hong-Yi Huang[4], Jen-Chieh Liu[1], Kuo-Hsing Cheng[1], Ching-Hsing Luo[2]
[1]National Central University, Taiwan; [2]National Cheng Kung University, Taiwan; [3]National Cheng Kung University & National Chiao Tung University, Taiwan; [4]National Taipei University, Taiwan

A2L-N: Power Converter II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: SEGOVIA IV
Chair(s): Marian Kazimierczuk, *Wright State University*
Hirotaka Koizumi, *Tokyo University of Science*

A2L-N.1 **A Common Grounded Z-Source Buck-Boost Converter 490**
Masato Asano, Daiki Abe, Hirotaka Koizumi
Tokyo University of Science, Japan

A2L-N.2 **Switch Bootstrapping Technique for Voltage Doublers and Double Charge Pumps 494**
Younis Allasasmeh, Stefano Gregori
University of Guelph, Canada

A2L-N.3 **Study and Implementation of High Frequency Pulse LED Driver with Self-Oscillating Circuit 498**
Yu-Sheng Chen, Tsorng-Juu Liang, Kai-Hui Chen, Jer-Nan Juang
National Cheng Kung University, Taiwan

A2L-N.4 **Cost Efficient Mains Powered Supply Concepts for Wireless Sensor Nodes 502**
Franz Lukasch
Technische Universität Wien, Austria

A2L-N.5 **A Fully Integrated Wide-Band PID Controller with Capacitor-Less Compensation for Step-Down DC-DC Converter 506**
Hyun-Hee Park, Young-Jin Woo, Gyu-Hyeong Cho
Korea Advanced Institute of Science and Technology, Korea, South

A3L-A: Analog to Digital Converters III

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: ALHAMBRA I
Chair: Shahriar Mirabbasi, *University of British Columbia*

A3L-A.1 **A 1V 15-Bit Audio Delta Sigma ADC in 0.18µm CMOS 510**
Liyuan Liu, Dongmei Li, Liangdong Chen, Yafei Ye, Zhihua Wang
Tsinghua University, China

A3L-A.2 **Analysis of Random Capacitor Mismatch Errors in Pipeline Analog-to-Digital Converters 514**
Gholamreza Nikandish, Ali Medi
Sharif University of Technology, Iran

A3L-A.3 **A 40-nm 640-µm^2 45-dB Opampless All-Digital Second-Order MASH Delta Sigma ADC 518**
Toshihiro Konishi, Hyeokjong Lee, Shintaro Izumi, Masahiko Yoshimoto, Hiroshi Kawaguchi
Kobe University, Japan

A3L-A.4 **An Incremental Sigma Delta Converter for Compressive Sensing Applications 522**
Hsuan-Tsung Wang, Walter Leon-Salas
University of Missouri-Kansas City, United States

A3L-A.5 **The Inconvenient Truth About Alias Rejection in Continuous Time Delta Sigma Converters 526**
Shanthi Pavan
Indian Institute of Technology, Madras, India

A3L-B: Wireless Circuits

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: ALHAMBRA II
Chair: Thierry Taris, *Laboratory for Integrated Micro Mechatronic Systems*

A3L-B.1 **A 65nm CMOS Current-Mode Receiver Front-End 530**
Saul Rodriguez, Ana Rusu
Royal Institute of Technology, Sweden

A3L-B.2 **A 2.4μW Wake-Up Receiver for Wireless Sensor Nodes with -71dBm Sensitivity 534**
Christian Hambeck[2], Stefan Mahlknecht[2], Thomas Herndl[1]
[1]Infineon Technologies Austria AG, Austria; [2]Technische Universität Wien, Austria

A3L-B.3 **A 2-Pin Input Multi Frequency Power Scavenging Unit for Wireless Sensor Nodes and RFID Tags 538**
Hannes Reinisch[1], Stefan Gruber[3], Hartwig Unterassinger[2], Martin Wiessflecker[3], Günter Hofer[3], Wolfgang Pribyl[2], Gerald Holweg[3]
[1]Graz University of Technology, Austria; [2]Graz University of Technology Austria AG, Austria; [3]Infineon Technologies Austria AG, Austria

A3L-B.4 **Adaptive Calibration of IIP2 in Direct Down-Conversion Mixers with Modified LMS Algorithm 542**
Zhijian Lu, Peichen Jiang, Tingting Mo, Jianjun Zhou
Shanghai Jiao Tong University, China

A3L-B.5 **An ISM 2.4 GHz Low-IF Receiver Frontend 546**
André Esteves, José Dores, Pedro Matos, Miguel Martins, Jorge Fernandes
INESC-ID / Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal

A3L-C: Design Techniques for Storage Elements

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: EL PARDO I
Chair(s): Kwen-Siong Chong, *Nanyang Technological University*
Bah-Hwee Gwee, *Nanyang Technological University*

A3L-C.1 **Variable-Duty-Cycle Scheduling in Double-Edge-Triggered Flip-Flop-Based High-Level Synthesis 550**
Keisuke Inoue, Mineo Kaneko
Japan Advanced Institute of Science and Technology, Japan

A3L-C.2 **TG Master-Slave FFs: High-Speed Optimization 554**
Elio Consoli, Gaetano Palumbo, Melita Pennisi
Università degli Studi di Catania, Italy

A3L-C.3 **A Clock Gated Flip-Flop for Low Power Applications in 90 nm CMOS 558**
Mohamed Shaker, Magdy Bayoumi
University of Louisiana at Lafayette, United States

A3L-C.4 **DET FF Topologies: a Detailed Investigation in the Energy-Delay-Area Domain 563**
Massimo Alioto[2], Elio Consoli[1], Gaetano Palumbo[1]
[1]Università degli Studi di Catania, Italy; [2]Università degli Studi di Siena and Berkeley Wireless Research Center, Italy

A3L-C.5 **Evaluation of 90nm 6T-SRAM as Physical Unclonable Function for Secure Key Generation in Wireless Sensor Nodes 567**
Georgios Selimis[1], Mario Konijnenburg[1], Maryam Ashouei[1], Jos Huisken[1], Harmke de Groot[1], Vincent van der Leest[2], Geert-Jan Schrijen[2], Marten van Hulst[2], Pim Tuyls[2]
[1]IMEC-NL, Holst Centre, Netherlands; [2]Intrinsic-ID, Netherlands

A3L-D: VLSI for Video Systems I

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: EL PARDO II
Chair(s): Jinsang Kim, *Kyung Hee University*
Vasily Moshnyaga, *Fukuoka University*

A3L-D.1 **Power-Aware Design with Various Low-Power Algorithms for an H.264/AVC Encoder 571**
Hyun Kim, Chae Eun Rhee, Jin-Sung Kim, Sunwoong Kim, Hyuk-Jae Lee
Seoul National University, Korea, South

A3L-D.2 **Area-Efficient Fast Scheduling Schemes for MVC Prediction Architecture 575**
Minsu Choi[1], Jinsang Kim[1], Won-Kyung Cho[1], Jinwook Burm[2]
[1]Kyung Hee University, Korea, South; [2]Sogang University, Korea, South

A3L-D.3 **A High Throughput H.264/AVC Intra-Frame Encoding Loop Architecture for HD1080p 579**
Cláudio Diniz[2], Bruno Zatt[2], Cristiano Thiele[2], Altamiro Amadeu Susin[3], Sergio Bampi[2], Felipe Sampaio[1], Daniel Palomino[1], Luciano Agostini[1]
[1]Universidade Federal de Pelotas, Brazil; [2]Universidade Federal do Rio Grande do Sul, Brazil; [3]Universidade Federal do Rio Grande do Sul / PPGEE, Brazil

A3L-D.4 **A Multilevel Data Reuse Scheme for Motion Estimation and its VLSI Design 583**
Mateus Grellert, Felipe Sampaio, Julio C. B. Mattos, Luciano Agostini
Universidade Federal de Pelotas, Brazil

A3L-D.5 **An Energy-Efficient 8×8 2-D DCT VLSI Architecture for Battery-Powered Portable Devices 587**
Vinicius S. Livramento, Bruno G. Moraes, Brunno A. Machado, Jose Luis Güntzel
Universidade Federal de Santa Catarina, Brazil

A3L-E: Pedagogical Innovations in Circuits, Signals & Systems Education

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: ORIENTE
Chair(s): Babak Ayazifar, *University of California Berkeley*
Joos Vandewalle, *Katholieke Universiteit Leuven*

A3L-E.1 **ISCAS 2011 Special Sessions on Education Innovations and Experiences 591**
Joos Vandewalle[1], Babak Ayazifar[2]
[1]Katholieke Universiteit Leuven, Belgium; [2]University of California, Berkeley, United States

A3L-E.2 **Analysis of Assessment Using Signals, Systems Concept Inventory for Systems Courses 595**
Tokunbo Ogunfunmi
Santa Clara University, United States

A3L-E.3 **Rethinking Fourier's Legacy in Signals and Systems Education 599**
Babak Ayazifar
University of California, Berkeley, United States

A3L-E.4 **On the Relation of Circuit Theory and Signals, Systems and Communications 603**
Josef Nossek, Michel Ivrlac
Technische Universität München, Germany

A3L-E.5 **Interactive Lecturing Techniques 605**
Raija Lehto
Tampere University of Technology, Finland

A3L-F: Visual Signal Coding & Communications

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: IMPERIAL I
Chair(s): Oscar C. Au, *Hong Kong University of Science & Technology*
Feng Wu, *Microsoft Research Asia*

A3L-F.1 **Fast Mode Decision by Using Probabilities from Arithmetic Coder 609**
You Zhou[1], Minghu Jiang[2], Feng Wu[1]
[1]Microsoft Research Asia, China; [2]Tsinghua University, China

A3L-F.2 **Enhanced Line-Based Intra Prediction with Fixed Interpolation Filtering 613**
Li Zhang[2], Siwei Ma[2], Wen Gao[2], Xin Zhao[1]
[1]Institute of Computing Technology / Chinese Academy of Science, China; [2]Peking University, China

A3L-F.3 **Integration of Plane Mode with Multiple Predictor Sets in Intra Prediction for Video Coding 617**
Guichun Li[3], Lingzhi Liu[2], Nam Ling[3], Jianhua Zheng[1], Philipp Zhang[1]
[1]Hisilicon Technologies Co., Ltd., China; [2]Huawei Technologies Co., Ltd., United States; [3]Santa Clara University, United States

A3L-F.4 **Mode-Dependent Fast Separable KLT for Block-Based Intra Coding 621**
Chuohao Yeo, Yih Han Tan, Zhengguo Li, Susanto Rahardja
Institute for Infocomm Research, A-STAR, Singapore

A3L-F.5 **A Deadline-Aware Virtual Contention Free EDCA Scheme for H.264 Video over IEEE 802.11e Wireless Networks 625**
Qian Liu[2], Zixuan Zou[1], Chang Wen Chen[2]
[1]Huawei Technologies Co., Ltd., China; [2]State University of New York at Buffalo, United States

A3L-G: Blind Signal Processing

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: ALVORADA I
Chair(s): Wei Xing Zheng, *University of Western Sydney*
Wei-Ping Zhu, *Concordia University*

A3L-G.1 **A Unitary Esprit Algorithm for Carrier Frequency Offset Estimation 629**
Tadeu Ferreira[1], Sergio Netto[2], Paulo Diniz[2]
[1]CEFET/RJ, Brazil; [2]Universidade Federal do Rio de Janeiro, Brazil

A3L-G.2 **Subband Blind Source Separation Considering Acoustic Reverberation Characteristics 633**
Paulo Batalheiro[1], Mariane Petraglia[1], Diego Haddad[2]
[1]Universidade Federal do Rio de Janeiro, Brazil; [2]Universidade Federal do Rio de Janeiro / CEFET / Nova Iguaçu, Brazil

A3L-G.3 **An Improved Method for Blind Separation of Complex-Valued Signals via Joint Diagonalization 637**
Xian-Feng Xu[2], Da-Zheng Feng[2], Wei Xing Zheng[1]
[1]University of Western Sydney, Australia; [2]Xidian University, China

A3L-G.4 **Signal Recovery in PDM Optical Communication Systems Employing Independent Component Analysis 641**
Eduardo Rosa[1], Leonardo Duarte[1], João Romano[1], Ricardo Suyama[2]
[1]Universidade Estadual de Campinas, Brazil; [2]Universidade Federal do ABC, Brazil

A3L-G.5 **A Blind Technique for Total Interference Rejection 645**
Rueywen Liu[2], Xu Wang[1], Fan He[1], Tao Yang[1], Bo Hu[1]
[1]Fudan University, China; [2]University of Notre Dame, United States

A3L-H: IC Implementation of DSP Algorithms

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: ALVORADA II
Chair(s): Oscar Gustafsson, *Linkoping University*
Tapio Saramäki, *Tampere University of Technology*

A3L-H.1 **FPGA Implementation of a Spiking Neural Network for Pattern Matching 649**
Louis-Charles Caron, Frédéric Mailhot, Jean Rouat
Université de Sherbrooke, Canada

A3L-H.2 **Combining ISA Extensions and Subsetting for Improved ASIP Performance and Cost 653**
Simon Rajotte, Diana Carolina Gil, J.M. Pierre Langlois
École Polytechnique de Montréal, Canada

A3L-H.3 **Bit-Parallel Multiple Constant Multiplication Using Look-Up Tables on FPGA 657**
Mathias Faust, Chip Hong Chang
Nanyang Technological University, Singapore

A3L-H.4 **Implementation of Time-Multiplexed Sparse Periodic FIR Filters for FRM on FPGAs 661**
Syed Asad Alam, Oscar Gustafsson
Linköping University, Sweden

A3L-H.5 **Asynchronous-QDI 2D IIR Digital Filter Circuits 665**
Nilanka Rajapaksha, Arjuna Madanayake
University of Akron, United States

A3L-J: Spike-Based Systems

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: ITAMARATY I
Chair(s): Tobi Delbruck, *University of Zurich & ETH Zurich*
John Harris, *University of Florida, Gainesville*

A3L-J.1 **Maximum Likelihood Parameter Estimation of a Spiking Silicon Neuron 669**
Alexander Russell, Ralph Etienne-Cummings
Johns Hopkins University, United States

A3L-J.2 **A Combinational Digital Logic Approach to STDP 673**
Andrew Cassidy[1], Andreas Andreou[1], Julius Georgiou[2]
[1]Johns Hopkins University, United States; [2]University of Cyprus, Cyprus

A3L-J.3 **Mismatch Reduction Through Dendritic Nonlinearities in a 2D Silicon Dendritic Neuron Array 677**
Yingxue Wang, Shih-Chii Liu
University of Zurich/ETH Zurich, Switzerland

A3L-J.4 **An In-silico Glial Microdomain to Invoke Excitability in Cortical Neural Networks 681**
Jonathan Joshi, Alice C. Parker, Ko-Chung Tseng
University of Southern California, United States

A3L-J.5 **The Time Machine: a Novel Spike-Based Computation Architecture 685**
Vaibhav Garg, Ravi Shekhar, John G. Harris
University of Florida, United States

A3L-K: MIMO Communications Systems

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: SEGOVIA I
Chair: Shoba Krishnan, *Santa Clara University*

A3L-K.1 **Detecting Multi-Mode MIMO Signals: Algorithm and Architecture Design 689**
Liang Liu, Peter Nilsson
Lund University, Sweden

A3L-K.2 **Scalar Quantizer Based Feedback of the Channel Direction Information in Mu-Miso Systems 693**
Israa Slim, Amine Mezghani, Josef A. Nossek
Technische Universität München, Germany

A3L-K.3 **Low-Complexity Design of a 8×8 Modulation Configurable K-Best MIMO Detector ..... NA**
Chin-Kuo Jao, Shih-Kun Lin, Kai-Chung Cheng, Li-Wei Chang, Bo-Han Chen, Muh-Tian Shiue
National Central University, Taiwan

A3L-K.4 **Performance Analysis of Lattice-Reduction Algorithms for a Novel LR-Compatible K-Best MIMO Detector 701**
Ameer Youssef, Mahdi Shabany, Glenn Gulak
University of Toronto, Canada

A3L-K.5 **FPGA Implementation of Channel Estimation for MIMO-OFDM 705**
Jeoong Sung Park, Tokunbo Ogunfunmi
Santa Clara University, United States

A3L-L: Cryptography & Security for Communications Systems

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: SEGOVIA II
Chair: Maire O'Neill, *Queen's University, Belfast*

A3L-L.1 **A New Algorithm for Double Scalar Multiplication over Koblitz Curves 709**
Jithra Adikari[2], Vassil Dimitrov[2], Renato Cintra[1]
[1]Universidade Federal de Pernambuco, Brazil; [2]University of Calgary, Canada

A3L-L.2 **A Dual-Field Elliptic Curve Cryptographic Processor with a Radix-4 Unified Division Unit 713**
Yao-Lin Chen, Jen-Wei Lee, Po-Chun Liu, Hsie-Chia Chang, Chen-Yi Lee
National Chiao Tung University, Taiwan

A3L-L.3 **A Maximal Entropy Digital Chaotic Circuit 717**
Alan Michaels
Harris Corporation, United States

A3L-L.4 **Counteracting Power Analysis Attack Using Static Single-Ended Logic 721**
Amir Khatib Zadeh[2], Catherine Gebotys[2], Shahab Ardalan[1]
[1]San Jose State University, United States; [2]University of Waterloo, Canada

A3L-L.5 **An Oscillator-Based True Random Number Generator with Jitter Amplifier 725**
Takehiko Amaki, Masanori Hashimoto, Takao Onoye
Osaka University, Japan

A3L-M: Synchronization

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: SEGOVIA III
Chair(s): Zbigniew Galias, *AGH University of Science and Technology*
Yoko Uwate, *The University of Tokushima*

A3L-M.1 **Synchronization of the Kuramoto Model with Multi-Scale-Free Property 729**
Jin Fan
Donghua University, China

A3L-M.2 **Synchronization of Bounded Piecewise Smooth Systems 733**
Mario Di Bernardo, Franco Garofalo, Davide Liuzza
Università degli Studi di Napoli Federico II, Italy

A3L-M.3 **Master Stability Function for Networks of Chua's Circuits with Static and Dynamic Couplings 737**
Marco Righero, Fernando Corinto, Mario Biey
Politecnico di Torino, Italy

A3L-M.4 **Synchronization of Networks of Non-Identical Chua Circuits: Analysis and Experiments 741**
Massimiliano De Magistris, Mario Di Bernardo, Edmondo Di Tucci, Sabato Manfredi
Università degli Studi di Napoli Federico II, Italy

A3L-M.5 **Synchronizing Coupled Oscillators in Polygonal Networks with Frustration 745**
Yoko Uwate, Yoshifumi Nishio
Tokushima University, Japan

A3L-N: Power Converter III

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: SEGOVIA IV
Chair(s): Hirotaka Koizumi, *Tokyo University of Science*
C K Micheal Tse, *The Hong Kong Polytechnic University*

A3L-N.1 **Power Conversion Efficiency of Class-E Power Amplifier Outside Nominal Operation** 749
Tomoharu Nagashima[1], Xiuqin Wei[1], Hiroo Sekiya[1], Marian Kazimierczuk[2]
[1]Chiba University, Japan; [2]Wright State University, United States

A3L-N.2 **Reduction of Equivalent Series Inductor Effect in Constant on-Time Control DC-DC Converter Without ESR Compensation** 753
Yu-Huei Lee[2], Wang-Wei Lai[2], Wan-Yu Pai[2], Ke-Horng Chen[2], Ming-Jhe Du[3], Shih-Hsien Cheng[1]
[1]Industrial Technology Research Institute, Taiwan; [2]National Chiao Tung University, Taiwan; [3]National Dong Hwa University, Taiwan

A3L-N.3 **A 80V Output Voltage Boost Converter with Low Voltage Ripple for Avalanche Photodiode(APD)** 757
Yao-Yi Yang[3], Chun-Yu Hsieh[3], Tzu-Chi Huang[2], Yu-Huei Lee[3], Shih-Wei Wang[3], Ming-Yan Fan[3], Ming-Jhe Du[4], Shih-Hsien Cheng[1], Ke-Horng Chen[3]
[1]Industrial Technology Research Institute, Taiwan; [2]Institute of Electrical and Control Engineering, National Chiao Tung University, Taiwan; [3]National Chiao Tung University, Taiwan; [4]National Dong Hwa University, Taiwan

A3L-N.4 **Single Controller Current Balance (SCCB) Technique for Voltage-Mode Multi-Phase Buck Converter** 761
Yu-Ping Huang[2], Yi-Ping Su[2], Yu-Huei Lee[2], Kuan-Yu Chu[2], Chun-Jen Shih[2], Ke-Horng Chen[2], Ming-Jhe Du[1], Shih-Hsien Cheng[1]
[1]Industrial Technology Research Institute, Taiwan; [2]National Chiao Tung University, Taiwan

A3L-N.5 **Assessment of Direct VRM Topologies** 765
Úrsula Ribes-Mallada[1], Ramon Leyva[2], Pedro Garcés[2]
[1]DEEEA-URV, Spain; [2]Universitat Rovira i Virgili, Spain

A4P-P: Tools & Methods for Analog Circuit Design

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: Louvre
Chair: Janos Ladvanszky, *Ericsson*

A4P-P.1 **Software Based Separation of Amplitude and Phase Noises in Time Domain 769**
János Ladvánszky, Gábor Kovács
Ericsson R&D, Hungary

A4P-P.2 **Verilog-A Modeling of SPAD Statistical Phenomena 773**
Gianluca Giustolisi, Rosario Mita, Gaetano Palumbo
Università degli Studi di Catania, Italy

A4P-P.3 **Design and Analysis of Fuzzy Logic Based Robust PID Controller for PWM-Based Switching Converter 777**
Ghulam Abbas[3], Nacer Abouchi[2], Awais Sani[4], Cyril Condemine[1]
[1]CEA, LETI, Minatec, France; [2]CPE-Lyon, France; [3]INSA Lyon, France; [4]Université de Bretagne-Sud, France

A4P-P.4 **A Novel Operating-Point Driven Method for the Sizing of Analog IC 781**
Bo Liu[2], Murat Pak[1], Xuezhi Zheng[2], Georges Gielen[2]
[1]Bogazici University, Turkey; [2]Katholieke Universiteit Leuven / ESAT-MICAS, Belgium

A4P-P.5 **Comparative Analysis of Information Rates of Simple Amplifier Topologies 785**
Nicole McFarlane[2], Pamela Abshire[1]
[1]University of Maryland, United States; [2]University of Tennessee, United States

A4P-Q: Circuits for Biomedical Systems & Bio-Inspired Systems

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Ralph Etienne-Cummings, *Johns Hopkins University*
Joachim Rodrigues, *Lund University*

A4P-Q.1 **Photocurrent Dependent Response of a SPAD Biased by a Charge Pump 789**
Mohammed Al-Rawhani[1], David Cumming[1], Danial Chitnis[2], Steve Collins[2]
[1]University of Glasgow, United Kingdom; [2]University of Oxford, United Kingdom

A4P-Q.2 **Current Mode Feed-Forward Gain Control for 0.8V CMOS Hearing Aid 793**
Fanyang Li, Haigang Yang, Yu Wang, Qisong Wu
Chinese Academy of Sciences, China

A4P-Q.4 **Bio-Inspired Nano-Photodiode for Low Light, High Resolution and Crosstalk-Free CMOS Image Sensing 797**
Faycal Saffih[1], Nathaniel Fitzpatrick[2], Mohammad Ali Mohammad[2], Stephane Evoy[2], Bo Cui[3]
[1]King Abdullah University for Science and Technology, Saudi Arabia; [2]University of Alberta, Canada; [3]University of Waterloo, Canada

A4P-Q.5 **A Low Power Independent Component Analysis Processor in 90nm CMOS Technology for Portable EEG Signal Processing Systems 801**
Chiu-Kuo Chen[1], Yi-Yuan Wang[1], Zong-Han Hsieh[1], Ericson Chua[1], Wai-Chi Fang[1], Tzyy-Ping Jung[2]
[1]National Chiao Tung University, Taiwan; [2]University of California, San Diego, United States

A4P-Q.6 **Compressed Sensing Reconstruction: Comparative Study with Applications to ECG Bio-Signals 805**
Anna Dixon, Emily Allstot, Andrew Chen, Daibashish Gangopadhyay, David Allstot
University of Washington, United States

A4P-Q.7 **A Multiparametric Biosensor Array for on-Chip Cell Culture with Feedback Controlled Microfluidics 809**
David Welch, Jennifer Blain Christen
Arizona State University, United States

A4P-R: Power Eletronic Circuits I

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Eduard Alarcon, *Universitat Politècnica de Catalunya*
Marian Kazimierczuk, *Wright State University*

A4P-R.1 **A High Voltage Battery Charger with Smooth Charge Mode Transition in BCD Process 813**
Shang-Hsien Yang, Jen-Wei Liu, Yi-Hong Wu, Deng-Sian Wang, Chua-Chin Wang
National Sun Yat-Sen University, Taiwan

A4P-R.2 **Bonding-Wire Triangular Spiral Inductor for on-Chip Switching Power Converters 817**
Gerard Villar, Julià Delós, Eduard Alarcón
Universitat Politècnica de Catalunya BarcelonaTech, Spain

A4P-R.3 **Meshing Strategy of Equivalent Substrate Schematic in SMART Power IC 821**
Fabrizio Lo Conte, Jean-Michel Sallese, Maher Kayal
École Polytechnique Fédérale de Lausanne, Switzerland

A4P-R.4 **A Novel Control Technique to Eliminate Output-Voltage-Ripple in Switched-Capacitor DC-DC Converters 825**
Loai Salem[2], Rinkle Jain[1]
[1]Intel Circuit Research Lab, United States; [2]Northwestern University / Nile University, Egypt

A4P-R.5 **A 300Mv Low-Voltage Start-Up Circuit for Energy Harvesting Systems 829**
Edgardo Méndez-Delgado, Guillermo Serrano
University of Puerto Rico - Mayagüez, Puerto Rico

A4P-S: Low-Power Circuits II

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Malgorzata Chrzanowska-Jeske, *Portland State University*
Ibrahim N. Hajj, *American University of Beirut*

A4P-S.1 **A Semi-Static Threshold-Triggered Delay Element for Low Power Applications 833**
Louis Jung, Torsten Lehmann, Gregg Suaning, Nigel Lovell
University of New South Wales, Australia

A4P-S.2 **Design Exploration of a 65 nm Sub-VT CMOS Digital Decimation Filter Chain 837**
Syed Muhammad Yasser Sherazi, Peter Nilsson, Omer Can Akgun, Henrik Sjöland, Joachim Neves Rodrigues
Lund University, Sweden

A4P-S.4 **A Low-Power 8-Bit SAR ADC for a QCIF Image Sensor 841**
Recep Özgün, Joseph Lin, Francisco Tejada, Philippe Pouliquen, Andreas Andreou
Johns Hopkins University, United States

A4P-S.5 **Improve Accuracy of Delay Element by Filtering False Path for Low Power Desychronized Circuits 845**
Jun Xu, Xiangku Li
Institute of Computing Technology / Chinese Academy of Science, China

A4P-T: Image Processing & Analysis

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: Louvre
Chair: M.N.S. Swamy, *Concordia University*

A4P-T.1 **Comparative Analysis of Contrast Enhancement Algorithms in Surveillance Imaging 849**
Diana Gil, Rana Farah, J.M. Pierre Langlois, Guillaume-Alexandre Bilodeau, Yvon Savaria
École Polytechnique de Montréal, Canada

A4P-T.2 **A FPGA Based Fast Runtime Reconfigurable Real-Time Multi-Object-Tracker 853**
Matthias Rümmele-Werner[1], Thomas Perschke[1], Lars Braun[2], Michael Hübner[2], Jürgen Becker[3]
[1]Fraunhofer Institute of Optronics, System Technologies and Image Exploitation, Germany; [2]Institute for Information Processing Technologies - Karlsruhe Institute of Technology, Germany; [3]Karlsruhe Institute of Technology, Germany

A4P-T.3 **Auto-Generated Strokes for Motion Segmentation 857**
Zhiqiang Tian, Jianru Xue, Ce Li, Xuguang Lan, Nanning Zheng
Xi'an Jiaotong University, China

A4P-T.4 **An Efficient Image Interpolation Algorithm Based Upon the Switching and Self Learned Characteristics for Natural Images 861**
Sunil Jaiswal, Vinit Jakhetiya, Anil Tiwari
LNMIIT, India

A4P-U: Neuromorphic Circuits & Systems

Time: Monday, May 16, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Piotr Dudek, *University of Manchester*
John Harris, *University of Florida, Gainesville*

A4P-U.1 **A Neuromorphic Cross-Correlation Chip 865**
Tara Hamilton[2], Jonathan Tapson[1]
[1]University of Cape Town, South Africa; [2]University of New South Wales, Australia

A4P-U.2 **A Programmable Axonal Propagation Delay Circuit for Time-Delay Spiking Neural Networks 869**
Runchun Wang, Craig Jin, Alistair McEwan, Andr¨¦ van Schaik
University of Sydney, Australia

A4P-U.3 **Systematic Configuration and Automatic Tuning of Neuromorphic Systems 873**
Sadique Sheik, Fabio Stefanini, Emre Neftci, Elisabetta Chicca, Giacomo Indiveri
University of Zurich/ETH Zurich, Switzerland

A4P-U.4 **Analogue CMOS Circuit Implementation of a Dopamine Modulated Synapse 877**
Jayawan Wijekoon, Piotr Dudek
University of Manchester, United Kingdom

A4P-U.5 **An Improved FPGA Implementation of CNN Gabor–Type Filters 881**
Evren Cesur, Nerhun Yildiz, Vedat Tavsanoglu
Yildiz Technical University, Turkey

A5P-P: Low Voltage, Low Power Circuits

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: Louvre
Chair: Robert Sobot, *University of Western Ontario*

A5P-P.1 **Simple Improvement Stage for Low Voltage WTA and Rank Order Circuits 885**
Jesus Ezequiel Molinar-Solis[1], Rodolfo Garcia-Lozano[1], Alejandra Morales-Ramirez[1], Jaime Ramírez-Angulo[2]
[1]Mexico State Automous University UAEM, Mexico; [2]New Mexico State University, United States

A5P-P.2 **Active and Passive Dynamic Cascode Calibration Schemes for High Precision Current Sources ..... NA**
Jaime Ramírez-Angulo[1], Enrique López-Morillo[2], Ramon G. Carvajal[2], Antonio J. López-Martïn[3]
[1]New Mexico State University, United States; [2]Universidad de Sevilla, Spain; [3]Universidad Pública de Navarra, Spain

A5P-P.3 **All-CMOS Subbandgap Reference Circuit Operating at Low Supply Voltage 893**
Yi Yang[2], David Binkley[2], Lu Li[1], Changzhan Gu[1], Changzhi Li[1]
[1]Texas Tech University, United States; [2]University of North Carolina at Charlotte, United States

A5P-P.4 **Energy Harvesting Circuit Using Integrated Transformer 897**
Hugo Gonçalves, Miguel Martins, Jorge Fernandes
INESC-ID / Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal

A5P-P.5 **A Sub-1V CMOS Voltage Reference Generator 901**
Shadi Harb[1], William Eisenstadt[2], Robert Fox[2]
[1]Intel Corporation, United States; [2]University of Florida, United States

A5P-P.6 **Fast Transient Response Capacitor-Free Linear Voltage Regulator in 65nm CMOS 905**
Thomas Jackum[1], Gerhard Maderbacher[1], Roman Riederer[3], Wolfgang Pribyl[2]
[1]Graz University of Technology, Austria; [2]Graz University of Technology Austria AG, Austria; [3]Infineon Technologies Austria, Austria

A5P-Q: Wireless, Wearable & Implantable/Injectable Technology II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: Louvre
Chair(s): Manuel Delgado-Restituto, *Instituto de Microelectrónica de Sevilla*
Mohamad Sawan, *École Polytechnique Montréal*

A5P-Q.1 **Novel MIMO 4-DOF Position Control for Capsule Endoscope.....909**
Ibrahim Mohammed, Bayan Sharif, Jeffrey Neasham, Damian Giaouris
Newcastle University, United Kingdom

A5P-Q.2 **Channel Characterization for Implant to Body Surface Communication.....913**
Awais Kamboh, Andrew Mason
Michigan State University, United States

A5P-Q.3 **Duty Cycle Shift Keying Data Transfer Technique for Bio-Implantable Devices 917**
Seyed Abdollah Mirbozorgi, Ghazal Nabovati, Mohammad Maymandi-Nejad
Ferdowsi University of Mashhad, Iran

A5P-Q.4 **Channel Characterization for Galvanic Coupled in Vivo Biomedical Devices 921**
Chun-Ming Tang, Rizwan Bashirullah
University of Florida, United States

A5P-R: Power Eletronic Circuits II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: Louvre
Chair(s): Adrian Ioinovici, *Holon Institute of Technology*
Doron Shmilovitz, *Tel-Aviv University*

A5P-R.2 **Comparison of Digital LQR Techniques for DC-DC Boost Converters with Large Load Range 925**
Fabrício Hoff Dupont[1], Vinícius Foletto Montagner[1], José Renes Pinheiro[1], Humberto Pinheiro[1], Sérgio Vidal Garcia Oliveira[2], Adriano Péres[2]
[1]Universidade Federal de Santa Maria, Brazil; [2]Universidade Regional de Blumenau, Brazil

A5P-R.3 **Delta-Sigma Buck Converter – a Design Exploration for GSM Wireless Systems 929**
Kamala Hariharan, Susan Luschas, Shoba Krishnan
Santa Clara University, United States

A5P-R.4 **Current-Mode Synthetic Control (CSC) Technique for High Efficiency DC-DC Boost Converters over a Wide Load Range 933**
Yi-Ping Su[2], Yi-Chun Chen[2], Han-Hsiang Huang[2], Yu-Huei Lee[2], Yao-Yi Yang[2], Ke-Horng Chen[2], Ming-Jhe Du[3], Shih-Hsien Cheng[1]
[1]Industrial Technology Research Institute, Taiwan; [2]National Chiao Tung University, Taiwan; [3]National Dong Hwa University, Taiwan

A5P-R.5 **Electrical Characteristics of Novel ESD Protection Devices for I/O and Power Clamp 937**
Yongseo Koo[1], Kwangyeob Lee[4], Joongho Choi[6], Chanho Lee[5], Yoonsik Lee[3], Yilsuk Yang[2]
[1]Dankook University, Korea, South; [2]Electronics and Telecommunications Research Institute, Korea, South; [3]Korea Electronics Technology Institute, Korea, South; [4]Seokyeong University, Korea, South; [5]Soongsil University, Korea, South; [6]University of Seoul, Korea, South

A5P-S: VLSI for Video Systems II

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: Louvre
Chair(s): Mladen Berekovic, *TU Braunschweig*
Jinsang Kim, *Kyung Hee University*

A5P-S.1 **P2E-DWT: a Parallel and Pipelined Efficient VLSI Architecture of 2-D Discrete Wavelet Transform 941**
Milad Ghantous, Magdy Bayoumi
University of Louisiana at Lafayette, United States

A5P-S.2 **A Parallel and Area-Efficient Architecture for Deblocking Filter and Adaptive Loop Filter 945**
Juan Du, Lu Yu
Zhejiang University, China

A5P-S.3 **TV Energy Management by Camera-Based Viewer Monitoring 949**
Choong Geun Lee, Vasily Moshnyaga
Fukuoka University, Japan

A5P-S.4 **Integer-pel Motion Estimation Specific Instructions and Their Hardware Architecture for ASIP 953**
Hee Kwan Eun[1], Sung Jo Hwang[1], Myung Hoon Sunwoo[1], Young Hwan Kim[3], Hi Seok Kim[2]
[1]Ajou University, Korea, South; [2]Cheongju University, Korea, South; [3]POSTECH, Korea, South

A5P-S.5 **Novel Fractional Motion Estimation Algorithm and Architecture Using Sub-Block Combination 957**
Un Seob Kim, Wang Ho Shin, Myung Hoon Sunwoo
Ajou University, Korea, South

A5P-T: DSP for Communications

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: Louvre
Chair: Raija Else Tuulikki Lehto, *Tampere University of Technology*

A5P-T.1 **Antenna-Array 2D-IIR Digital Filters for Carrier-Modulated Frequency-Agile and Cognitive Wireless Systems 961**
Arjuna Madanayake[1], Hamid Bahrami[1], Leonard Bruton[2]
[1]University of Akron, United States; [2]University of Calgary, Canada

A5P-T.2 **Spurious Emissions Reduction Using Multirate RF Transmitter 965**
Arnaud Werquin[1], Antoine Frappé[2], Andreas Kaiser[1]
[1]IEMN-ISEN, France; [2]ISEN, France

A5P-T.3 **Design and Parallel Implementation of an Adaptive Baseline Wander Compensator for High-Speed Optical Coherent Receivers 969**
Gabriel Maggio[1], Mario Rafael Hueda[2]
[1]CONICET, Argentina; [2]Universidad Nacional de Córdoba, Argentina

A5P-T.4 **A Convex Optimization Approach to Reducing Peak-to-Average-Power Ratio in OFDM 973**
Neil Jacklin, Zhi Ding
University of California, Davis, United States

A5P-U: ADC and PLL

Time: Monday, May 16, 2011, 13:40 - 15:20
Room: Louvre
Chair: Elena Blokhina, *University College Dublin*

A5P-U.1 **MEMS with Sigma-Delta Type of Feedback Loop Control as an Iterative Map 977**
Mathieu Pladys[1], Elena Blokhina[2]
[1]Institut National des Sciences Appliquees de Toulouse, France; [2]University College Dublin, Ireland

A5P-U.2 **A 0.24 to 2.4 GHz Phase-Locked Loop with Low Supply Sensitivity in 0.18-µm CMOS.....981**
Chang-Ming Lai, Meng-Hung Shen, Yi-Da Wu, Kai-Hsiang Huang, Po-Chiun Huang
National Tsing Hua University, Taiwan

A5P-U.3 **Linear Range Extensible Phase Frequency Detector and Charge Pump for Fast Frequency Acquisition.....985**
Xiaoming Liu, Jing Jin, Cui Mao, Jianjun Zhou
Shanghai Jiao Tong University, China

A5P-U.4 **Linearization of ADCs via Digital Post Processing.....989**
Yang Yang[1], Ali Motafakker-Fard[2], Bahram Jalali[2]
[1]Beijing Institute of Technology, China; [2]University of California, Los Angeles, United States

A6P-P: Broadband Analog Signal Processing Circuits

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: Louvre
Chair: Ramesh Harjani, *University of Minnesota*

A6P-P.1 **A Broadband Fully on-Chip Low Noise Amplifier for Square Kilometre Array Radio Telescope ..... NA**
Kriyang Shah[1], Jugdutt Singh[1], Hai Le[1], Yashodhan Moghe[2], Andrew Brawley[2]
[1]La Trobe University, Australia; [2]Sapphicon Semiconductor, Australia

A6P-P.2 **A 3mW 8-Bit Radiation-Hardened-by-Design DAC for Ultra-Wide Temperature Range from -180 C to 120 C 997**
Zhenqi Chen, Foster Dai
Auburn University, United States

A6P-P.3 **Design and Analysis of a Switched-Capacitor-Based Peak Detector 1001**
Ming Zhang[1], Nicolas Llaser[2], Hervé Mathias[1]
[1]Universite Paris-Sud, France; [2]University of PARIS 11, France

A6P-P.4 **A Distributed Amplifier Based Dispersive Delay Line 1005**
Bo Xiang, Alyssa Apsel
Cornell University, United States

A6P-P.5 **A Temperature-Stable 60-dB Programmable-Gain Amplifier in 0.13-um CMOS 1009**
Xiaolang Zhang, Shahriar Mirabbasi, Lutz Lampe
University of British Columbia, Canada

A6P-Q: Life Science Applications

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: Louvre
Chair: Pau-Choo Julia Chung, *National Cheng Kung University*

A6P-Q.1 **A Physiological Valence/Arousal Model from Musical Rhythm to Heart Rhythm.....1013**
Hui-Min Wang[1], Yaw-Chern Lee[1], Brad S. Yen[1], Chun-Yen Wang[2], Sheng-Chieh Huang[1], Kea-Tiong Tang[2]
[1]National Chiao Tung University, Taiwan; [2]National Tsing Hua University, Taiwan

A6P-Q.2 **CMOS Low Current Measurement System for Biomedical Applications.....1017**
Brian Goldstein[2], Dongsoo Kim[2], Angelo Rottigni[1], Jian Xu[2], Kyle Vanderlick[2], Eugenio Culurciello[2]
[1]Politecnico di Milano, Italy; [2]Yale University, United States

A6P-Q.3 **A Novel Method to Count the Red Blood Cells in Thin Blood Films.....1021**
Saumya Kareem, Richard Morling, Izzet Kale
University of Westminster, United Kingdom

A6P-Q.4 **Classification of Brain MRI Using the LH and HI Wavelet Transform Sub-Bands 1025**
Salim Lahmiri, Mounir Boukadoum
, Canada

A6P-Q.5 **Active Noise Cancellation of Motion Artifacts in Pulse Oximetry Using Isobestic Wavelength Light Source 1029**
Chun-Yen Wang, Kea-Tiong Tang
National Tsing Hua University, Taiwan

A6P-R: Power System

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: Louvre
Chair(s): Chika Nwankpa, *Drexel University*
Costas Vournas, *National Technical University of Athens*

A6P-R.1 **Quasi-Analytical Spectrum of PWM Signals with Dead-Time for Multiple Sinusoidal Input 1033**
Fernando Chierchie[1], Eduardo Emilio Paolini[2]
[1]Universidad Nacional del Sur, Argentina; [2]Universidad Nacional del Sur / IIIE-CONICET, Argentina

A6P-R.2 **Application of Probabilistic Tabu Search to Distribution System Service Restoration 1037**
Hiroyuki Mori[1], Takayuki Muroi[2]
[1]Meiji University, Japan; [2]Tokyo Electric Power Co., Japan

A6P-R.3 **Nonlinear Control Evaluation of Two-Stage Matrix Converter Using Ideal and Non-Ideal IGBT Models 1041**
Javier Alexis Andrade-Romero, Jesus Franklin Andrade, Marat Rafikov
Universidade Federal do ABC, Brazil

A6P-R.4 **What Is the Importance of Selecting Features for Non-Technical Losses Identification? 1045**
Caio Ramos[4], Joao Papa[1], Andre Souza[3], Giovani Chiachia[2], Alexandre Falcao[2]
[1]UNESP, Brazil; [2]Universidade Estadual de Campinas, Brazil; [3]Universidade Estadual Paulista, Brazil; [4]USP, Brazil

A6P-S: Testing & Arithmetic Circuits

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: Louvre
Chair(s): Mohamed Elgamel, *University of Louisiana at Lafayette*
Lan-Da Van, *National Chiao Tung University*

A6P-S.1 **Towards Optimal CMOS Lifetime via Unified Reliability Modeling and Multi-Objective Optimization 1049**
Agathoklis Papadopoulos, Theocharis Theocharides, Maria K. Michael
University of Cyprus, Cyprus

A6P-S.2 **Nonspeculative Decimal Signed Digit Adder 1053**
Liu Han, Dongdong Chen, Khan A. Wahid, Seok-Bum Ko
University of Saskatchewan, Canada

A6P-S.3 **Spatial- and Temporal-Reliability Aware Design for Nano-Scale VLSI Circuits 1057**
Sajjad Rahaman, Qing Duan, Masud Chowdhury
University of Illinois at Chicago, United States

A6P-S.4 **Multiplier Structures for Low Power Applications in Deep-CMOS 1061**
Dursun Baran[2], Mustafa Aktan[2], Vojin G. Oklobdzija[1]
[1]New Mexico State University, United States; [2]University of Texas at Dallas, United States

A6P-S.5 **An Improved Model for Delay/Energy Estimation in Near-Threshold Flip-Flops 1065**
Sagi Fisher, Raz Dagan, Sagi Blonder, Alexander Fish
Ben-Gurion University, Israel

A6P-T: Digital Signal Processing Applications

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: Louvre
Chair(s): M. Chakraborty, *Indian Institute of Technology, Kharagpur*
Yu Yajun, *National University of Singapore*

A6P-T.1 **Low Complexity Block-Based Unbiased Frequency Estimation 1069**
Gustavo González[2], Fernando Gregorio[1], Juan Edmundo Cousseau[1]
[1]Universidad Nacional del Sur, Argentina; [2]Universidad Nacional del Sur / IIIE-CONICET, Argentina

A6P-T.2 **Bi-Criterion Optimization of Non-Uniform Filter Banks for Acoustic Echo Cancellation 1073**
Rajeev Nongpiur, Dale Shpak
University of Victoria, Canada

A6P-T.3 **Edge Detection Using Histogram Equalization and Multi-Filtering Process 1077**
Zohaib Hameed, Chunyan Wang
Concordia University, Canada

A6P-T.4 **Implementation of a Motion Sickness Evaluation System Based on EEG Spectrum Analysis 1081**
Chun-Shu Wei[1], Shang-Wen Chuang[1], Wan-Ru Wang[1], Li-Wei Ko[1], Tzyy-Ping Jung[2], Chin-Teng Lin[1]
[1]National Chiao Tung University, Taiwan; [2]University of California, San Diego, United States

A6P-T.5 **Optimal Signal Discrimination in a Low Signal-to-Noise Ratio Environment 1085**
Thiago Ciodaro Xavier[1], José Manoel de Seixas[2]
[1]UFRJ - Coppe/Poli, Brazil; [2]Universidade Federal do Rio de Janeiro, Brazil

A6P-U: Neural Networks II

Time: Monday, May 16, 2011, 15:40 - 17:20
Room: Louvre
Chair(s): John Harris, *University of Florida, Gainesville*
Jinhu Lu, *Chinese Academy of Sciences*

A6P-U.1 **A One-Layer Recurrent Neural Network for Constrained Single-Ratio Linear Fractional Programming 1089**
Qingshan Liu[2], Jun Wang[1]
[1]Chinese University of Hong Kong, Hong Kong; [2]Southeast University, China

A6P-U.2 **Recurrent Neural Network as a KWTA Selector: a Synthesis Procedure 1093**
Ruxandra Liana Costea, Corneliu Marinov
Polytechnic University of Bucharest, Romania

A6P-U.3 **GPS Offset Estimation and Correction Using Satellite Constellation Information 1097**
Vincenzo Manzoni, Andrea Corti, Alessandro Rossi, Stefano Tissino, Sergio Savaresi
Politecnico di Milano, Italy

A6P-U.4 **Prototype Rotation Based Assisted Image Analysis for 3D Vision System 1101**
Ari Paasio
University of Turku, Finland

A6P-U.5 **Prediction of Core Losses on a Three-Phase Transformer Using Neural Networks 1105**
Kleymilson Souza, Thiago Castro, Thiago Pereira, Ricardo Pontes, Arthur Braga
Universidade Federal do Ceará, Brazil

B1L-A: Sigma Delta ADC

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: ALHAMBRA I
Chair: Jose M. de la Rosa, *CNM-IMB*

B1L-A.1 **A Low-Power Sigma Delta ADC Optimized for GSM/EDGE Standard in 65-nm CMOS 1109**
Hussein Fakhoury, Chadi Jabbour, Hasham Khushk, Van Tam Nguyen, Patrick Loumeau
Telecom ParisTech, France

B1L-A.2 **Sine-Shaping Mixer for Continuous-Time Sigma-Delta ADCs 1113**
Ahmed Ashry, Hassan Aboushady
University of Pierre & Marie Curie, Paris VI / LIP6, France

B1L-A.3 **A 6.25 MHz BW 8-OSR Fifth-Order Single-Stage Sigma-Delta ADC 1117**
Chang-Seob Shin, Min-Ho Yoon, Kang-Il Cho, Young-Ju Kim, Kwang-Soo Kim, Seung-Hoon Lee, Gil-Cho Ahn
Sogang University, Korea, South

B1L-A.4 **High-Order Continuous-Time Incremental Sigma Delta ADC for Multi-Channel Applications 1121**
Julian Garcia, Ana Rusu
Royal Institute of Technology, Sweden

B1L-A.5 **A LP/HP UMTS/GSM Delta Sigma ADC Suited for a Zero-IF/Low-IF Receiver 1125**
Chadi Jabbour, Hasham Khushk, Hussein Fakhoury, Van Tam Nguyen, Patrick Loumeau
Telecom ParisTech, France

B1L-B: Oscillators & Frequency Synthesizers

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: ALHAMBRA II
Chair: Ioannis Syllaios, *UT Dallas*

B1L-B.1 **Requirement Driven Low-Power LC and Ring Oscillator Design 1129**
Maarten Lont[2], Dusan Milosevic[2], Arthur van Roermund[2], Guido Dolmans[1]
[1]Holst Centre IMEC-NL, Netherlands; [2]Technische Universiteit Eindhoven, Netherlands

B1L-B.2 **A 1 mW Low Phase-Noise Relaxation Oscillator..... 1133**
Joao Casaleiro[2], Hugo Lopes[2], Luis Oliveira[2], Jorge Fernandes[1], Manuel Silva[1]
[1]INESC-ID / Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal; [2]Universidade Nova de Lisboa / FCT, Portugal

B1L-B.3 **A 3.125 GHz Four Stage Voltage Controlled Ring Oscillator in 0.18 CMOS 1137**
Carlos Sánchez-Azqueta, Santiago Celma, Francisco Aznar
University of Zaragoza, Spain

B1L-B.4 **A 27-GHz Low-Power Push-Push LC VCO with Wide Tuning Range in 65nm CMOS... 1141**
Reza Molavi[2], Shahriar Mirabbasi[2], Hormoz Djahanshahi[1]
[1]PMC-sierra Inc., Canada; [2]University of British Columbia, Canada

B1L-B.5 **A Dual-Mode VCO Based Low-Power Synthesizer with Optimized Automatic Frequency Calibration for Software-Defined Radio 1145**
Jin Zhou, Wei Li, Deping Huang, Chen Lian, Ning Li, Junyan Ren
Fudan University, China

B1L-C: Confession Session: Learning from Others Mistakes

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: EL PARDO I
Chair(s): Tobi Delbruck, *University of Zurich & ETH Zurich*
Bernabe Linares-Barranco, *IMSE-CNM-CSIC*

B1L-C.1 **Confession Session: Learning from Others Mistakes 1149**

Tobi Delbruck[11], Bernabe Linares-Barranco[4], Pamela Abshire[10], Amine Bermak[2], Raphael Berner[11], Gert Cauwenberghs[7], Shoushun Chen[6], Jennifer Blain Christen[1], Timothy Constandinou[3], Eugenio Culurciello[12], Marc Dandin[10], Timir Datta[10], Piotr Dudek[9], Amir Eftekhar[3], Ralph Etienne-Cummings[5], Giacomo Indiveri[11], Matthew K. Law[2], Wei Tang[12], Jonathan Tapson[8], Yiming Zhai[10]
[1]Arizona State University, United States; [2]Hong Kong University of Science and Technology, Hong Kong; [3]Imperial College London, United Kingdom; [4]IMSE-CNM, CSIC and Universidad de Sevilla, Spain; [5]Johns Hopkins University, United States; [6]Nanyang Technological University, Singapore; [7]University of California, San Diego, United States; [8]University of Cape Town, South Africa; [9]University of Manchester, United Kingdom; [10]University of Maryland, United States; [11]University of Zurich/ETH Zurich, Switzerland; [12]Yale University, United States

B1L-D: Arithmetic Circuits I

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: EL PARDO II
Chair(s): Oscar Gustafsson, *Linkoping University*
Lan-Da Van, *National Chiao Tung University*

B1L-D.1 **A Simple Radix-4 Booth Encoded Modulo 2^n+1 Multiplier 1163**
Ramya Muralidharan, Chip Hong Chang
Nanyang Technological University, Singapore

B1L-D.2 **A RNS Montgomery Multiplication Architecture 1167**
Dimitris Schinianakis, Thanos Stouraitis
University of Patras, Greece

B1L-D.3 **A Low-Energy Hybrid Radix-4/-8 Multiplier for Portable Multimedia Applications 1171**
Gyeonghoon Kim, Seungjin Lee, Junyoung Park, Hoi-Jun Yoo
Korea Advanced Institute of Science and Technology, Korea, South

B1L-D.4 **A 145μW 8×8 Parallel Multiplier Based on Optimized Bypassing Architecture 1175**
Sunjoo Hong, Taehwan Roh, Hoi-Jun Yoo
Korea Advanced Institute of Science and Technology, Korea, South

B1L-D.5 **A Recursive-Divide Architecture for Multiplication and Division 1179**
James Stine, Amey Phadke, Surpriya Tike
Oklahoma State University, United States

B1L-E: Design, Project & Learning Technology Innovations in Circuits, Signals & Systems Education

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: ORIENTE
Chair(s): Tokunbo Ogunfunmi, *Santa Clara University California*
Joos Vandewalle, *Katholieke Universiteit Leuven*

B1L-E.1 **Learning to Conceive, Design, Implement and Operate Circuits and Systems 1183**
Eduard Alarcón, Ramon Bragós, Elisa Sayrol
Universitat Politècnica de Catalunya BarcelonaTech, Spain

B1L-E.2 **Teaching Circuits to New Generations of Engineers 1187**
Ljiljana Trajkovic
Simon Fraser University, Canada

B1L-E.3 **An Online Adaptive Tutoring System for Design-Centric Courses 1191**
Yong Lian
National University of Singapore, Singapore

B1L-E.4 **Circuits and Systems Engineering Education Through Interdisciplinary Team-Based Design Projects 1195**
Wim Dehaene[1], Georges Gielen[2], Geert Deconinck[1], Johan Driesen[1], Marc Moonen[1], Bart Nauwelaers[1], C. Van Hoof[1], Patrick Wambacq[1]
[1]Katholieke Universiteit Leuven, Belgium; [2]Katholieke Universiteit Leuven / ESAT-MICAS, Belgium

B1L-E.5 **An Introductory Capstone Design Course on Embedded Systems 1199**
Jeff Jensen[1], Edward Lee[2], Sanjit Seshia[2]
[1]National Instruments, United States; [2]University of California, Berkeley, United States

B1L-F: Physical Design & Clock Synthesis

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: IMPERIAL I
Chair: Miroslav Velev, *Aries Design Automation*

B1L-F.1 **Floorplanning Driven Network-on-Chip Synthesis for 3-D SoCs 1203**
Wei Zhong, Song Chen, Fei Ma, Takeshi Yoshimura, Satoshi Goto
Waseda University, Japan

B1L-F.2 **A Unified Optimization Framework for Simultaneous Gate Sizing and Placement Under Density Constraints 1207**
Jason Cong, John Lee, Guojie Luo
University of California, Los Angeles, United States

B1L-F.3 **A Hierarchical 3-D Floorplanning Algorithm for Many-Core CMP Networks 1211**
Sachhidh Kannan, Garrett S. Rose
Polytechnic Institute of New York University, United States

B1L-F.4 **Distributed LC Resonant Clock Tree Synthesis 1215**
Matthew Guthaus
University of California, Santa Cruz, United States

B1L-F.5 **Register on MEsh (ROME): a Novel Approach for Clock Mesh Network Synthesis 1219**
Jianchao Lu[1], Yusuf Aksehir[2], Baris Taskin[1]
[1]Drexel University, United States; [2]Sabanci University, Turkey

B1L-G: Multimedia Compression & Quality

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: ALVORADA I
Chair(s): Gwo-Giun Lee, *National Cheng Kung University*
Ching-Yung Lin, *IBM*

B1L-G.1 **Reconfigurable Inverse Transform Architecture for Multiple Purpose Video Coding 1223**
Tsung-Yuan Huang, He-Yuan Lin, Chen-Fu Chen, Gwo Giun Lee
National Cheng Kung University, Taiwan

B1L-G.2 **A Learning-Based Video Compression on Low-Quality Data by Unscented Kalman Filters with Gaussian Process Regression 1227**
Hongkai Xiong[2], Zhe Yuan[2], Yuan F. Zheng[1]
[1]Ohio State University, United States; [2]Shanghai Jiao Tong University, China

B1L-G.3 **Frame-Level Quantization Control for Perceptual Quality Constrained H.264/AVC Video Coding 1231**
Zhenzhong Chen, Yap-Peng Tan
Nanyang Technological University, Singapore

B1L-G.4 **Blind PSNR Estimation Using Shifted Blocks for JPEG Images 1235**
Gao Yang, Yap-Peng Tan
Nanyang Technological University, Singapore

B1L-G.5 **Estimating Relative Objective Quality Among Images Compressed from the Same Original 1239**
Gao Yang[1], Ci Wang[2], Yap-Peng Tan[1]
[1]Nanyang Technological University, Singapore; [2]Shanghai Jiao Tong University, China

B1L-H: DSP Implementation

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: ALVORADA II
Chair(s): Yoshikazu Miyanaga, *Hokkaido University*
Tokunbo Ogunfunmi, *Santa Clara University California*

B1L-H.1 **Roesser Model Realization of MIMO n-D Systems by Elementary Operations 1243**
Li Xu[1], Shi Yan[2], Shin-Ya Matsushita[1], Zhiping Lin[3]
[1]Akita Prefectural University, Japan; [2]Lanzhou University, China; [3]Nanyang Technological University, Singapore

B1L-H.2 **Algebraic Integer Based 8×8 2-D DCT Architecture for Digital Video Processing.....1247**
Arjuna Madanayake[2], Renato Cintra[1], Denis Onen[3], Vassil Dimitrov[3], Leonard Bruton[3]
[1]Universidade Federal de Pernambuco, Brazil; [2]University of Akron, United States; [3]University of Calgary, Canada

B1L-H.3 **Clock Jitter Estimation in Noise 1251**
Zaid Towfic, Ali H. Sayed
University of California, Los Angeles, United States

B1L-H.4 **FPGA Implementation of an ASIP for High Throughput DFT/DCT 1D/2D Engine 1255**
Hanan M. Hassan, Ahmed F. Shalash, Karim Mohamed
Cairo University, Egypt

B1L-H.5 **A High-Speed Low-Complexity Modified Radix-2^5 FFT Processor for Gigabit WPAN Applications.....1259**
Taesang Cho[1], Hanho Lee[1], Jounsup Park[2], Chulgyun Park[2]
[1]Inha University, Korea, South; [2]Samsung Electronics Co. LTD., Korea, South

B1L-J: Recent Advances in Linear & Non-Linear Adaptive Filters

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: ITAMARATY I
Chair: Tokunbo Ogunfunmi, *Santa Clara University California*

B1L-J.1 **On the Complex Kernel-Based Adaptive Filter 1263**
Tokunbo Ogunfunmi, Thomas Paul
Santa Clara University, United States

B1L-J.2 **Adaptive Identification of Sparse Systems with Variable Sparsity 1267**
Bijit Das[2], Mrityunjoy Chakraborty[2], Soumitro Banerjee[1]
[1]Indian Institute of Science Education & Research-Kolkata, India; [2]Indian Institute of Technology, Kharagpur, India

B1L-J.3 **Fault Tolerant Adaptive Filters Based on Modified Discrete Fourier Transform Architectures 1271**
Chandrasekhar Radhakrishnan, William Jenkins
Pennsylvania State University, United States

B1L-J.4 **Digital Post-Linearization of a Wideband Low Noise Amplifier for Ultra-Wideband Wireless Receivers 1275**
Ifiok Umoh, Tokunbo Ogunfunmi
Santa Clara University, United States

B1L-J.5 **Sub-Channel Equalizer Design Based on Geometric Interpolation for FBMC/OQAM Systems 1279**
Carlos Aurélio Faria Da Rocha[2], Maurice Bellanger[1]
[1]Conservatoire National des Arts et Métiers, France; [2]Universidade Federal de Santa Catarina, Brazil

B1L-K: UWB Circuits & Systems I

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: SEGOVIA I
Chair: Wei Xing, *University of Western Sydney*

B1L-K.1 **A 24 GHz Quadrature Pulsed Oscillator for Short-Range UWB Vehicular Radar Applications 1283**
Ahmed El-Gabaly, Carlos Saavedra
Queen's University, Canada

B1L-K.2 **Reduced-Size Ultra-Wideband True-Time-Delay Beam-Forming Receivers 1287**
Ahmed Helmy, Kamran Entesari
Texas A&M University, College Station, United States

B1L-K.3 **A 2-6GHz Broadband CMOS Low-Noise Amplifier with Current Reuse Topology Utilizing a Noise-Shaping Technique 1291**
Wei-Hsiang Hung, Kuan-Ting Lin, Jian-Yu Hsieh, Shey-Shi Lu
National Taiwan University, Taiwan

B1L-K.4 **A Non-Coherent FSK-OOK UWB Impulse Radio Transmitter for Clock-Less Synchronization 1295**
Wei Tang, Eugenio Culurciello
Yale University, United States

B1L-K.5 **A 5.2 pJ/Pulse Impulse Radio Pulse Generator in 90 nm CMOS 1299**
Kin Keung Lee, Malihe Zarre Dooghabadi, Håkon A. Hjortland, Øivind Næss, Tor Sverre Lande
University of Oslo, Norway

B1L-L: Low-Density Parity-Check Decoder Design

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: SEGOVIA II
Chair: Yajun Ha, *University of Singapore*

B1L-L.1 **Low-Complexity Architectures for Reliability-Based Message-Passing Non-Binary LDPC Decoding 1303**
Xinmiao Zhang, Fang Cai
Case Western Reserve University, United States

B1L-L.2 **Sliding Window Method for Stochastic LDPC Decoder 1307**
Jienan Chen, Jianhao Hu
Science and Technology on Communications University of Electronic Science and Technology of China, China

B1L-L.3 **A High-Throughput LDPC Decoder Architecture for High-Rate WPAN Systems 1311**
Kyung-Il Baek[1], Hanho Lee[1], Chang-Seok Choi[1], Sangmin Kim[2], Gerald E. Sobelman[2]
[1]Inha University, Korea, South; [2]University of Minnesota, United States

B1L-L.4 **An Adaptive Analog Low-Density Parity-Check Decoder Based on Margin Propagation 1315**
Ming Gu, Shantanu Chakrabartty
Michigan State University, United States

B1L-L.5 **QC-LDPC Decoding Architecture Based on Stride Scheduling 1319**
Bongjin Kim, In-Cheol Park
Korea Advanced Institute of Science and Technology, Korea, South

B1L-M: Bifurcation and Chaos

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: SEGOVIA III
Chair(s): Yoshifumi Nishio, *The University of Tokushima*
Gianluca Setti, *University of Ferrara*

B1L-M.1 **Bifurcation and Basin in Two Coupled Parametrically Forced Logistic Maps 1323**
Hironori Kumeno[1], Yoshifumi Nishio[1], Daniele Fournier-Prunaret[2]
[1]Tokushima University, Japan; [2]Universite de Toulouse, France

B1L-M.2 **Symmetry-Breaking Bifurcation in Load Resonant DC-DC Converters 1327**
Kuntal Mandal[2], Soumitro Banerjee[1], Chandan Chakraborty[2]
[1]Indian Institute of Science Education & Research-Kolkata, India; [2]Indian Institute of Technology, Kharagpur, India

B1L-M.3 **Resonate and Fire Dynamics in Complex Oscillation Based Test of Analog Filters 1331**
Sergio Callegari[2], Fabio Pareschi[1], Gianluca Setti[1], Mani Soma[3]
[1]Università degli Studi di Catania, Italy; [2]Università di Bologna, Italy; [3]University of Washington, United States

B1L-M.4 **Design of Grid Multi-Wing Butterfly Chaotic Attractors from Piecewise Lü System Based on Switching Control and Heteroclinic Orbit 1335**
Simin Yu[3], Jinhu Lü[1], Guanrong Chen[2], Xinghuo Yu[4]
[1]Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China; [2]City University of Hong Kong, China; [3]College of Automation, Guangdong University of Technology, China; [4]RMIT University, Australia

B1L-M.5 **On Rigorous Integration of Piece-Wise Linear Continuous Systems 1339**
Zbigniew Galias
AGH University of Science and Technology, Poland

B1L-N: Integrated Power Converters & Energy Harvesting

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: SEGOVIA IV
Chair(s): Tsorng Juu Liang, *National Cheng Kung University*
Gabriel Rincón-Mora, *Georgia Institute of Technology*

B1L-N.1 **Electrostatic Vibration Energy Harvester with Piezoelectric Start-Up Generator 1343**
Hélder Florentino[1], Raimundo Freire[1], Alan Sá[1], Caio Florentino[1], Dimitri Galayko[2]
[1]Universidade Federal de Campina Grande, Brazil; [2]UPMC Sorbonne Universités / LIP6, France

B1L-N.2 **Design and Modeling of an Underwater Energy Harvesting System .....NA**
Jianwei Dai, Xiang Li, Baikun Li, Lei Wang
University of Connecticut, United States

B1L-N.3 **Switched Capacitor DC-DC Converter in 65nm CMOS Technology with a Peak Efficiency of 97%.....1351**
Thomas Santa[2], Mario Auer[1], Christoph Sandner[2], Christian Lindholm[2]
[1]Graz University of Technology Austria AG, Austria; [2]Infineon Technologies Austria AG, Sweden

B1L-N.4 **Switched-Capacitor Based Step-Up Converter for Alternative Energy Applications ...1355**
Qingquan Tang[2], Bo Li[2], Dariusz Czarkowski[2], Adrian Ioinovici[1]
[1]Holon Institute of Technology, Israel; [2]Polytechnic Institute of New York University, United States

B1L-N.5 **EMC Influence of the Charge Pump in Linear Regulators – Design, Simulation and Measurements 1359**
Juergen Wittmann[2], Bernhard Wicht[1]
[1]Reutlingen University, Germany; [2]Texas Instruments Germany, Germany

B2L-A: Delta-Sigma Modulator

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: ALHAMBRA I
Chair: Joao Goes, *UNINOVA*

B2L-A.1 **A Novel Implementation of Dithered Digital Delta-Sigma Modulators via Bus-Splitting 1363**
Brian Fitzgibbon[2], Michael Peter Kennedy[2], Franco Maloberti[1]
[1]Università degli studi di Pavia, Italy; [2]University College Cork, Ireland

B2L-A.2 **A Second-Order Switched-Capacitor Delta Sigma Modulator Using Very Incomplete Settling 1367**
Blazej Nowacki[2], Nuno Paulino[1], João Goes[1]
[1]UNINOVA/CTS - DEE FCT/UNL, Portugal; [2]UNINOVA/DEE/FCT/UNL, Portugal

B2L-A.3 **A Low-Power Third-Order Sigma-Delta Modulator Using a Single Operational Amplifier 1371**
Aldo Peña Perez, Edoardo Bonizzoni, Franco Maloberti
Università degli studi di Pavia, Italy

B2L-A.4 **A 400 MHz Delta-Sigma Modulator for Bandpass IF Digitization Around 100 MHz with Excess Loop Delay Compensation 1375**
Akhil Gupta, Shahrokh Ahmadi, Mona Zaghloul
George Washington University, United States

B2L-A.5 **Generalized Multi-Stage Closed Loop Sigma Delta Modulator 1379**
Van Tam Nguyen[2], Hussein Fakhoury[2], Patrick Loumeau[2], Philippe Benabes[1]
[1]Supélec, France; [2]Telecom ParisTech, France

B2L-B: Analog Filtering & Signal Processing

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: ALHAMBRA II
Chair: Viktor Gruev, *Washington University*

B2L-B.1 **Adaptation Algorithms for a Class of Continuous Time Analog Equalizers with Application to Serial Links 1383**
Pervez Aziz, Amaresh Malipatil
LSI Corporation, United States

B2L-B.2 **A 5s-Time-Constant Temperature-Stable Integrator for a Tuneable PID Controller in LOC Applications 1387**
Yuanqi Hu, Yan Liu, Timothy Constandinou, Christofer Toumazou
Imperial College London, United Kingdom

B2L-B.3 **Electronic Time Stretching for Fast Digitization 1391**
Nagendra Krishnapura
Indian Institute of Technology, Madras, India

B2L-B.4 **Integrated Multi-Tap Transformer for Reconfigurable Multimode Matching Networks 1395**
Xiaohua Yu, Nathan Neihart
Iowa State University, United States

B2L-B.5 **A High Linear Low Flicker Noise 25% Duty Cycle LO I/Q Mixer for a FM Radio Receiver 1399**
Jae-Seung Lee, Chang-Jin Jeong, Yeong-Shin Jang, In-Young Lee, Sang-Sung Lee, Sok-Kyun Han, Sang-Gug Lee
Korea Advanced Institute of Science and Technology, Korea, South

B2L-C: Noise Immunity & ESD

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: EL PARDO I
Chair(s): Massimo Alioto, *University of Siena*
Mohamed Elgamel, *University of Louisiana at Lafayette*

B2L-C.1 **Design of Power-Rail ESD Clamp Circuit with Adjustable Holding Voltage Against Mis-Trigger or Transient-Induced Latch-On Events 1403**
Chih-Ting Yeh[1], Yung-Chih Liang[1], Ming-Dou Ker[2]
[1]Industrial Technology Research Institute, Taiwan; [2]National Chiao-Tung University, Taiwan

B2L-C.2 **Addressing Crosstalk Issue in on-Chip Carbon Nanotube Interconnects Using Negative Capacitance 1407**
Md. Khaled Hassan, Md. Sajjad Rahaman, Masud Chowdhury
University of Illinois at Chicago, United States

B2L-C.3 **Noise Coupling Due to Through Silicon Vias (TSVs) in 3-D Integrated Circuits 1411**
Emre Salman
Stony Brook University, United States

B2L-C.4 **A Low Noise, Fast Pixel Readout IC Working in Single Photon Counting Mode with Energy Window Selection in 90 nm CMOS 1415**
Robert Szczygiel, Pawel Grybos, Piotr Maj
AGH University of Science and Technology, Poland

B2L-C.5 **A 12Gbps All Digital Low Power SerDes Transceiver for on-Chip Networking 1419**
Sally Safwat[2], Ezz El-Din Hussein[2], Maged Ghoneima[2], Yehea Ismail[1]
[1]Northwestern University, United States; [2]Northwestern University / Nile University, Egypt

B2L-D: Arithmetic Circuits II

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: EL PARDO II
Chair(s): Izzet Kale, *University of Westminster*
Vojin G. Oklobdzija, *University of Texas*

B2L-D.1 **A 1.2V 6.4GHz 181ps 64-Bit CD Domino Adder with DLL Measurement Technique.....1423**
Yushun Wang, Min-Han Hsieh, Chia-Ming Liu, Yi-Chi Wu, Bing-Feng Lin, Hsien-Chen Chiu, Charlie Chung-Ping Chen
National Taiwan University, Taiwan

B2L-D.2 **Desynchronize a Legacy Floating-Point Adder with Operand-Dependant Delay Elements 1427**
Jun Xu, Hong Wang
Institute of Computing Technology / Chinese Academy of Science, China

B2L-D.3 **A New RNS Scaler for {2^n-1, 2^n, 2^n +1} 1431**
Jeremy Yung Shern Low, Chip Hong Chang
Nanyang Technological University, Singapore

B2L-D.4 **Design of Multi-Residue Generators Using Shared Logic 1435**
Stanislaw Piestrak
IRISA/INRIA, France

B2L-D.5 **Minimum Adder Depth Multiple Constant Multiplication Algorithm for Low Power FIR Filters.....1439**
Kenny Johansson[1], Oscar Gustafsson[3], Linda Debrunner[2], Lars Wanhammar[3]
[1]Airborne Hydrography AB, Sweden; [2]Florida State University, United States; [3]Linköping University, Sweden

B2L-E: Circuits for Biomedical Systems I

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: ORIENTE
Chair: Timothy G. Constandinou, *Imperial College London*

B2L-E.1 **0.5V Wavelet Filters Using Current Mirrors 1443**
Costas Laoudias, Costas Beis, Costas Psychalinos
University of Patras, Greece

B2L-E.2 **Ultra-Low Power Self-Calibrating BPSK Demodulator for Bio-Implantable Chips..... NA**
Ghazal Nabovati, Seyed Abdollah Mirbozorgi, Mohammad Maymandi-Nejad
Ferdowsi University of Mashhad, Iran

B2L-E.3 **A 16-Channel Low-Noise Programmable System for the Recording of Neural Signals..... 1451**
Carolina Mora López[1], Dries Braeken[1], Carmen Bartic[2], Robert Puers[2], Georges Gielen[3], Wolfgang Eberle[1]
[1]IMEC, Belgium; [2]Katholieke Universiteit Leuven, Belgium; [3]Katholieke Universiteit Leuven / ESAT-MICAS, Belgium

B2L-E.4 **A 0.6V CMOS Image Sensor with in-Pixel Biphasic Current Driver for Biomedical Application..... 1455**
Chinlin Lee, Chih-Cheng Hsieh
National Tsing Hua University, Taiwan

B2L-E.5 **Design of Widely Tunable Mexican Hat Wavelet Filter for Cardiac Signal Analysis..... 1459**
Amandeep Singh[2], Refet Firat Yazicioglu[1], Chris Van Hoof[1]
[1]IMEC, Belgium; [2]Texas A&M University, College Station, United States

B2L-F: Circuit Simulation & Testing

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: IMPERIAL I
Chair: Garrett Rose, *New York University*

B2L-F.1 **Early Case Splitting and False Path Detection to Improve High Level ATPG Techniques 1463**
Bijan Alizadeh, Masahiro Fujita
University of Tokyo, Japan

B2L-F.2 **A Fast and Stable Explicit Integration Method by Matrix Exponential Operator for Large Scale Circuit Simulation 1467**
Shih-Hung Weng, Peng Du, Chung-Kuan Cheng
University of California, San Diego, United States

B2L-F.3 **Novel Simulation Approach for 3G W-CDMA Receivers 1471**
Mazen Abi-Hussein, Corinne Berland, Olivier Venard
ESIEE-Université Paris, France

B2L-F.4 **A Heuristic Algorithm for Reducing System-Level Test Vectors with High Branch Coverage 1475**
Koji Yamazaki, Yusuke Sekihara, Takashi Aoki, Eiichi Hosoya, Akira Onozawa
NTT Microsystem Integration Laboratories, Japan

B2L-F.5 **CNF Encodings of Cardinality in Formal Methods for Robustness Checking of Gate-Level Circuits 1479**
Miroslav Velev, Ping Gao
Aries Design Automation, United States

B2L-G: Design & Implementation of Multimedia Systems

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: ALVORADA I
Chair(s): Yen-Kuang Chen, *Intel Corp*
Yap-Peng Tan, *Nanyang Technological University*

B2L-G.1 **Performance Evaluation of JPEG2000 Implementation on VLIW Cores, SIMD Cores and Multi-Cores 1483**
Francesco Menichelli, Mauro Olivieri, Simone Smorfa
Università degli studi di Roma La Sapienza, Italy

B2L-G.2 **Effective Multi-Standard Macroblock Prediction VLSI Design for Reconfigurable Multimedia Systems 1487**
Yuliang Tao, Guanghui He, Weifeng He, Qin Wang, Jun Ma, Zhigang Mao
Shanghai Jiao Tong University, China

B2L-G.3 **A Parallel Architecture for Ray-Tracing with an Embedded Intersection Algorithm 1491**
Alexandre Nery[3], Nadia Nedjah[2], Felipe França[3], Lech Jozwiak[1]
[1]Technische Universiteit Eindhoven, Netherlands; [2]Universidade do Estado do Rio de Janeiro, Brazil; [3]Universidade Federal do Rio de Janeiro, Brazil

B2L-G.4 **Sub-Pixel Downsampling of Video with Matching Highly Data Re-use Hardware Architecture 1495**
Xing Wen, Oscar Au, Jiang Xu, Lu Fang, Run Cha
Hong Kong University of Science and Technology, Hong Kong

B2L-G.5 **Predictive Dynamic Frequency Scaling for Multi-Processor Systems-on-Chip 1500**
Gabriel Marchesan Almeida[1], Rémi Busseuil[1], Everton Alceu Carara[2], Nicolas Hébert[3], Sameer Varyani[1], Gilles Sassatelli[1], Pascal Benoit[1], Lionel Torres[1], Fernando Gehm Moraes[2]
[1]Laboratory of Informatics, Robotics and Microelectronics of Montpellier, LIRMM, France; [2]Pontifícia Universidade do Rio Grande do Sul, Brazil; [3]STMicroelectronics/LIRMM, France

B2L-H: Discrete Transforms

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: ALVORADA II
Chair(s): Tapio Saramäki, *Tampere University of Technology*
David Tay, *La Trobe University*

B2L-H.1 **Orthonormal Eigenvectors of the DFT-IV Matrix by the Eigenanalysis of a Nearly Tridiagonal Matrix 1504**
Magdy Hanna
Fayoum University, Egypt

B2L-H.2 **The 2-D Modulated Discrete Fourier Transform for 2-D Fast Convolution and Digital Filtering 1508**
Chandrasekhar Radhakrishnan, William Jenkins
Pennsylvania State University, United States

B2L-H.3 **Filterbank-Based Fast Parallel Algorithms for 2-D DHT-Based Real-Valued Discrete Gabor Transform 1512**
Liang Tao[1], Hon Keung Kwan[3], Juan-Juan Gu[2]
[1]Anhui University, China; [2]Hefei University, China; [3]University of Windsor, Canada

B2L-H.4 **An Efficient Algorithm for the Conjugate Symmetric Sequency-Ordered Complex Hadamard Transform 1516**
Saad Bouguezel, M. Omair Ahmad, M.N.S. Swamy
Concordia University, Canada

B2L-H.5 **Jacket Haar Transform 1520**
Jian-Jiun Ding, Soo-Chang Pei, Po-Hong Wu
National Taiwan University, Taiwan

B2L-J: Applications and Methodologies for Many-core Platforms

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: ITAMARATY I
Chair(s): Chai Wah Wu, *IBM T. J. Watson Research Center*
Akos Zarandy, *Hungarian Academy of Sciences*

B2L-J.1 **Emerging Applications for Multi/Many-Core Processors 1524**
Victor Lee, Yen-Kuang Chen, Pradeep Debuy
Intel Corporation, United States

B2L-J.2 **GPU-Enabled Parallel Processing for Image Halftoning Applications 1528**
Barry Trager[1], Chai Wah Wu[1], Mikel Stanich[2], Kartheek Chandu[2]
[1]IBM T. J. Watson Research Center, United States; [2]Infoprint Solutions Company, United States

B2L-J.3 **A Highly-Integrated Biomedical Multiprocessor System for Portable Brain-Heart Monitoring 1532**
Ericson Chua[1], Wai-Chi Fang[1], Chiu-Kuo Chen[2], Chih-Chung Fu[1], Shao-Yen Tseng[1], Shih Kang[1], Zong-Han Hsieh[1]
[1]National Chiao Tung University, Taiwan; [2]National Chiao Tung University & Bureau of Standards, Metrology and Inspection Ministry of Economic, Taiwan

B2L-J.4 **Applications of the Virtual Cellular Machine to Many-Core Processors 1536**
Tamás Roska, Akos Zarándy, Giovanni Egidio Pazienza
MTA-SZTAKI & Pázmány Péter Catholic University, Hungary

B2L-K: UWB Circuits & Systems II

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: SEGOVIA I
Chair: Lan-Da Van, *National Chiao Tung University*

B2L-K.1 **UWB Beamforming Architecture for RTLS Applications Using Digital Phase-Shifters 1540**
Farid Bautista, Dominique Morche, François Dehmas, Guilles Masson
CEA, LETI, Minatec, France

B2L-K.2 **A Harmonic-Suppressed Regenerative Divide-by-5 Frequency Divider for UWB Applications 1544**
Haipeng Fu, Deyun Cai, Junyan Ren, Wei Li
Fudan University, China

B2L-K.3 **An Integrated Beamformer for IR-UWB Receiver in 0.18-µm CMOS 1548**
Yuan Gao[1], Yuanjin Zheng[2], Shengxi Diao[1], Yao Zhu[2], Chun-Huat Heng[3]
[1]Institute of Microelectronics, A-STAR, Singapore; [2]Nanyang Technological University, Singapore; [3]National University of Singapore, Singapore

B2L-K.4 **Analog Front-End RX Design for UWB Impulse Radio in 90nm CMOS 1552**
David Sarmiento Mendoza, Zhuo Zou, Qin Zhou, Jia Mao, Peng Wang, Fredrik Jonsson, Li-Rong Zheng
Royal Institute of Technology, Sweden

B2L-K.5 **A 3.1-8 GHz CMOS UWB Front-End Receiver 1556**
Ali Meaamar, Chirn Chye Boon, Xiaomeng Shi, Wei Meng Lim, Kiat Seng Yeo, Manh Anh Do
Nanyang Technological University, Singapore

B2L-L: Imagers I

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: SEGOVIA II
Chair(s): Amine Bermak, *Hong Kong University of Science & Technology*
Bernabe Linares-Barranco, *IMSE-CNM-CSIC*

B2L-L.1 **A Wide Dynamic Range CMOS Image Sensor with the Optimum Photoresponse Per Pixel 1560**
Dipayan Das, Hereward J. Mills, Stephen Collins
University of Oxford, United Kingdom

B2L-L.2 **A Processor Element for a Mixed Signal Cellular Processor Array Vision Chip 1564**
Stephen Carey, Alexey Lopich, Piotr Dudek
University of Manchester, United Kingdom

B2L-L.3 **A 3-Pin 1V 115µW 176×144 Autonomous Active Pixel Image Sensor in 0.18µm CMOS 1568**
Joseph Lin[1], Recep Özgün[1], Philippe Pouliquen[1], Andreas Andreou[1], Charalambos Andreou[2], Julius Georgiou[2]
[1]Johns Hopkins University, United States; [2]University of Cyprus, Cyprus

B2L-L.4 **Sensitivity and Uniformity of a 0.18µm CMOS Temporal Contrast Pixel Array 1572**
Christoph Posch, Daniel Matolin
AIT Austrian Institute of Technology, Austria

B2L-L.5 **Optical Characterization of a Polarization Imager 1576**
Timothy York, Viktor Gruev
Washington University in St. Louis, United States

B2L-M: Complex Networks & Communications

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: SEGOVIA III
Chair(s): Ljiljana Trajkovic, *Simon Fraser University*
Wei Xing Zheng, *University of Western Sydney*

B2L-M.1 **Performance Analysis of Differential Chaotic Shift Keying Communications in MIMO Systems 1580**
Georges Kaddoum[2], Mai Vu[3], Francois Gagnon[1]
[1]Lacime Laboratory, Canada; [2]LACIME Laboratory / École de Technologie Supérieure, Canada; [3]McGill university, Canada

B2L-M.2 **Improving the Computer Network Intrusion Detection Performance Using the Relevance Vector Machine with Chebyshev Chaotic Map 1584**
Di He
Shanghai Jiao Tong University, China

B2L-M.3 **Efficient Attack Strategy to Communication Networks with Partial Degree Information 1588**
Yongxiang Xia[2], Jin Fan[1]
[1]Donghua University, China; [2]Zhejiang University, China

B2L-M.4 **Roles of Betweenness in Controlling Catastrophic Cascading Failures on Scale-Free Networks 1592**
Xun Li, Xiang Li
Fudan University, China

B2L-M.5 **A Study of Synchronization of Complex Networks via Pinning Control 1596**
Jiahu Qin[1], Wei Xing Zheng[2], Huijun Gao[1]
[1]Harbin Institute of Technology, China; [2]University of Western Sydney, Australia

B2L-N: Modeling & Control of Power Converter

Time: Tuesday, May 17, 2011, 13:40 - 15:20
Room: SEGOVIA IV
Chair(s): Eduard Alarcon, *Universitat Politècnica de Catalunya*
C K Micheal Tse, *The Hong Kong Polytechnic University*

B2L-N.1 **Small-Signal Modeling of PWM Z-Source Converter by Circuit-Averaging Technique 1600**
Veda Prakash Galigekere, Marian Kazimierczuk
Wright State University, United States

B2L-N.2 **Fixed-Frequency Pseudo Sliding Mode Control for a Buck-Boost DC-DC Converter in Mobile Applications: a Comparison with a Linear PID Controller 1604**
Matteo Agostinelli[2], Robert Priewasser[2], Stefano Marsili[1], Mario Huemer[2]
[1]Infineon Technologies Austria AG, Austria; [2]Klagenfurt University, Austria

B2L-N.3 **Discrete-Time H-Infinity Control of PWM Inverters: Experimental Results Complying with IEC 62040-3 ..... 1608**
Samuel Polato Ribas[1], Vinicius Foletto Montagner[1], Humberto Pinheiro[1], Ricardo Fontoura Oliveira[2]
[1]Universidade Federal de Santa Maria, Brazil; [2]University of Campinas, Brazil

B2L-N.4 **Cross-Regulation-Suppression Control Scheme for CCM Single-Inductor-Dual-Output Buck Converter with Ordered-Power-Distributive Control 1612**
Cheng Huang, Philip K. T. Mok
Hong Kong University of Science and Technology, Hong Kong

B2L-N.5 **Analysis of a High-Voltage-Gain Hybrid Switched-Capacitor Buck Converter 1616**
Song Xiong, Siew-Chong Tan, Siu-Chung Wong
Hong Kong Polytechnic University, Hong Kong

B3L-A: Data Converters

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: ALHAMBRA I
Chair: Joao Goes, *UNINOVA*

B3L-A.1 **Binary Access Memory: an Optimized Lookup Table for Successive Approximation Applications 1620**
Benjamin Hershberg[2], Skyler Weaver[2], Seiji Takeuchi[1], Koichi Hamashita[1], Un-Ku Moon[2]
[1]Asahi Kasei EMD Corporation, Japan; [2]Oregon State University, United States

B3L-A.2 **A Signal-Specific Successive-Approximation Analog-to-Digital Converter 1624**
Hassan Sepehrian, Mehdi Saberi, Reza Lotfi
Ferdowsi University of Mashhad, Iran

B3L-A.3 **Accurate Stability Prediction of Single-Bit Higher-Order Delta-Sigma Modulators for Speech Codecs 1628**
Jaswinder Lota[1], Mohammed Al-Janabi[2], Izzet Kale[2]
[1]University of East London, United Kingdom; [2]University of Westminster, United Kingdom

B3L-A.4 **An Online Fully-Digital Calibration of Leakage Noise in MASH Continuous Time Delta-Sigma Modulators 1632**
Sudharsan Kanagaraj, Bahar Jalali Farahani
Arizona State University, United States

B3L-A.5 **Sensitivity Analysis of Pulse-Width Jitter Induced Noise in Continuous-Time Delta-Sigma Modulators to Out-of-Band Blockers in Wireless Receivers 1636**
Ramy Saad, Sebastian Hoyos
Texas A&M University, College Station, United States

B3L-B: Analog Filtering Circuits and Techniques

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: ALHAMBRA II
Chair: Wouter Serdijn, *Delft University of Technology*

B3L-B.1 **A 0.47mW 6th-Order 20MHz Active Filter Using Highly Power-Efficient Opamp 1640**
Le Ye, Congyin Shi, Huailin Liao, Ru Huang
Peking University, China

B3L-B.2 **A 4th-Order 84dB-DR CMOS-90nm Low-Pass Filter for WLAN Receivers..... 1644**
Marcello De Matteis[2], Alessandro Pezzotta[1], Andrea Baschirotto[1]
[1]Università degli Studi di Milano-Bicocca, Italy; [2]Università del Salento, Italy

B3L-B.3 **Synthesis of Linear-Phase Selective Filters Based on Maximum of Time-Domain Response 1648**
Mladen Vucic[2], Goran Molnar[2], Sasa Djukic[1]
[1]TDR d.o.o., Croatia; [2]University of Zagreb, Croatia

B3L-B.4 **Analog 2D Fan Filters from Discrete Domain Transfer Functions 1652**
Arjuna Madanayake[1], Leonid Belostotski[2], Chamith Wijenayake[1], Leonard Bruton[2]
[1]University of Akron, United States; [2]University of Calgary, Canada

B3L-B.5 **A Novel Reconfigurable Alias Interference Cancellation Technique for a-to-D Conversion..... 1656**
Mansour Rachid, Sudhakar Pamarti, Babak Daneshrad
University of California, Los Angeles, United States

B3L-C: Thermal Issues: Modeling & Design

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: EL PARDO I
Chair(s): Masud H Chowdhury, *University of Illinois at Chicago*
An-Yeu Wu, *National Taiwan University*

B3L-C.1 **Estimation of Thermal Status in Multi-Core Systems 1660**
Simone Corbetta, William Fornaciari
Politecnico di Milano, Italy

B3L-C.2 **Area-Efficient Dynamic Thermal Management Unit Using MDLL with Shared DLL Scheme for Many-Core Processors 1664**
Seungwook Paek, Jiehwan Oh, Sang-Hye Chung, Lee-Sup Kim
Korea Advanced Institute of Science and Technology, Korea, South

B3L-C.3 **A Circuit Implementation for Dynamic Thermal Management Techniques 1668**
Pritesh Vora, Masud Chowdhury
University of Illinois at Chicago, United States

B3L-C.4 **Thermal-Aware Energy Minimization of 3D-Stacked L3 Cache with Error Rate Limitation 1672**
Woojin Yun, Kyungsu Kang, Chong-Min Kyung
Korea Advanced Institute of Science and Technology, Korea, South

B3L-C.5 **Energy-Aware Dynamic Task Mapping for NoC-Based MPSoCs 1676**
Marcelo Mandelli, Luciano Ost, Everton Carara, Guilherme Guindani, Thiago Gouvea, Guilherme Medeiros, Fernando Moraes
Pontifícia Universidade do Rio Grande do Sul, Brazil

B3L-D: VLSI for Communication Systems

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: EL PARDO II
Chair(s): Jun Jin Kong, *Samsung Electronics Co., Ltd.*
Hanho Lee, *Inha University*

B3L-D.1 **Efficient Implementation of Secondary Synchronization Symbol Detection in 3GPP LTE 1680**
Amr Wassal, Ahmed Elsherif
Cairo University, Egypt

B3L-D.2 **High Speed Eight-Parallel Mixed-Radix FFT Processor for OFDM Systems 1684**
Eun Ji Kim, Myung Hoon Sunwoo
Ajou University, Korea, South

B3L-D.3 **VLSI Architecture for a Reconfigurable Spectrally Efficient FDM Baseband Transmitter 1688**
Paul Whatmough[1], Marcus Perrett[2], Safa Isam[2], Izzat Darwazeh[2]
[1]ARM Ltd / University College London, United Kingdom; [2]University College London, United Kingdom

B3L-D.4 **A 12 Gb/s Chip-to-Chip AC Coupled Transceiver 1692**
Yushun Wang, Min-Han Hsieh, Yi-Chi Wu, Chia-Ming Liu, Hsien-Chen Chiu, Bing-Feng Lin, Charlie Chung-Ping Chen
National Taiwan University, Taiwan

B3L-D.5 **Reconfigurable Cell Array for Concurrent Support of Multiple Radio Standards by Flexible Mapping 1696**
Chenxin Zhang, Isael Diaz, Per Andersson, Joachim Neves Rodrigues, Viktor Öwall
Lund University, Sweden

B3L-E: Circuits for Biomedical Systems II

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: ORIENTE
Chair: Ralph Etienne-Cummings, *Johns Hopkins University*

B3L-E.1 **High CMRR Power Efficient Neural Recording Amplifier Architecture 1700**
Pablo Castro, Fernando Silveira
Universidad de la República, Uruguay

B3L-E.2 **A Power Efficient Neural Spike Recording Channel with Data Bandwidth Reduction 1704**
Alberto Rodríguez-Pérez, Jesús Ruiz-Amaya, José Antonio Rodríguez-Rodríguez, Manuel Delgado-Restituto, Ángel Rodríguez-Vázquez
IMSE-CNM, CSIC and Universidad de Sevilla, Spain

B3L-E.3 **A Fully-Adjustable Dynamic Range Capacitance Sensing Circuit in a 0.15µm 3D SOI Process 1708**
Jianan Song, David Welch, Jennifer Blain Christen
Arizona State University, United States

B3L-E.4 **CMOS DAC-Sharing Stimulator for Neural Recording and Stimulation Arrays 1712**
Karim Abdelhalim, Roman Genov
University of Toronto, Canada

B3L-E.5 **A 2.4µW 400nC/s Constant Charge Injector for Wirelessly-Powered Electro-Acupuncture 1716**
Hyungwoo Lee, Kiseok Song, Long Yan, Hoi-Jun Yoo
Korea Advanced Institute of Science and Technology, Korea, South

B3L-F: Circuit Design & Analysis

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: IMPERIAL I
Chair: Masahiro Fujita, *University of Tokyo*

B3L-F.1 **An Approach Based on Edge Coloring of Tripartite Graph for Designing Parallel LDPC Interleaver Architecture** **1720**
Awais Sani, Philippe Coussy, Cyrille Chavet, Eric Martin
Université de Bretagne-Sud, France

B3L-F.2 **Template-Based Layout Retargeting for Analog and RF Integrated Circuits** ..... **NA**
Zheng Liu, Lihong Zhang
Memorial University of Newfoundland, Canada

B3L-F.3 **An Implementation of the Circuit Multiobjective Optimization with the Weighted Sum Strategy and Goal Attainment Method** **1728**
Josef Dobes[2], Jan Michal[1]
[1]CertiCon Corporation, Czech Rep.; [2]Czech Technical University in Prague, Czech Rep.

B3L-F.4 **Analysis of Mean-Square-Error (MSE) for Fixed-Point FFT Units** **1732**
Omid Sarbishei, Katarzyna Radecka
McGill University, Canada

B3L-F.5 **An Efficient Algorithm of Performing Range Analysis for Fixed-Point Arithmetic Circuits Based on SAT Checking** **1736**
Yu Pang[1], Katarzyna Radecka[2]
[1]Chongqing University of Posts and Telecommunications, China; [2]McGill University, Canada

B3L-G: Compressive Sensing & Its Applications

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: ALVORADA I
Chair(s): M.N.S. Swamy, *Concordia University*
Wei-Ping Zhu, *Concordia University*

B3L-G.1 **Unconstrained Regularized Lp-Norm Based Algorithm for the Reconstruction of Sparse Signals 1740**
Jeevan Pant, Wu-Sheng Lu, Andreas Antoniou
University of Victoria, Canada

B3L-G.2 **Real-Time Compressed Sensing-Based Electrocardiogram Compression on Energy-Constrained Wireless Body Sensors 1744**
Hossein Mamaghanian, Nadia Khaled, David Atienza, Pierre Vandergheynst
École Polytechnique Fédérale de Lausanne, Switzerland

B3L-G.3 **Generic Sensing Hardware and Real-Time Reconstruction for Structured Analog Signals 1748**
Moshe Mishali, Rolf Hilgendorf, Eli Shoshan, Ina Rivkin, Yonina Eldar
Technion, Israel

B3L-G.4 **Compressed Sensing for DOA Estimation with Fewer Receivers Than Sensors 1752**
Jian-Feng Gu, Wei-Ping Zhu, M.N.S. Swamy
Concordia University, Canada

B3L-H: Multirate & Filter Banks

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: ALVORADA II
Chair(s): Håkan Johansson, *Linköping University*
David Tay, *La Trobe University*

B3L-H.1 **Generalized 2D Lattice Structure for Causal and Noncausal Modeling of Random Fields 1756**
Ahmet H. Kayran, Erdogan Camcioglu, Ender M. Eksioglu, A. Korhan Tanc, Serhat Seker
Istanbul Technical University, Turkey

B3L-H.2 **Direct Design of Phase Factor in the Common-Factor Technique for Hilbert-Pairs 1760**
David Tay
LaTrobe University, Australia

B3L-H.3 **Assessment of NPR MDFT Filter Banks for Subband Coding and Data Transmission 1764**
Fernando Cruz-Roldán[1], Manuel Blanco-Velasco[1], José Sáez-Landete[1], Conor Heneghan[2], Pedro Amo-López[1]
[1]Universidad de Alcalá, Spain; [2]University College of Dublin, Ireland

B3L-H.4 **A Method to Convert Near-Perfect into Perfect Reconstruction FIR Prototype Filters for Modulated Filter Banks 1768**
Leonardo Baltar, Amine Mezghani, Josef Nossek
Technische Universität München, Germany

B3L-J: VLSI Architectures for LDPC Coding/Decoding

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: ITAMARATY I
Chair(s): Andreas Burg, *ETH Zürich*
Christoph Studer, *ETH Zürich*

B3L-J.1 **Area, Throughput, and Energy-Efficiency Trade-Offs in the VLSI Implementation of LDPC Decoders 1772**
Christoph Roth[2], Alessandro Cevrero[1], Christoph Studer[2], Yusuf Leblebici[1], Andreas Burg[1]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]University of Zurich/ETH Zurich, Switzerland

B3L-J.2 **Multi-Layer Parallel Decoding Algorithm and VLSI Architecture for Quasi-Cyclic LDPC Codes 1776**
Yang Sun, Guohui Wang, Joseph Cavallaro
Rice University, United States

B3L-J.3 **Low Power LDPC Decoder with Efficient Stopping Scheme for Undecodable Blocks 1780**
Tinoosh Mohsenin[2], Houshmand Shirani-Mehr[1], Bevan Baas[1]
[1]University of California, Davis, United States; [2]University of Maryland, Baltimore County, United States

B3L-J.4 **LDPC Decoder Architecture for High-Data Rate Personal-Area Networks 1784**
Matthew Weiner[1], Borivoje Nikolic[1], Zhengya Zhang[2]
[1]University of California, Berkeley, United States; [2]University of Michigan, United States

B3L-J.5 **Hardware Implementation Challenges of Modern Error Control Decoders 1788**
Christian Schlegel[1], Vincent Gaudet[2]
[1]University of Alberta, Canada; [2]University of Waterloo, Canada

B3L-K: High Performance Receiver Design Techniques

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: SEGOVIA I
Chair: Kwen-Siong Chong, *Nanyang Technological University*

B3L-K.1 **Wide Dynamic Range, 0.8 to 6 GHz LNA in 45 nm Digital SOI CMOS 1792**
Jangjoon Lee, Byunghoo Jung
Purdue University, United States

B3L-K.2 **A Low-Power CMOS Current-Reused RF Front-End Receiver with Dual Loop Feedback..... NA**
Jia-Wei Lin[2], Wei-Yi Hu[2], Yi-Pei Su[2], Yong-Hsiang Hsieh[1], Sao-Jie Chen[2]
[1]MuChip Co., Ltd., Taiwan; [2]National Taiwan University, Taiwan

B3L-K.3 **A 1.5 GHz High-Q Receiver Based on Current Reuse..... 1800**
Jianlei Shi, Jagdish Pandey, Brian Otis
University of Washington, United States

B3L-K.4 **A Double Notch RF Filter Architecture for SAW-Less GPS Receivers 1804**
Carsten Barth, Ivan Linscott, Umran Inan
Stanford University, United States

B3L-K.5 **Digital Energy Detection for OOK Demodulation in Ultra-Low Power Radios 1808**
Jesse Richmond, Jan Rabaey
University of California, Berkeley, United States

B3L-L: Imagers II

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: SEGOVIA II
Chair(s): Piotr Dudek, *University of Manchester*
Viktor Gruev, *Washington University*

B3L-L.1 **A Self-Biased PLL-Tuned AER Pixel for High-Speed Infrared Imagers 1812**
Josep Maria Margarit, Michele Dei, Lluís Terés, Francisco Serra-Graells
Instituto de Microelectrónica de Barcelona-CNM(CSIC), Spain

B3L-L.2 **Noise Analysis of a Current-Mode Read Circuit for Sensing Magnetic Tunnel Junction Resistance 1816**
Michael Hall, Viktor Gruev, Roger Chamberlain
Washington University in St. Louis, United States

B3L-L.3 **Dual VDD Block Based CMOS Image Sensor - Preliminary Evaluation 1820**
Qing Gao, Orly Yadid-Pecht
University of Calgary, Canada

B3L-L.4 **A 32×32 Single Photon Avalanche Diode Imager with Delay-Insensitive Address-Event Readout 1824**
Joseph Lin, Andreas Andreou
Johns Hopkins University, United States

B3L-L.5 **Noise Modeling of Stokes Parameters in Division of Focal Plane Polarization Imagers 1828**
Rob Perkins, Viktor Gruev
Washington University in St. Louis, United States

B3L-M: Analysis, Modeling, and Simulations

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: SEGOVIA III
Chair(s): Cem Goknar, *Dogus University*
Hiroo Sekiya, *Chiba University*

B3L-M.1 **SPICE Modeling of Memristors 1832**
Hisham Abdalla, Matthew Pickett
Hewlett-Packard, United States

B3L-M.2 **Modeling and Analysis of Nonlinearities and Bandwidth Limitations in RF Receivers 1836**
Erwin Janssen, Dusan Milosevic, Peter Baltus, Hooman Habibi
Technische Universiteit Eindhoven, Netherlands

B3L-M.3 **Nonlinear Behavior of Electrostatic Discharge Protection Structures Under High-Power Microwave Excitation: Modeling and Simulation 1840**
Zeynep Dilli, Akin Akturk, Neil Goldsman, Michael Holloway, John Rodgers
University of Maryland, United States

B3L-M.4 **A New Approach for Electrothermal Analysis of Electronic Circuits 1844**
Farah Mohammadi, Farnoos Farrokhi Farkhani, Shazzat Hossain
Ryerson University, Canada

B3L-M.5 **A Novel Optimization Method for CT Sigma-Delta-Modulators Using a Switched System Model 1848**
Christoph Zorn[1], Sebastian Stegemann[1], Timon Brückner[2], Maurits Ortmanns[2], Wolfgang Mathis[1]
[1]Leibniz University of Hanover, Germany; [2]Universität Ulm, Germany

B3L-N: Power System & Motor Driver

Time: Tuesday, May 17, 2011, 15:40 - 17:20
Room: SEGOVIA IV
Chair(s): Hsiao-Dong Chiang, *Cornell University*
Juri Jatskevich, *University of British Columbia*

B3L-N.1 **Hybrid Intelligent System for Daily Maximum Temperature Forecasting in Smart Grids 1852**
Hiroyuki Mori, Akira Takahashi
Meiji University, Japan

B3L-N.2 **A Fast Method for Islanding Analysis in Power System Grids 1856**
Edson Aparecido Rozas Theodoro, Raphael Augusto de Souza Benedito, Luís Fernando Costa Alberto
University of São Paulo, Brazil

B3L-N.3 **A Mixed-Signal Platform Dedicated to Power System Dynamic Computation 1860**
Laurent Fabre, Ira Nagel, Cédric Meinen, Rachid Cherkaoui, Maher Kayal
École Polytechnique Fédérale de Lausanne, Switzerland

B3L-N.4 **Circuit Model of a Phase-Shifting Transformer for Analog Power Flow Emulation 1864**
Juan Jimenez, Chika Nwankpa
Drexel University, United States

B3L-N.5 **High Frequency and Low Power Semi-Synchronous PFM State Machine 1868**
Christian Lindholm
Infineon Technologies Austria AG, Austria

B4P-P: Narrowband Signal Processing Circuits & Systems

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: Louvre
Chair: Alyssa Apsel,

B4P-P.1 **A Fast Lock-in PLL Using a Quadratic V-I Self-Tracking Charge Pump and a Replica-Biased Ring VCO ..... NA**
Yong Chen[2], Pui-In Mak[3], Yumei Zhou[1], Li Zhang[2], He Qian[2], Yan Wang[2], Zhiping Yu[2]
[1]Institute of Microelectronics, Chinese Academy of Sciences, China; [2]Tsinghua University, China; [3]University of Macau, China

B4P-P.2 **-99dBc/Hz@10kHz 1MHz-Step Dual-Loop Integer-N PLL with Anti-Mislocking Frequency Calibration for Global Navigation Satellite System Receiver 1876**
Congyin Shi[1], Chuan Wang[2], Le Ye[1], Huailin Liao[2]
[1]Institute of Microelectronics, Peking University, China; [2]Peking University, China

B4P-P.3 **Third Order Harmonic Cancellation Technique for a Parametric Amplifier 1880**
Hitesh Shrimali, Shouri Chatterjee
Indian Institute of Technology, Delhi, India

B4P-P.4 **A Highly Linear Mixer with Inherent Balun Using a New Technique to Remove Common Mode Currents 1884**
Mahdi Barati, Mohammad Yavari
Amirkabir University of Technology, Iran

B4P-P.5 **Analysis of Transformer-Based Resonator Quality Factor and Bandwidth and the Implications to VCOs 1888**
Amany El-Gouhary, Nathan Neihart
Iowa State University, United States

B4P-Q: Optimization of Communication Systems

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: Louvre
Chair: Wael Badawy, *Intelliview*

B4P-Q.2 **Behavioral Modeling of Direct Sampling Mixer 1892**
Huan Wang[1], Yun Pan[1], Xiaolang Yan[1], Ruohong Huan[2]
[1]Zhejiang University, China; [2]Zhejiang University of Technology, China

B4P-Q.3 **Power Efficiency in Communication Systems from a Circuit Perspective 1896**
Amine Mezghani, Josef A. Nossek
Technische Universität München, Germany

B4P-Q.4 **Adaptive Power Reconfigurability for Decreasing Power Dissipation of Wireless Personal Area Network Receivers 1900**
Alp Oguz[1], Dominique Morche[1], Catherine Dehollain[2]
[1]CEA, LETI, Minatec, France; [2]École Polytechnique Fédérale de Lausanne, Switzerland

B4P-Q.5 **Computationally-Efficient Iterative Decoding for Storage System Design: Min-Sum Refined 1904**
Ben-Yue Chang[2], Milos Ivkovic[1], Lara Dolecek[2]
[1]Cornell University/ LSI Corp, United States; [2]University of California, Los Angeles, United States

B4P-R: Power Converter & Modeling

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Hirotaka Koizumi, *Tokyo University of Science*
Tsorng Juu Liang, *National Cheng Kung University*

B4P-R.1 **Current-Slope-Controlled Adaptive-on-Time DC-DC Converter with Fixed Frequency and Fast Transient Response 1908**
Xiaocheng Jing, Philip K. T. Mok, Ming Chak Lee
Hong Kong University of Science and Technology, Hong Kong

B4P-R.2 **An Energy-Based Heuristic Operator Method for Resonant Power Circuit Estimation Predicting Parameter Sensitivity 1912**
Matthias Radecker[1], Fabio E. Bisogno[3], Lyudmila Zinchenko[2]
[1]Fraunhofer IZM, Germany; [2]Taganrog State University of Radioengineering, Russia; [3]Universidade Federal de Santa Maria, Brazil

B4P-R.3 **Limit Cycle Control of an Industrially Applied Resonant Converter Modelled as a Hybrid System 1916**
Anders Hultgren[2], Jan Melin[3], Per Ranstad[1]
[1]Alstom AB, Sweden; [2]Blekinge Institute of Technology, Sweden; [3]Linneus University, Sweden

B4P-R.4 **An Alternative Strategy for Reducing Mode Transitions in a Four-Switch Buck-Boost Converter 1920**
Martín Federico Ceci, Maria Belen D'Amico
Universidad Nacional del Sur, Argentina

B4P-R.5 **A Step-Up Micro-Power Converter for Solar Energy Harvesting Applications, Using Hill Climbing Maximum Power Point Tracking 1924**
Carlos Carvalho[1], Guilherme Lavareda[3], José Lameiro[2], Nuno Paulino[2]
[1]Instituto Superior de Engenharia de Lisboa, Portugal; [2]UNINOVA/CTS - DEE FCT/UNL, Portugal; [3]Universidade Nova de Lisboa / FCT, Portugal

B4P-S: Digital Circuit Designs II

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Yajun Ha, *National University of Singapore*
Peter Nilsson, *LTH, Lund University*

B4P-S.1 **A Priority Based Output Arbiter for NoC Router 1928**
Cheng-Hao Chan[2], Kun-Lin Tsai[3], Feipei Lai[2], Shun-Hung Tsai[1]
[1]National Taipei University of Technology, Taiwan; [2]National Taiwan University, Taiwan; [3]Tunghai University, Taiwan

B4P-S.2 **A Flexible Hardware Implementation of SHA-1 and SHA-2 Hash Functions 1932**
James Docherty, Albert Koelmans
Newcastle University, United Kingdom

B4P-S.3 **Improved Asynchronous-Logic Dual-Rail Sense Amplifier-Based Pass Transistor Logic with High Speed and Low Power Operation 1936**
Weng Geng Ho, Kwen-Siong Chong, Bah-Hwee Gwee, Joseph Sylvester Chang, Yin Sun, Kok Leong Chang
Nanyang Technological University, Singapore

B4P-S.4 **Reconfigurable Clock Polarity Assignment for Peak Current Reduction of Clock-Gated Circuits 1940**
Jianchao Lu, Baris Taskin
Drexel University, United States

B4P-S.5 **Design Methodology of Multistage Time-Domain Logic Speculation Circuits 1944**
Yinan Sun, Yongpan Liu, Xiaohan Wang, Hongliang Xu, Huazhong Yang
Tsinghua University, China

B4P-S.6 **Implementation of All-Digital Wideband RF Frequency Synthesizers in 65-nm CMOS Technology 1948**
Tapio Rapinoja, Liangge Xu, Kari Stadius, Jussi Ryynänen
Aalto University School of Science and Technology, Finland

B4P-T: Multimedia Systems & Applications

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: Louvre
Chair: Yueh-Min Huang, *National Cheng Kung University*

B4P-T.1 **A Thermal-Aware Task Mapping Flow for Coarse-Grain Dynamic Reconfigurable Processor 1952**
Li Xie, Weifeng He, Naifeng Jing, Zhigang Mao
Shanghai Jiao Tong University, China

B4P-T.2 **Parallel Dynamic Voltage and Frequency Scaling for Stream Decoding Using a Multicore Embedded System 1956**
Ying-Xun Lai[1], Yueh-Min Huang[1], Chin-Feng Lai[2], Ljiljana Trajkovic[3]
[1]National Cheng Kung University, Taiwan; [2]National ILan University, Taiwan; [3]Simon Fraser University, Canada

B4P-T.3 **An Area-Efficient High-Accuracy Prediction-Based CABAC Decoder Architecture for H.264/AVC 1960**
Ming-Yu Kuo, Yao Li, Chen-Yi Lee
National Chiao Tung University, Taiwan

B4P-T.4 **Image Based Approach with K-Mean Clustering for the Compression of Human Motion Sequences 1964**
Boon-Seng Chew, Lap-Pui Chau, Kim-Hui Yap
Nanyang Technological University, Singapore

B4P-U: Nonlinear Signal Processing & Circuits

Time: Tuesday, May 17, 2011, 10:30 - 12:10
Room: Louvre
Chair: Di He, *Shanghai Jiao Tong University*

B4P-U.1 **Robust Synchronization Technique for Chaotic Symbolic Dynamics Modulation 1968**
Georges Kaddoum[3], Ghyslain Gagnon[1], Francois Gagnon[2]
[1]École de technologie supérieure, Canada; [2]Lacime Laboratory, Canada; [3]LACIME Laboratory / École de Technologie Supérieure, Canada

B4P-U.3 **Optimization of Quartic Double-Well Bistable Stochastic Resonance System 1972**
Di He
Shanghai Jiao Tong University, China

B4P-U.4 **A Chaotic Motion Controller for Camera Networks 1976**
Chi-Tsun Cheng, Henry Leung
University of Calgary, Canada

B4P-U.5 **Pseudo-Chaotic Lossy Compression of TRBGs 1980**
Tommaso Addabbo[2], Ada Fort[2], Ljupco Kocarev[1], Santina Rocchi[2], Valerio Vignoli[2]
[1]Academy of Science and Art of Skopje, Macedonia; [2]Università degli Studi di Siena, Italy

B5P-P: Live Demos II

Time: Tuesday, May 17, 2011, 13:40 - 17:20
Room: Louvre
Chair: Tobi Delbruck, *University of Zurich & ETH Zurich*

B5P-P.1 **Distance Sensing for Mini-Robots: RSSI Vs. TDOA.....1984**
Chris Perkins, Lydia Lei, Michael Kuhlman, Tsunghsueh Lee, George Gateau, Sarah Bergbreiter, Pamela Abshire
University of Maryland, United States

B5P-P.2 **Live Demonstration: Packet-Based AER with 3Gevent/s Cumulative Throughput.....1988**
Stefan Schiefer, Stephan Hartmann, Stefan Scholze, Johannes Partzsch, Christian Mayr, Stephan Henker, Rene Schüffny
Technische Universität Dresden, Germany

B5P-P.3 **Live Demonstration: Real-Time Image Processing on ASPA2 Vision System.....1989**
Alexey Lopich, David Barr, Bin Wang, Piotr Dudek
University of Manchester, United Kingdom

B5P-P.4 **Live Demonstration: Material Detection via an Integrated Polarization Imager.....1990**
Timothy York, Rob Perkins, Viktor Gruev
Washington University in St. Louis, United States

B5P-Q: Live Demos I

Time: Tuesday, May 17, 2011, 13:40 - 17:20
Room: Louvre
Chair: Tobi Delbruck, *University of Zurich & ETH Zurich*

B5P-Q.1 **Live Demonstration: Electronic Doubler of Electricity 1991**
Antonio Carlos de Queiroz
Universidade Federal do Rio de Janeiro, Brazil

B5P-Q.2 **Live Demonstration: The Prototype of Real-Time Image Pre-Processing System for Satellites' Remote Sensing 1992**
Tsan-Jieh Chen[2], Chih-Hui Weng[2], Herming Chiueh[2], Chih-Cheng Hsieh[3], Shang-Fu Yeh[3], Wen-Hsu Chang[1], Ying-Zong Juang[1], Hann-Huei Tsai[1], Chin-Fong Chiu[1]
[1]National Applied Research Laboratories, Taiwan; [2]National Chiao Tung University, Taiwan; [3]National Tsing Hua University, Taiwan

B5P-Q.3 **Live Demonstration: a CMOS-Based Lab-on-Chip Array for Combined Magnetic Manipulation and Opto-Chemical Sensing 1997**
Zheng Da Clinton Goh, Pantelis Georgiou, Timothy Constandinou, Themistoklis Prodromakis, Christofer Toumazou
Imperial College London, United Kingdom

B5P-Q.4 **Live Demonstration: MWC for Real-Time Application 2002**
Rolf Hilgendorf, Moshe Mishali, Yonina Eldar, Eli Shoshan, Ina Rivkin
Technion, Israel

C1L-A: Digital to Analog Converters

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: ALHAMBRA I
Chair: Degang Chen, *Iowa State University*

C1L-A.1 **A Novel Temperature and Disturbance Insensitive DAC Calibration Method 2003**
Elbert Bechthum, Georgi Radulov, Arthur van Roermund
Technische Universiteit Eindhoven, Netherlands

C1L-A.2 **An Area-Efficient TFT-LCD Column Driver with DAC Sharing Technique 2007**
Chih-Wen Lu[2], Hung-Cheng Chen[1], Yen-Chung Huang[1]
[1]National Chi Nan University, Taiwan; [2]National Tsing Hua University, Taiwan

C1L-A.3 **A 0.7-V 100-µW Audio Delta-Sigma Modulator with 92-dB DR in 0.13-µm CMOS 2011**
Zhenglin Yang[2], Libin Yao[1], Yong Lian[2]
[1]Kunming Institute of Physics, China; [2]National University of Singapore, Singapore

C1L-A.4 **A Background Calibration for Current-Steering DAC with Current-Splitting Array..... NA**
Long Cheng, Hai-Feng Yang, Fan Ye, Ning Li, Jun Xu, Junyan Ren
Fudan University, China

C1L-A.5 **Timing Error Measurement for Highly Linear Wideband Digital to Analog Converters 2019**
Elbert Bechthum, Yongjian Tang, Hans Hegt, Arthur van Roermund
Technische Universiteit Eindhoven, Netherlands

C1L-B: Interface Circuits

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: ALHAMBRA II
Chair: Mohamad Sawan, *École Polytechnique Montréal*

C1L-B.1 **A Monolithic CMOS MEMS Accelerometer with Chopper Correlated Double Sampling Readout Circuit 2023**
Chun-Kai Wang, Che-Sheng Chen, Kuei-Ann Wen
National Chiao Tung University, Taiwan

C1L-B.2 **High Voltage Protection for USB Transceivers in 45nm CMOS 2027**
Jagdish Chand, Ravi Mehta, Sumantra Seth, Sujoy Chakravarty
Texas Instruments, India, India

C1L-B.3 **The Integrate-and-Fire Sampler: a Special Type of Asynchronous Sigma-Delta Modulator 2031**
Alexander Singh Alvarado, Manu Rastogi, John G. Harris, Jose Principe
University of Florida, United States

C1L-B.4 **A Mostly-Digital Analog Scan-Out Chain for Low Bandwidth Voltage Measurement for Analog IP Test 2035**
Rajath Vasudevamurthy, Pratap Kumar Das, Bharadwaj Amrutur
Indian Institute of Science, India

C1L-B.5 **Bulk-Driven DC Level Shifter 2039**
Yasutaka Haga, Izzet Kale
University of Westminster, United Kingdom

C1L-C: Variability-Aware Modeling & Designs

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: EL PARDO I
Chair(s): Mladen Berekovic, *TU Braunschweig*
Ibrahim N. Hajj, *American University of Beirut*

C1L-C.1 **Leakage Power Analysis Attacks: Effectiveness on DPA Resistant Logic Styles Under Process Variations.....2043**
Milena Djukanovic[3], Luca Giancane[1], Giuseppe Scotti[1], Alessandro Trifiletti[1], Massimo Alioto[2]
[1]Università degli studi di Roma La Sapienza, Italy; [2]Università degli Studi di Siena and Berkeley Wireless Research Center, Italy; [3]University of Montenegro, Montenegro

C1L-C.2 **A Dynamic Calibration Scheme for on-Chip Process and Temperature Variations 2047**
Mina Raymond[1], Maged Ghoneima[2], Yehea Ismail[2]
[1]Nile University, Egypt; [2]Northwestern University / Nile University, United States

C1L-C.3 **Validation of and Delay Variation in Total Ionizing Dose Hardened Standard Cell Libraries 2051**
Lawrence Clark, David Pettit, Keith Holbert, Nathan Hindman
Arizona State University, United States

C1L-C.4 **IDVP (Intra-Die Variation Probe) for System-on-Chip (SoC) Infant Mortality Screen....2055**
Mohd Azman Abdul Latif[1], Dr Noohul Basheer Zain Ali[2], Fawnizu Azmadi Hussin[2]
[1]Intel Corporation, Malaysia; [2]Universiti Teknologi PETRONAS, Malaysia

C1L-C.5 **A Hilbert Curve-Based Delay Fault Characterization Method for FPGAs 2059**
Wenjuan Zhang, Yajun Ha
National University of Singapore, Singapore

C1L-D: Low-Power Circuits I

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: EL PARDO II
Chair(s): Magdy El-Moursy, *Mentor Graphics Corp*
Izzet Kale, *University of Westminster*

C1L-D.1 **A Low-Leakage Parallel CRC Generator for Ultra-Low Power Applications 2063**
Louis Alarcón, Tsung-Te Liu, Jan Rabaey
University of California, Berkeley, United States

C1L-D.2 **Adjacent-State Monitoring Based Fine-Grained Power-Gating Scheme for a Low-Power Asynchronous Pipelined System 2067**
Takao Kawano, Naoya Onizawa, Atsushi Matsumoto, Takahiro Hanyu
Tohoku University, Japan

C1L-D.3 **Ultra-Low Power Current-Based PUF 2071**
Mehrdad Majzoobi[2], Golsa Ghiaasi[2], Farinaz Koushanfar[2], Sani Nassif[1]
[1]IBM Austin Research Laboratory, United States; [2]Rice university, United States

C1L-D.4 **Tapered-VTH CMOS Buffer Design for Improved Energy Efficiency in Deep Nanometer Technology 2075**
Fabio Frustaci[1], Pasquale Corsonello[1], Massimo Alioto[2]
[1]Portale Università della Calabria, Italy; [2]Università degli Studi di Siena and Berkeley Wireless Research Center, Italy

C1L-D.5 **A Novel Back-Biasing Low-Leakage Technique for FinFET Forced Stacks 2079**
Davide Baccarin[3], David Esseni[2], Massimo Alioto[1]
[1]Università degli Studi di Siena and Berkeley Wireless Research Center, Italy; [2]Università degli studi di Udine, Italy; [3]University of Udine, Italy

C1L-E: Biometrics, Biomedical Signal Processing & Bioimaging Technology

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: ORIENTE
Chair(s): Wael Badawy, *Intelliview*
Wai-Chi Fang, *National Chiao Tung University*

C1L-E.1 **Low Power InfomaxICA with Compensation Strategy for Binaural Hearing-Aid 2083**
Fan-Chiang Yi[3], Ching-Wen Huang[1], Tai-Shih Chi[2], Shyh-Jye Jou[2]
[1]Institution of Communication Engineering, Taiwan; [2]National Chiao Tung University, Taiwan; [3]National Tsing Hua University, Taiwan

C1L-E.2 **Integrated Transceivers for UWB Breast Cancer Imaging: Architecture and Circuit Constraints 2087**
Matteo Bassi, Andrea Bevilacqua, Andrea Gerosa, Andrea Neviani
Università degli Studi di Padova, Italy

C1L-E.3 **Improved Ultrasound Digital Beamforming Using Single-Bit Sigma-Delta Modulators with Band-Pass Decimation Filters 2091**
Gunes Damla Altinok, Mohammed Al-Janabi, Izzet Kale
University of Westminster, United Kingdom

C1L-E.4 **Compressive Sampling of EMG Bio-Signals 2095**
Aabeeya Salman, Emily Allstot, Andrew Chen, Anna Dixon, Daibashish Gangopadhyay, David Allstot
University of Washington, United States

C1L-E.5 **Effects of Quantization on Neural Spike Sorting 2099**
Sarah Gibson, Victoria Wang, Dejan Markovic
University of California, Los Angeles, United States

C1L-F: Recent Advances in Complex Networks & Multi-Agent Systems

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: IMPERIAL I
Chair(s): Xiang Li, *Fudan University*
Jinhu Lu, *Chinese Academy of Sciences*

C1L-F.1 **Modelling, Analysis and Control of Multi-Agent Systems: a Brief Overview 2103**
Jinhu Lü[1], Guanrong Chen[2], Xinghuo Yu[3]
[1]Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China; [2]City University of Hong Kong, China; [3]RMIT University, Australia

C1L-F.2 **Study of near Consensus Complex Social Networks Using Eigen Theory 2107**
Wing-Kuen Ling[3], Paul Stewart[3], Kok-Lay Teo[1], Chi-Kong Tse[2]
[1]Curtin University of Technology, Australia; [2]Hong Kong Polytechnic University, China; [3]University of Lincoln, United Kingdom

C1L-F.3 **Can Stubbornness or Gullibility Lead to Faster Consensus? a Study of Various Strategies for Reaching Consensus in a Model of the Naming Game 2111**
Chai Wah Wu
IBM T. J. Watson Research Center, United States

C1L-F.4 **A Gravity-Based A/R Model of Swarming a Multi-Agent Network with Density Information.....2115**
Wenqiang Tian, Xiang Li
Fudan University, China

C1L-F.5 **Multi-Granularity Dynamic Analysis of Complex Software Networks.....2119**
Bing Li[2], Weifeng Pan[2], Jinhu Lü[1]
[1]Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China; [2]Wuhan University, China

C1L-G: Compressed Sensing & Nonlinear Signal Processing

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: ALVORADA I
Chair(s): Oscar C. Au, *Hong Kong University of Science & Technology*
Wei Xing Zheng, *University of Western Sydney*

C1L-G.1 **Signal Recovery Method for Compressive Sensing Using Relaxation and Second-Order Cone Programming 2125**
Flávio Teixeira, Stuart Bergen, Andreas Antoniou
University of Victoria, Canada

C1L-G.2 **Analog-to-Information Conversion of Sparse and Non-White Signals: Statistical Design of Sensing Waveforms 2129**
Mauro Mangia[2], Riccardo Rovatti[2], Gianluca Setti[1]
[1]Università degli Studi di Catania, Italy; [2]Università di Bologna, Italy

C1L-G.3 **Impulsive Noise Estimation and Cancellation in DSL Using Compressive Sampling 2133**
Tareq Al-Naffouri[1], Ahmed Abdul Quadeer[1], F. Al-Shaalan[2], Hedi Hmida[2]
[1]King Fahd University of Petroleum & Minerals, Saudi Arabia; [2]Saudi Telecom Company, Saudi Arabia

C1L-G.4 **On Design of Reduced-Order H2 Filters for Discrete Repetitive Processes 2137**
Ligang Wu[1], Wei Xing Zheng[2]
[1]Harbin Institute of Technology, China; [2]University of Western Sydney, Australia

C1L-G.5 **A Very Efficient Single-Iteration Oldest-Out Data Sorter 2141**
Volnei Pedroni, Ricardo Jasinski, Ricardo Pedroni
Universidade Tecnológica Federal do Paraná, Brazil

C1L-H: Image & Video Compression

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: ALVORADA II
Chair(s): Moncef Gabbouj, *Tampere University of Technology*
Tokunbo Ogunfunmi, *Santa Clara University California*

C1L-H.1 **A Low-Complexity Parametric Transform for Image Compression 2145**
Saad Bouguezel, M. Omair Ahmad, M.N.S. Swamy
Concordia University, Canada

C1L-H.2 **Frame-Level Dependent Bit Allocation via Geometric Programming 2149**
Chao Pang, Oscar Au, Jingjing Dai, Feng Zou
Hong Kong University of Science and Technology, Hong Kong

C1L-H.3 **Perceptual Multiview Video Coding Using Synthesized Just Noticeable Distortion Maps 2153**
Yu Gao[2], Xiaoyu Xiu[2], Jie Liang[2], Weisi Lin[1]
[1]Nanyang Technological University, Singapore; [2]Simon Fraser University, Canada

C1L-H.4 **Lossless Implementation of Daubechies 8-Tap Wavelet Transform 2157**
Khan A. Wahid, Md. Ashraf Islam, Seokbum Ko
University of Saskatchewan, Canada

C1L-J: Cellular Neural/Nanoscale Networks & Systems

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: ITAMARATY I
Chair(s): Chai Wah Wu, *IBM T. J. Watson Research Center*
Akos Zarandy, *Hungarian Academy of Sciences*

C1L-J.1 **Further Results on Convergence of Cooperative Standard Cellular Neural Networks 2161**
Mauro Di Marco, Mauro Forti, Massimo Grazzini, Luca Pancioni
Università degli Studi di Siena, Italy

C1L-J.2 **An Active Wave Computing Based Path Finding Approach for 3-D Environment..... 2165**
Volkan Kilic, Mustak Erhan Yalcin
istanbul technical university, Turkey

C1L-J.3 **Locally Connected Processor Arrays for Matrix Multiplication and Linear Transforms..... 2169**
Chai Wah Wu
IBM T. J. Watson Research Center, United States

C1L-J.4 **Collision Avoidance for UAV Using Visual Detection..... 2173**
Tamás Zsedrovits[2], Akos Zarándy[1], Bálint Vanek[1], Tamás Péni[1], József Bokor[1], Tamás Roska[1]
[1]MTA-SZTAKI & Pázmány Péter Catholic University, Hungary; [2]Pázmány Péter Catholic University, Hungary

C1L-J.5 **Influence of External Input on Oscillatory Cellular Nonlinear Networks Dynamics 2177**
Linda Ponta, Valentina Lanza, Michele Bonnin, Fernando Corinto
Politecnico di Torino, Italy

C1L-K: Cognitive Radio & SDR I

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: SEGOVIA I
Chair: Lan-Da Van, *National Chiao Tung University*

C1L-K.1 **A 0.7 - 2.6 GHz High-Linearity RF Front-End for Cognitive Radio Spectrum Sensing 2181**
Kari Stadius, Mikko Kaltiokallio, Jussi Ollikainen, Tuomas Pärnänen, Ville Saari, Jussi Ryynänen
Aalto University School of Science and Technology, Finland

C1L-K.2 **Towards Suppression of All Harmonics in a Polyphase Multipath Transmitter 2185**
Saqib Subhan, Eric Klumperink, Bram Nauta
University of Twente, Netherlands

C1L-K.3 **Advanced Filter Bank Based Approach for Blocker Detection in LTE Systems 2189**
Thomas Schlechter, Mario Huemer
Klagenfurt University, Austria

C1L-K.4 **Architecture and Implementation of a Software-Defined Radio Baseband Processor 2193**
Ulrich Ramacher[2], Wolfgang Raab[2], Ulrich Hachmann[2], Dominik Langen[2], Jörg Berthold[2], Ronalf Kramer[2], Alexander Schackow[2], Cyprian Grassmann[2], Mirko Sauermann[2], Piotr Szreder[2], Fatih Capar[2], Goran Obradovic[2], Wen Xu[2], Nikolaus Brüls[2], Kang Lee[3], Eugene Weber[3], Ray Kuhn[1], John Harrington[3]
[1]Infineon Technologies, United States; [2]Infineon Technologies AG, Germany; [3]Infineon Technologies North America, United States

C1L-K.5 **A Cross-Correlation Based Signal Detector with Two-Step Down-Converter Robust to Finite Image Rejection 2197**
Wei-Gi Ho, Ranjit Gharpurey
University of Texas at Austin, United States

C1L-L: Circuit Techniques for Sensors

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: SEGOVIA II
Chair(s): Tobi Delbruck, *University of Zurich & ETH Zurich*
Teresa Serrano-Gotarredona, *IMSE-CNM-CSIC*

C1L-L.1 **A Circuit That Creates a Logarithmic Response from an Integrating CMOS Pixel.....2201**
Dipayan Das, Stephen Collins
University of Oxford, United Kingdom

C1L-L.2 **Boosted Readout for CMOS APS Pixels 2205**
Suat Ay
University of Idaho, United States

C1L-L.3 **A Very High Dynamic Range Interface Circuit for Resistive Gas Sensor Matrix Read-Out 2209**
Fabrizio Conso[2], Marco Grassi[2], Piero Malcovati[2], Andrea Baschirotto[1]
[1]Università degli Studi di Milano-Bicocca, Italy; [2]Università degli studi di Pavia, Italy

C1L-L.4 **125ppm Resolution and 120dB Dynamic Range Nanoparticle Chemiresistor Array Readout Circuit.....2213**
Xiaoyi Mu, Daniel Rairigh, Andrew Mason
Michigan State University, United States

C1L-L.5 **Self-Quenching, Forward-Bias-Reset for Single Photon Avalanche Detectors in 1.8V, 0.18µm Process.....2217**
Changhyuk Lee, Alyosha Molnar
Cornell University, United States

C1L-M: 3-D Integrated Systems: Design Methodologies, Architectures, and Manufacturing

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: SEGOVIA III
Chair(s): Eby Friedman, *University of Rochester*
Pavlidis Vasileios, *Swiss École Polytechnique Federal de Lausanne*

C1L-M.1 **Skew Variability in 3-D ICs with Multiple Clock Domains 2221**
Hu Xu, Vasilis Pavlidis, Giovanni De Micheli
École Polytechnique Fédérale de Lausanne, Switzerland

C1L-M.2 **Clock Distribution Models of 3-D Integrated Systems 2225**
Ioannis Savidis[2], Vasilis Pavlidis[1], Eby Friedman[2]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]University of Rochester, United States

C1L-M.3 **CAD Tools for Designing 3D Integrated Systems 2229**
Kostas Siozios, Antonis Papanikolaou, Dimitrios Soudris
National Technical University of Athens, Greece

C1L-M.4 **3D Monolithic Integration 2233**
Perrine Batude, Maud Vinet, Arnaud Pouydebasque, Cyrille Leroyer, Bernard Previtali, Claude Tabone, Jean-Michel Hartmann, Loic Sanchez, Laurence Baud, Veronique Carron, Alain Toffoli, Fabienne Allain, Vincent Mazzocchi, Dominique Lafond, Simon Deleonibus, Olivier Faynot
CEA, LETI, Minatec, France

C1L-M.5 **Thermal Analysis and Active Cooling Management for 3D MPSoCs 2237**
Mohamed Sabry, David Atienza, Kivilcim Coskun
École Polytechnique Fédérale de Lausanne, Switzerland

C1L-N: Emerging Nanoelectronic Devices

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: SEGOVIA IV
Chair: Garrett Rose, *New York University*

C1L-N.1 **Parallel Memristors: Improving Variation Tolerance in Memristive Digital Circuits 2241**
Jeyavijayan Rajendran, Ramesh Karri, Garrett S. Rose
Polytechnic Institute of New York University, United States

C1L-N.2 **Time-Dependency of the Threshold Voltage in Memristive Devices 2245**
Eero Lehtonen[2], Jussi Poikonen[2], Mika Laiho[2], Wei Lu[1]
[1]University of Michigan, United States; [2]University of Turku, Finland

C1L-N.3 **Experimental Analysis of Buried SiGe pMOSFETs from the Perspective of Aggressive Voltage Scaling 2249**
Felice Crupi[2], Massimo Alioto[3], Jacopo Franco[1], Paolo Magnone[4], Ben Kaczer[1], Guido Groeseneken[1], Jerome Mitard[1], Liesbeth Witters[1], Thomas Y. Hoffmann[1]
[1]IMEC, Belgium; [2]Portale Università della Calabria, Italy; [3]Università degli Studi di Siena and Berkeley Wireless Research Center, Italy; [4]Università di Bologna, Italy

C1L-N.4 **Silicon-on-Insulator (SOI) Integration for Organic Field Effect Transistor (OFET) Based Circuits 2253**
Recep Özgün, Byung Jung, Bal Dhar, Howard Katz, Andreas Andreou
Johns Hopkins University, United States

C1L-N.5 **An Analytical Mismatch Model of Nano-CMOS Device Under Impact of Intrinsic Device Variability 2257**
Feng Hong, Binjie Cheng, Scott Roy, David Cumming
University of Glasgow, United Kingdom

C2L-A: Analog Circuit Modelling and Optimization Techniques

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: ALHAMBRA I
Chair: Igor Filanovsky, *University of Alberta*

C2L-A.1 **Analysis and Optimization of Distributed Delay Circuits ..... NA**
Amin Jahanian, Payam Heydari
University of California, Irvine, United States

C2L-A.2 **An Optimum Linear Phase Approximation with Small Delay Obtained by the Manipulation of All-Pass Padé Approximants 2265**
Douglas de Souza, Sidnei Noceti Filho
Universidade Federal de Santa Catarina, Brazil

C2L-A.3 **Effective Modeling of CT Functions for Fast Simulations Using MATLAB-Simulink and VHDLAMS Applied to Sigma-Delta Architectures 2269**
Philippe Benabes, Catalin-Adrian Tugui
Supélec, France

C2L-A.4 **Analog Circuit Optimization via a Modified Imperialist Competitive Algorithm 2273**
Milad Razzaghpour, Ana Rusu
Royal Institute of Technology, Sweden

C2L-A.5 **A Comprehensive Tapered Buffer Optimization Algorithm for Unified Design Metrics 2277**
Song Liu, Seda Ogrenci Memik, Yehea Ismail
Northwestern University, United States

C2L-B: Bandgap Circuits

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: ALHAMBRA II
Chair: Vadim Ivanov, *Texas Instruments*

C2L-B.1 **A Novel Low Voltage Subtracting Bandgap Reference with Temperature Coefficient of 2.2 PPM/ºC 2281**
Wenrui Zhu[2], Haigang Yang[1], Tongqiang Gao[1]
[1]Institute of Electronics / Chinese Academy of Science, China; [2]Institute of Electronics / Chinese Academy of Science & Graduate University of CAS, China

C2L-B.2 **A Nanopower CMOS Bandgap Reference with 30ppm/Degree C from -30 Degree C to 150 Degree C 2285**
Pengpeng Yuan, Zhihua Wang, Dongmei Li, Xin Wang, Liyuan Liu
Tsinghua University, China

C2L-B.3 **A Simple CMOS Bandgap Reference Circuit with Sub-1-V Operation 2289**
João Navarro, Eder Ishibe
University of São Paulo, Brazil

C2L-B.4 **Low-Dropout Regulators: Hybrid-Cascode Compensation to Improve Stability in Nano-Scale CMOS Technologies 2293**
Hamed Aminzadeh[1], Wouter Serdijn[2]
[1]Delft University of Technology, Netherlands; [2]Technische Universiteit Delft, Netherlands

C2L-B.5 **Adjustable Input Self-Strobed Delay Line ADC Intended to Implantable Devices 2297**
Robert Chebli, Mohamad Sawan
École Polytechnique de Montréal, Canada

C2L-C: DSP Circuit Designs

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: EL PARDO I
Chair(s): Oscar Gustafsson, *Linkoping University*
Lars Wanhammar, *Linkoping University*

C2L-C.1 **Hardware-Efficient Parallel FIR Digital Filter Structures for Symmetric Convolutions 2301**
Yu-Chi Tsao, Ken Choi
Illinois Institute of Technology, United States

C2L-C.2 **Fault Tolerant Computing for Stream DSP Applications Using GALS Multi-Core Processors 2305**
Zhiyi Yu, Zewen Shi, Xiaoyang Zeng
Fudan University, China

C2L-C.3 **StreamPoP: Stream Programming Oriented Power-Efficient Audio DSP 2309**
Ji Kong, Peilin Liu, Zhenqi Wei, Kun Yang, Ying Ye, Rendong Ying
Shanghai Jiao Tong University, China

C2L-C.4 **Multi-Objective Optimization of Minority-3 Functions for Ultra-Low Voltage Supplies 2313**
Hans Kristian Otnes Berge, Snorre Aunet
University of Oslo, Norway

C2L-C.5 **Energy Efficient Pseudo-Cache Architecture Through Fine-Grained Reconfigurability 2317**
Gabriel L. Nazar, Luigi Carro
Universidade Federal do Rio Grande do Sul, Brazil

C2L-D: Circuit Testing & Modeling

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: EL PARDO II
Chair(s): Magdy El-Moursy, *Mentor Graphics Corp*
Bah-Hwee Gwee, *Nanyang Technological University*

C2L-D.1 **Compact Lumped Element Model for Tsv in 3D-Ics 2321**
Khaled Salah[2], Alaa El Rouby[2], Hani Ragai[1], Karim Amin[3], Yehea Ismail[3]
[1]Ain Shams University, Egypt; [2]Mentor Graphics, Egypt; [3]Nile University, Egypt

C2L-D.2 **The Arbiter-PUF with High Uniqueness Utilizing Novel Arbiter Circuit with Delay-Time Measurement 2325**
Kota Fruhashi, Mitsuru Shiozaki, Akitaka Fukushima, Takahiko Murayama, Takeshi Fujino
Ritsumeikan University, Japan

C2L-D.3 **Evaluation of a Distributed Fault Handler Method for MPSoC 2329**
Nicolas Hébert[2], Gabriel Marchesan Almeida[1], Pascal Benoit[1], Gilles Sassatelli[1], Lionel Torres[1]
[1]Laboratory of Informatics, Robotics and Microelectronics of Montpellier, LIRMM, France; [2]STMicroelectronics/LIRMM, France

C2L-D.4 **A Hybrid Watermarking Scheme for Sequential Functions 2333**
Aijiao Cui[1], Chip Hong Chang[2], Li Zhang[2]
[1]Harbin Institute of Technology, China; [2]Nanyang Technological University, Singapore

C2L-D.5 **Efficient Inductance Calculation for Long and Medium Length Rectangular Interconnects in VLSI Circuits 2337**
Yiorgos Bontzios[2], Michael Dimopoulos[1], Alkis Hatzopoulos[2]
[1]Alexander Technological Educational Institute of Thessaloniki, Greece; [2]Aristotle University of Thessaloniki, Greece

C2L-E: Integrated Biomedical Systems, BioMEMS, Bio-Sensors/Actuators & Lab-On-Chip

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: ORIENTE
Chair: Mohamad Sawan, *École Polytechnique Montréal*

C2L-E.1 **Contactless Fluorescence Imaging with a CMOS Image Sensor 2341**
Andreas Andreou[2], Zhaonian Zhang[2], Recep Ozgun[2], Edward Choi[2], Zaven Kalayjian[2], Miriam Marwick[2], Jennifer Blain Christen[1], Leslie Tung[2]
[1]Arizona State University, United States; [2]Johns Hopkins University, United States

C2L-E.2 **Planar Microcoils Array Applied to Magnetic Beads Based Lab-on-Chip for High Throughput Applications 2345**
Yushan Zheng, Sara Bekhiche, Mohamad Sawan
École Polytechnique de Montréal, Canada

C2L-E.3 **A New Fully Integrated CMOS Interface for a Dielectrophoretic Lab-on-a-Chip Device 2349**
Mohamed Amine Miled, Mohamad Sawan
École Polytechnique de Montréal, Canada

C2L-E.4 **Extending the Dynamic Range of Implantable Real-Time Neurochemical Monitoring Systems 2353**
Carlos I. Dorta-Quiñones, Rajeev Dokania, Alyssa Apsel
Cornell University, United States

C2L-E.5 **Attitude Sensing System Design for Wireless Micro-Ball Endoscopy 2357**
Jun Hu, Xiang Xie, Guolin Li, Yingke Gu, Yemao Zeng, Zhihua Wang
Tsinghua University, China

C2L-F: Quantum-Dot Cellular Automata (QCA) Circuit Design

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: IMPERIAL I
Chair: Maire O'Neill, *Queen's University, Belfast*

C2L-F.1 **Design Rules for Quantum-Dot Cellular Automata 2361**
Weiqiang Liu[1], Liang Lu[1], Maire O'Neill[1], Earl Swartzlander Jr[2]
[1]Queen's University Belfast, United Kingdom; [2]University of Texas at Austin, United States

C2L-F.2 **Ground-State Simulation Tool for Field-Clocked Three-State Molecular Quantum-Dot Cellular Automata (QCA) ..... NA**
Faizal Karim, Konrad Walus
University of British Columbia, Canada

C2L-F.3 **Irreversible Bit Erasures in Binary Multipliers 2369**
Ismo Hänninen[1], Jarmo Takala[1], Craig Lent[2]
[1]Tampere University of Technology, Finland; [2]University of Notre Dame, United States

C2L-F.4 **A Review of Magnetic Cellular Automata Systems 2373**
Sanjukta Bhanja, Javier Pulecio
University of South Florida, United States

C2L-F.5 **QCAPro - an Error-Power Estimation Tool for QCA Circuit Design 2377**
Saket Srivastava[1], Arjun Asthana[1], Sanjukta Bhanja[2], Sudeep Sarkar[2]
[1]Indraprastha Institute of Information Technology, Delhi, India; [2]University of South Florida, United States

C2L-G: Signal Processing in Orthogonal Frequency Division Multiplexing (OFDM)

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: ALVORADA I
Chair(s): Yoshikazu Miyanaga, *Hokkaido University*
Wei-Ping Zhu, *Concordia University*

C2L-G.1 **Reduced-Complexity Interpolation-Based QR Decomposition Using Partial Layer Mapping.....2381**
Li-Wei Chai[2], Po-Lin Chiu[1], Yuan-Hao Huang[2]
[1]Industrial Technology Research Institute, Taiwan; [2]National Tsing Hua University, Taiwan

C2L-G.2 **A Reconfigurable Baseband Processor for Wireless OFDM Synchronization Sub-System.....2385**
Mahmoud Abdelall, Ahmed F. Shalash, Hossam A. H. Fahmy
Cairo University, Egypt

C2L-G.3 **DCD-Based Simplified Matrix Inversion for MIMO-OFDM 2389**
Zhi Quan[2], Yuriy Zakharov[3], Jie Liu[1]
[1]RF Engines Ltd, United Kingdom; [2]Universidade Federal de Juiz de Fora, Brazil; [3]University of York, United Kingdom

C2L-G.4 **Compensation of IQ Imbalance and Transmitter Nonlinearities in Broadband MIMO-OFDM.....2393**
Fernando Gregorio[2], Juan Edmundo Cousseau[2], Stefan Werner[1], Taneli Riihonen[1], Risto Wichman[1]
[1]Aalto University School of Science and Technology, Finland; [2]Universidad Nacional del Sur, Argentina

C2L-G.5 **An Uncoded BER Comparison Between DFE-SCCP and OFDM Using a Convex Analysis Framework 2397**
Amanda de Paula, Cristiano Panazio
Universidade de São Paulo / Escola Politécnica, Brazil

C2L-H: Speech Processing

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: ALVORADA II
Chair(s): Håkan Johansson, *Linköping University*
Raija Else Tuulikki Lehto, *Tampere University of Technology*

C2L-H.1 **Sparse Kernel Cepstral Coefficients (SKCC): Inner-Product Based Features for Noise-Robust Speech Recognition 2401**
Amin Fazel, Shantanu Chakrabartty
Michigan State University, United States

C2L-H.2 **Pitch-Synchronous Time Alignment of Speech Signals for Prosody Transplantation 2405**
Vagner Latsch, Sergio Netto
Universidade Federal do Rio de Janeiro, Brazil

C2L-H.3 **Adaptive Thresholding Approach for Robust Voiced/Unvoiced Classification 2409**
Md. Khademul Islam Molla[2], Keikichi Hirose[2], Sujan Kumar Roy[1], Shamim Ahmad[1]
[1]University of Rajshahi, Bangladesh; [2]University of Tokyo, Japan

C2L-H.4 **Weighted Noise Subtraction and Adaptive Soft-Thresholding Approach to Speech Enhancement 2413**
Somlal Das[1], Md. Ekramul Hamid[1], Keikichi Hirose[2], Md. Khademul Islam Molla[2]
[1]University of Rajshahi, Bangladesh; [2]University of Tokyo, Japan

C2L-H.5 **Dominant Harmonic Modification with Data Adaptive Filter Based Algorithm for Robust Pitch Estimation 2417**
Sujan Kumar Roy[2], Md. Kamrul Hasan[1], Keikichi Hirose[3], Md. Khademul Islam Molla[3]
[1]Bangladesh University of Engineering and Technology, Bangladesh; [2]University of Rajshahi, Bangladesh; [3]University of Tokyo, Japan

C2L-J: Neuromorphic Systems

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: ITAMARATY I
Chair(s): Ralph Etienne-Cummings, *Johns Hopkins University*
John Harris, *University of Florida, Gainesville*

C2L-J.1 **Integrate and Fire Circuit as an ADC Replacement 2421**
Manu Rastogi, Alexander Singh Alvarado, John G. Harris, Jose Príncipe
University of Florida, United States

C2L-J.2 **Motion Image Sensor with on-Chip Adaptation and Programmable Filtering..... 2425**
Peng Xu, Pamela Abshire, Sean Humbert
University of Maryland, United States

C2L-J.3 **Online Correction of Orientation Estimates Using Spatial Memory in a Neuromorphic Head Direction System..... 2429**
Tarek Massoud, Timothy Horiuchi
University of Maryland, United States

C2L-J.4 **Voltage Mode Driver for Low Power Transmission of High Speed Serial AER Links ..2433**
Carlos Zamarreño-Ramos[1], Teresa Serrano-Gotarredona[1], Bernabe Linares-Barranco[1], Raghavendra Kulkarni[2], José Silva-Martinez[3]
[1]IMSE-CNM, CSIC and Universidad de Sevilla, Spain; [2]Texas A&M University, United States; [3]Texas A&M University, College Station, United States

C2L-J.5 **Evaluating on-Chip Interconnects for Low Operating Frequency Silicon Neuron Arrays 2437**
Andrew Cassidy[1], Thomas Murray[1], Andreas Andreou[1], Julius Georgiou[2]
[1]Johns Hopkins University, United States; [2]University of Cyprus, Cyprus

C2L-K: Cognitive Radio & SDR II

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: SEGOVIA I
Chair: Tokunbo Ogunfunmi, *Santa Clara University California*

C2L-K.1 **Analog Chirp Fourier Transform for High-Resolution Real-Time Wideband RF Spectrum Analysis 2441**
Daibashish Gangopadhyay, Andrew Chen, David Allstot
University of Washington, United States

C2L-K.2 **Reducing Spurious PLL Tones in Spectrum Sensing Architectures 2445**
Shang-Kee Ting, Ali H. Sayed
University of California, Los Angeles, United States

C2L-K.3 **Low-Power FFT Design for NC-OFDM in Cognitive Radio Systems 2449**
In-Gul Jang[1], Zhe-Yan Piao[1], Ze-Hua Dong[1], Jin-Gyun Chung[1], Kang-Yoon Lee[2]
[1]Chonbuk National University, Korea, South; [2]Konkuk University, Korea, South

C2L-K.4 **A 0.13µm CMOS 1.5-to-2.15GHz Low Power Transmitter Front-End for SDR Applications 2453**
Zhigang Sun, Baoyong Chi, Chun Zhang, Zhihua Wang
Tsinghua University, China

C2L-K.5 **Reconfigurable Filter Implementation of a Matched-Filter Based Spectrum Sensor for Cognitive Radio Systems 2457**
Amir Hossein Gholamipour[2], Ali Gorcin[3], Hasari Celebi[1], Behcet Ugur Toreyin[1], Mazen A. R. Saghir[1], Fadi Kurdahi[2], Ahmed Eltawil[2]
[1]Texas A&M University at Qatar, Qatar; [2]University of California, Irvine, United States; [3]University of South Florida, United States

C2L-L: Audio Sensors and Energy Harvesting

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: SEGOVIA II
Chair(s): Amine Bermak, *Hong Kong University of Science & Technology*
Ralph Etienne-Cummings, *Johns Hopkins University*

C2L-L.1 **Estimating the Location of a Sound Source with a Spike-Timing Localization Algorithm 2461**
Holger Finger[1], Shih-Chii Liu[2]
[1]University of Osnabrueck, Germany; [2]University of Zurich/ETH Zurich, Switzerland

C2L-L.2 **Design of a Spike Event Coded RGT Microphone for Neuromorphic Auditory Systems..... 2465**
Thomas Koickal[1], Rhonira Latif[1], Luiz Gouveia[1], Enrico Mastropaolo[1], Shiwei Wang[1], Alister Hamilton[1], Rebecca Cheung[1], Michael Newton[2], Leslie Smith[2]
[1]University of Edinburgh, United Kingdom; [2]University of Stirling, United Kingdom

C2L-L.3 **Design of Analog Audio Classifiers with AdaBoost-Based Feature Selection 2469**
Leung Kin Chiu, Brian Gestner, David Anderson
Georgia Institute of Technology, United States

C2L-L.4 **A Hybrid Energy Scavenging Sensor for Long-Term Mechanical Strain Monitoring ... 2473**
Chenling Huang, Shantanu Chakrabartty
Michigan State University, United States

C2L-L.5 **RF Energy Harvester Design with Autonomously Adaptive Impedance Matching Network Based on Auxiliary Charge-Pump Rectifier 2477**
Ping Zhao, Manfred Glesner
Technischen Universität Darmstadt, Germany

C2L-M: From System to Transistors: Electronic Design Automation of Contemporary VLSI Design

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: SEGOVIA III
Chair(s): Frank Liu, *Austin Research Lab, IBM*
Ricardo Reis, *Federal University of Rio Grande do Sul, Brazil*

C2L-M.1 **Thermal-Aware System-Level Modeling and Management for Multi-Processor Systems-on-Chip 2481**
Francesco Zanini[1], David Atienza[1], Luca Benini[2], Giovanni De Micheli[1]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]Università di Bologna, Italy

C2L-M.2 **Design Automation of Transistor Networks, a New Challenge 2485**
Ricardo Reis
Universidade Federal do Rio Grande do Sul, Brazil

C2L-M.3 **Hybrid Heterogeneous Energy Supply Networks 2489**
Farinaz Koushanfar, Azalia Mirhoseini
Rice University, United States

C2L-M.4 **Pure Nodal Analysis for Efficient on-Chip Interconnect Model Order Reduction 2493**
Frank Liu[1], Peter Feldmann[2]
[1]IBM Austin Research Laboratory, United States; [2]IBM T.J. Watson Research Center, United States

C2L-N: Nanorobotics & Nano-Giga Circuits

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: SEGOVIA IV
Chair: Chua-Chin Wang, *National Sun Yat-Sen University*

C2L-N.1 **Stateful Logic Pipeline Architecture 2497**
Kyosun Kim[2], Sangho Shin[1], Sung-Mo Kang[1]
[1]University of California, Merced, United States; [2]University of Incheon, Korea, South

C2L-N.2 **Towards a Legged Chip 2501**
Timir Datta[1], Pamela Abshire[1], Andy Turner[2]
[1]University of Maryland, United States; [2]Virginia Polytechnic Institute and State University, United States

C2L-N.3 **Combining SDM-Based Circuit Switching with Packet Switching in a NoC for Real-Time Applications 2505**
Angelo Kuti Lusala, Jean-Didier Legat
Université catholique de Louvain, Belgium

C2L-N.4 **Electrostatic Actuation and Control of Micro Robots Using a Post-Processed High-Voltage SOI CMOS Chip 2509**
Mustafa Emre Karagozler, Anil Thaker, Seth Copen Goldstein, David Ricketts
Carnegie Mellon University, United States

C2L-N.5 **Leakage Current and Bottom Gate Voltage Considerations in Developing Maximum Performance 16nm N-Channel Carbon Nanotube Transistors 2513**
Yanan Sun, Volkan Kursun
Hong Kong University of Science and Technology, China

C3L-A: Mixed Signal Circuits & Testing

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: ALHAMBRA I
Chair: Degang Chen, *Iowa State University*

C3L-A.1 **Improved Dynamic Range, Digitally-Controlled Linear-in-dB CMOS Variable Gain Amplifier 2517**
Sandhya Purighalla, Brent Maundy
University of Calgary, Canada

C3L-A.2 **OBT Implementation on Gm-C Filters Without Self-Tuning Capability 2521**
Pablo Petrashin[1], Carlos Dualibe[2]
[1]Universidad Catolica de Cordoba, Argentina; [2]Université de Mons, Belgium

C3L-A.3 **An Ultra Low-Power Low-Voltage Programmable Temperature Detection Circuit 2525**
Alfredo Olmos[1], Stefano Pietri[1], Ricardo Coimbra[1], Murilo Franco Neto[2], Jefferson Soldera[3]
[1]Freescale Semiconductor, Brazil; [2]Information Technology Center Renato Archer-CTI, Brazil; [3]Laboratório de Sistemas Integráveis Tecnológico, Brazil

C3L-A.4 **An Equivalent-Time and Clocked Approach for Continuous-Time Quantization 2529**
Takahiro Yamaguchi[1], Mohamed Abbas[3], Mani Soma[4], Takafumi Aoki[2], Yasuo Furukawa[1], Katsuhiko Degawa[1], Satoshi Komatsu[3], Kunihiro Asada[3]
[1]Advantest Laboratories, Japan; [2]Tohoku University, Japan; [3]University of Tokyo, Japan; [4]University of Wachington, United States

C3L-A.5 **A Hybrid Phase-Locked Loop for CDR Applications 2533**
Mohammad Jalali, Alireza Sharif Bakhtiar, Shahriar Mirabbasi
University of British Columbia, Canada

C3L-B: Voltage Regulators & References

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: ALHAMBRA II
Chair: Gaetano Palumbo, *Università di Catania*

C3L-B.1 **An Accurate Sense-FET Current Limiter with Embedded Soft-Start for Linear DC/DC Converters 2537**
Jader A. De Lima[1], Wallace Pimenta[2]
[1]Center of Technology for Information, Brazil; [2]PST Electronics, Brazil

C3L-B.2 **Supercapacitor-Based Reconfigurable Energy Management Unit for Autonomous Wireless Sensor Nodes 2541**
Joseph Sankman, Hai Chen, Dongsheng Ma
University of Texas at Dallas, United States

C3L-B.3 **Power Management Controller for Automotive MCU Applications in 90nm CMOS Technology 2545**
Andre Luis Mansano[1], Andre Luis Vilas Boas[1], Alfredo Olmos[1], Stefano Pietri[1], Jefferson Soldera[2]
[1]Freescale Semiconductor, United States; [2]Laboratório de Sistemas Integráveis Tecnológico, Brazil

C3L-B.4 **Temperature and Hump Effect Impact on Output Voltage Spread of Low Power Bandgap Designed in the Sub-Threshold Area 2549**
Yohan Joly[3], Laurent Truphemus[2], Laurent Lopez[2], Jean-Michel Portal[1], Hassen Aziza[1], Franck Julien[2], Pascal Fornara[2]
[1]IM2NP Laboratory, France; [2]STMicroelectronics, France; [3]STMicroelectronics & IM2NP Laboratory, France

C3L-B.5 **Linear Vt-Based Temperature Sensors with Low Process Sensitivity and Improved Power Supply Headroom 2553**
Chen Zhao[2], Jun He[2], Sheng-Huang Lee[1], Karl Peterson[2], Randall Geiger[2], Degang Chen[2]
[1]Iowa State Univeristy, United States; [2]Iowa State University, United States

C3L-C: Digital Circuit Designs I

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: EL PARDO I
Chair(s): Jun Jin Kong, *Samsung Electronics Co., Ltd.*
Vojin G. Oklobdzija, *University of Texas*

C3L-C.1 **Hardware Synchronization for Embedded Multi-Core Processors 2557**
Christian Stoif[3], Martin Schoeberl[2], Benito Liccardi[1], Jan Haase[3]
[1]BMW Group, Germany; [2]Technical University of Denmark, Denmark; [3]Technische Universität Wien, Austria

C3L-C.2 **Fast Hysteretic Control of on-Chip Multi-Phase Switched-Capacitor DC-DC Converters 2561**
Loai Salem[2], Yehea Ismail[1]
[1]Northwestern University, United States; [2]Northwestern University / Nile University, Egypt

C3L-C.3 **Dynamic Jitter Accumulation in Clock Repeaters Considering Power and Ground Noise Correlations 2565**
Monica Figueiredo[1], Rui Aguiar[2]
[1]Polytechnic Institute of Leiria, Portugal; [2]Universidade de Aveiro, Portugal

C3L-C.4 **RIRI Scheme: a Robust Instant-Responding Ratiochronous Interface with Zero-Latency Penalty 2569**
Ru Wang[1], Huandong Wang[1], Baoxia Fan[1], Liang Yang[2]
[1]Instiute of Computing Technology, Chinese Academy of Sciences, China; [2]Loongson Technologies Corporation Limited, China

C3L-C.5 **A Low-Power Cam with Efficient Power and Delay Trade-Off 2573**
Anh Tuan Do, Shoushun Chen, Zhi Hui Kong, Kiat Seng Yeo
Nanyang Technological University, Singapore

C3L-D: Circuit Designs for Reliability

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: EL PARDO II
Chair(s): Masud H Chowdhury, *University of Illinois at Chicago*
Ibrahim N. Hajj, *American University of Beirut*

C3L-D.1 **A Novel Technique to Reduce the Metastability of Bang-Bang Phase Frequency Detectors 2577**
Mohammad Javidan[3], Eldar Zianbetov[3], François Anceau[3], Dimitri Galayko[3], Eric Colinet[1], Jerome Juillard[2]
[1]CEA, LETI, Minatec, France; [2]Supélec, France; [3]UPMC Sorbonne Universités / LIP6, France

C3L-D.2 **A Tunable Soft-Error Filtering Circuit Based on Programmable-Threshold Inverters ..... NA**
Basab Datta, Wayne Burleson
University of Massachusetts-Amherst, United States

C3L-D.3 **Analysis of Delay Mismatching of Digital Circuits Caused by Common Environmental Fluctuations 2585**
Dennis Andrade[2], Antonio Rubio[2], Antonio Calomarde[2], Sorin Cotofana[1]
[1]Technische Universiteit Delft, Netherlands; [2]Universitat Politècnica de Catalunya BarcelonaTech, Spain

C3L-D.4 **All-Digital PLL Array Provides Reliable Distributed clock for SOCs 2589**
Mohammad Javidan[4], Eldar Zianbetov[4], François Anceau[4], Dimitri Galayko[4], Anton Korniienko[1], Eric Colinet[1], Gerard Scorletti[2], Jean-Michel Akré[3], Jérôme Juillard[3]
[1]CEA, LETI, Minatec, France; [2]Lyon Institut of Nanotechnologies / AMPERE, France; [3]Supélec, France; [4]UPMC Sorbonne Universités / LIP6, France

C3L-D.5 **An on-Chip Metastability Measurement Circuit to Characterize Synchronization Behavior in 65nm 2593**
Salomon Beer[2], Ran Ginosar[2], Michael Priel[1], Rostislav Dobkin[2], Avinoam Kolodny[2]
[1]Freescale Semiconductor, Israel; [2]Technion, Israel

C3L-E: Wireless, Wearable & Implantable/Injectable Technology I

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: ORIENTE
Chair(s): Manuel Delgado-Restituto, *Instituto de Microelectrónica de Sevilla*
Ghovanloo Maysam, *Georgia Tech*

C3L-E.1 **Towards an Inductively Coupled Power/Data Link for Bondpad-Less Silicon Chips...2597**
Song Luan, Amir Eftekhar, Olive Murphy, Timothy Constandinou
Imperial College London, United Kingdom

C3L-E.2 **Energy-Efficient Resonant BFSK MICS Transmitter with Fast-Settling Dual-Loop Adaptive Frequency Locking 2601**
Christoph Maier[1], Tuan-Vu Cao[2], Dag Wisland[2], Tor Sverre Lande[2], Gert Cauwenberghs[1]
[1]University of California, San Diego, United States; [2]University of Oslo, Norway

C3L-E.3 **A Bio-Implantable Platform for Inductive Data and Power Transfer with Integrated Battery Charging 2605**
Michael Sole, Ayodele Sanni, Antonio Vilches, Christofer Toumazou, Timothy Constandinou
Imperial College London, United Kingdom

C3L-E.4 **A New Omnidirectional Wireless Power Transmission Solution for the Wireless Endoscopic Micro-Ball.....2609**
Xiaomeng Li, Tianjia Sun, Guolin Li, Xiang Xie, Yingke Gu, Zhihua Wang
Tsinghua University, China

C3L-E.5 **A High-Performance Analog Front-End for an Intraoral Tongue-Operated Assistive Technology 2613**
Benoit Gosselin[2], Maysam Ghovanloo[1]
[1]Georgia Institute of Technology, United States; [2]Universite Laval, Canada

C3L-F: Encoder Optimization

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: IMPERIAL I
Chair(s): King N. Ngan, *Chinese University of Hong Kong*
Yap-Peng Tan, *Nanyang Technological University*

C3L-F.1 **Adaptive Pre-Interpolation Filter for Motion-Compensated Prediction 2617**
Jie Dong, King Ngi Ngan
Chinese University of Hong Kong, Hong Kong

C3L-F.2 **Adaptive Patch Matching for Motion Compensated Prediction.....2621**
Tianmi Chen[2], Xiaoyan Sun[1], Feng Wu[1], Guangming Shi[2]
[1]Microsoft Research Asia, China; [2]Xidian University, China

C3L-F.3 **Motion Estimation with Second Order Prediction.....2625**
Shangwen Li, Lu Yu
Zhejiang University, China

C3L-F.5 **A Novel Tracking-by-Encoding Scheme Based on Linear Programming Matching 2629**
Yang Wang, Peng Zhang, Zhen Liu, Houqiang Li
University of Science and Technology of China, China

C3L-G: Wireless Multimedia & Security

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: ALVORADA I
Chair(s): Oscar C. Au, *Hong Kong University of Science & Technology*
Min-Jen Tsai, *National Chiao Tung University*

C3L-G.1 **Source Color Laser Printer Identification Using Discrete Wavelet Transform and Feature Selection Algorithms 2633**
Min-Jen Tsai[1], Jung Liu[1], Chen-Sheng Wang[2], Ching-Hua Chuang[2]
[1]National Chiao Tung University, Taiwan; [2]Tahwa Institute of Technology, Taiwan

C3L-G.2 **Watermarking Schemes in Ordered Dither Block Truncation Coding ..... NA**
Jing-Ming Guo, Yong-Chuen Kang
National Taiwan University of Science and Technology, Taiwan

C3L-G.3 **Image Quality and Lifetime Co-Optimization in Wireless Multi-Camera Systems 2641**
Hyungkyu Kim, Jungsoo Kim, Chong-Min Kyung
Korea Advanced Institute of Science and Technology, Korea, South

C3L-G.4 **A MAXMIN Resource Allocation Approach for Scalable Video Delivery over Multiuser MIMO-OFDM Systems 2645**
Maodong Li, Zhenzhong Chen, Yap-Peng Tan
Nanyang Technological University, Singapore

C3L-H: Digital Forensics

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: ALVORADA II
Chair(s): Johann Briffa, *University of Surrey*
Anthony Ho, *University of Surrey*

C3L-H.1 **Performance Study on Block-Based Image Steganalysis 2649**
Seongho Cho[2], Byung-Ho Cha[1], Jingwei Wang[2], C.-C. Jay Kuo[2]
[1]Samsung Electronics Co. LTD., Korea, South; [2]University of Southern California, United States

C3L-H.2 **Visual Attention-Based Watermarking 2653**
Matthew Oakes, Deepayan Bhowmik, Charith Abhayaratne
University of Sheffield, United Kingdom

C3L-H.3 **Forensic Data Hiding Optimized for JPEG 2000 ..... 2657**
Dieter Bardyn[2], Johann Briffa[1], Ann Dooms[2], Peter Schelkens[2]
[1]University of Surrey, United Kingdom; [2]Vrije Universiteit Brussel & Interdisciplinary Institute for Broadband Technology, Belgium

C3L-H.4 **Image Forensic of Glare Feature for Improving Image Retrieval Using Benford's Law 2661**
Ghulam Qadir, Xi Zhao, Anthony Ho, Matthew Casey
University of Surrey, United Kingdom

C3L-H.5 **A Cauchy Distribution Based Video Watermark Detection for H.264/AVC in DCT Domain 2665**
Lina Chen[1], Gaobo Yang[1], Anthony Ho[2]
[1]Hunan University, China; [2]University of Surrey, United Kingdom

C3L-J: Neural Networks I

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: ITAMARATY I
Chair(s): Jinhu Lu, *Chinese Academy of Sciences*
Wei Xing Zheng, *University of Western Sydney*

C3L-J.1 **Information Retrieval from Large Data Sets via Multiple-Winners-Take-All 2669**
Zhishan Guo, Jun Wang
Chinese University of Hong Kong, Hong Kong

C3L-J.2 **Realtime Feature Extraction Using MAX-Like Convolutional Network for Human Posture Recognition 2673**
Bo Zhao, Shoushun Chen
Nanyang Technological University, Singapore

C3L-J.3 **Stability Analysis of SSN Biochemical Networks 2677**
Wei Su[1], Jinhu Lü[1], Maciej J. Ogorzalek[2]
[1]Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China; [2]Jagiellonian University, Poland

C3L-J.4 **An LMI Based State Estimator for Delayed Hopfield Neural Networks 2681**
Yun Chen[1], Wei Xing Zheng[2]
[1]Hangzhou Dianzi University, China; [2]University of Western Sydney, Australia

C3L-J.5 **A Study on Resistive-Type Truncated CVNS Distributed Neural Networks 2685**
Golnar Khodabandehloo, Mitra Mirhassani, Majid Ahmadi
University of Windsor, Canada

C3L-K: Circuits for Error Correcting Codes & FFT Processor Design

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: SEGOVIA I
Chair: Xinmiao Zhang, *Case Western Reserve University*

C3L-K.1 **A Novel Polynomial Selection Scheme for Low-Complexity Chase Algebraic Soft-Decision Reed-Solomon Decoding.....2689**
Xinmiao Zhang[1], Yingquan Wu[2], Jiangli Zhu[1]
[1]Case Western Reserve University, United States; [2]Link-A-Media Devices, United States

C3L-K.2 **An Area-Efficient Truncated Inversionless Berlekamp-Massey Architecture for Reed-Solomon Decoders.....2693**
Jeong-In Park[1], Hanho Lee[1], Seongsoo Lee[2]
[1]Inha University, Korea, South; [2]Soongsil University, Korea, South

C3L-K.3 **Memory Efficient Layered Decoder Design with Early Termination for LDPC Codes 2697**
Jiangpeng Li, Guanghui He, Hexi Hou, Zhejun Zhang, Jun Ma
Shanghai Jiao Tong University, China

C3L-K.4 **Memory Conflict Analysis for a Multi-Standard, Reconfigurable Turbo Decoder.....2701**
Eid M. Abdel-Hamid, Hossam A. H. Fahmy, Mohamed M. Khairy, Ahmed F. Shalash
Cairo University, Egypt

C3L-K.5 **An Area and Power Efficient Pipeline FFT Processor for 8x8 MIMO-OFDM Systems.....2705**
Shingo Yoshizawa, Atsushi Orikasa, Yoshikazu Miyanaga
Hokkaido University, Japan

C3L-M: Nonsmooth Dynamics of Electrical Systems

Time: Wednesday, May 18, 2011, 15:40 - 17:20
Room: SEGOVIA III
Chair: Soumitro Banerjee, *Indian Institute of Technology*

C3L-M.1 **Nonsmooth Dynamics of Electrical Systems 2709**
Soumitro Banerjee[1], Damian Giaouris[2], Otman Imrayed[2], Petros Missailidis[2], Bashar Zahawi[2], Volker Pickert[2]
[1]Indian Institute of Science Education & Research-Kolkata, India; [2]Newcastle University, United Kingdom

C3L-M.2 **Two-Fold Singularity in Nonsmooth Electrical Systems 2713**
Mario Di Bernardo[2], Alessandro Colombo[1], Enric Fossas[3]
[1]Massachussets Institute of Technology, United States; [2]Università degli Studi di Napoli Federico II, Italy; [3]Universitat Politècnica de Catalunya BarcelonaTech, Spain

C3L-M.3 **Bifurcation Study Ofwind Energy Generation Systems 2717**
Zhen Li, Siu-Chung Wong, Chi K. Tse
Hong Kong Polytechnic University, Hong Kong

C3L-M.4 **Trajectory Deadlock in Power System Models 2721**
Ian Hiskens
University of Michigan, United States

C3L-M.5 **Non-Smooth Bifurcations in a 1-D Piecewise Linear Model of a Single Inductor Two-Output DC-DC Switching Converter 2725**
Vanessa Moreno-Font[1], Luis Benadero[1], Abdelali El Aroudi[2]
[1]Universitat Politècnica de Catalunya BarcelonaTech, Spain; [2]Universitat Rovira i Virgili, Spain

C4P-P: Circuit Design & Optimization

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: Louvre
Chair: Baris Taskin, *Drexel University*

C4P-P.1 **Yield-Aware Template-Based Layout Retargeting for Analog Integrated Circuits .....NA**
Hao Yan, Theodore Norvell, Lihong Zhang
Memorial University of Newfoundland, Canada

C4P-P.2 **Hierarchical Symbolic Sensitivity Computation with Applications to Large Amplifier Circuit Design 2733**
Xiaopeng Li[1], Hui Xu[1], Guoyong Shi[1], Andy Tai[2]
[1]Shanghai Jiao Tong University, China; [2]Synopsys, Inc., United States

C4P-P.3 **Optimization of Area in Digit-Serial Multiple Constant Multiplications at Gate-Level 2737**
Levent Aksoy[1], Cristiano Lazzari[1], Eduardo Costa[2], Paulo Flores[1], Jose Monteiro[1]
[1]INESC-ID / Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal; [2]Universidade Católica de Pelotas, Brazil

C4P-P.4 **Parallel Multi-Level Simulation of Wireless Sensor Networks.....2741**
Mario Lang, Jan Haase, Christoph Grimm
Technische Universität Wien, Austria

C4P-P.5 **A Novel Finite-Wordlength Particle Swarm Optimization Technique for FRM IIR Digital Filters.....2745**
Seyyed Ali Hashemi, Behrouz Nowrouzian
University of Alberta, Canada

C4P-Q: Wireless Circuits & Systems

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: Louvre
Chair: Kwen-Siong Chong, *Nanyang Technological University*

C4P-Q.1 **A High Gain Flatness High Linearity Down Conversion Mixer for Ku Band Application 2749**
Ro-Min Weng, Ming-Jhe Zeng, Chun-Yu Liu
National Dong Hwa University, Taiwan

C4P-Q.2 **MPEG-4 Codec Based Uplink Resource Allocation Scheme for the Video Telephony Service in WiBro/WiMAX Systems 2753**
Ji-Su Kim[1], Joongho Choi[2], Jae-Hyun Kim[1]
[1]Ajou University, Korea, South; [2]University of Seoul, Korea, South

C4P-Q.3 **A Pipelined 3-Level Bandpass Delta-Sigma Modulator for Class-S Power Amplifiers 2757**
Martin Schmidt, Sebastian Haug, Markus Grözing, Manfred Berroth
Universität Stuttgart, Germany

C4P-Q.4 **Analysis of the Envelope and the Instantaneous Phase and Frequency of Superregenerative Oscillators 2761**
Jordi Bonet-Dalmau, Pere Palà-Schönwälder, Francisco del Águila-López, Rosa Giralt-Mas, Francesc Xavier Moncunill-Geniz
Universitat Politècnica de Catalunya BarcelonaTech, Spain

C4P-Q.5 **A Power Scalable Receiver Front-End at 2.4 GHz 2765**
Kaushik Ghosal, Sankaragomat A Kannan, Bharadwaj Amrutur
Indian Institute of Science, India

C4P-R: Power Converter IV

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Ke-Horng Chen, *National Chiao Tung University*
Soumitro Banerjee*, Indian Institute of Technology*

C4P-R.1 **A Grounded-Output 5-Switch Bipolar Buck-Boost Converter Topology for Switching Power Amplifiers 2769**
Albert Garcia i Tormo, Alberto Poveda, Eduard Alarcón, Francesc Guinjoan
Universitat Politècnica de Catalunya BarcelonaTech, Spain

C4P-R.2 **A Single-Stage Three-Phase High Power Factor Rectifier with High-Frequency Isolation and Regulated DC-Bus Based on the DCM SEPIC Converter 2773**
Gabriel Tibola, Ivo Barbi
Universidade Federal de Santa Catarina, Brazil

C4P-R.3 **A Single Stage Buck-Boost Three-Phase Rectifier with High Power Factor Operating in Continuous Conduction Mode (CCM) 2777**
Altamir Borges, Ivo Barbi
Universidade Federal de Santa Catarina, Brazil

C4P-R.4 **Dynamic Oversampling Ratio Sigma-Delta Modulation for the Control of Switching Power Converter 2781**
Simone Orcioni, Rocco d'Aparo, Giorgio Crostella, Davide Nicoletti, Massimo Conti
Università Politecnica delle Marche, Italy

C4P-R.5 **Maximum Drain Efficiency Class F3 RF Power Amplifier 2785**
Marian Kazimierczuk, Rafal Wojda
Wright State University, United States

C4P-S: Visual Signal Analysis, Processing & Rendering

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Lap-Pui Chau, *Nanyang Technological University*
Yap-Peng Tan, *Nanyang Technological University*

C4P-S.1 **A New Temporal-Constraint-Based Algorithm by Handling Temporal Qualities for Video Enhancement 2789**
Jun Xie[2], Weiyao Lin[2], Hongxiang Li[1], Ning Xu[2], Hongyu Gao[2], Lining Zhang[2]
[1]North Dakota State University, United States; [2]Shanghai Jiao Tong University, China

C4P-S.2 **Semi-Aperiodic Dot Diffusion ..... NA**
Yun Fu Liu, Jing-Ming Guo
National Taiwan University of Science and Technology, Taiwan

C4P-S.3 **An Image Retrieval System Using Shape Salience Points 2797**
Glauco Vitor Pedrosa[2], Celia Zorzo Barcelos[2], Marcos Aurélio Batista[1]
[1]Universidade Federal de Goiás, Brazil; [2]Universidade Federal de Uberlândia, Brazil

C4P-S.4 **Realistic and Interactive Image-Based Rendering of Ancient Chinese Artifacts Using a Multiple Camera Array 2801**
Chong Wang[2], Zhenyu Zhu[2], Shing-Chow Chan[2], Harry Y. Shum[1]
[1]Microsoft Corporation, United States; [2]University of Hong Kong, Hong Kong

C4P-S.5 **Fast Disparity Estimation Utilizing Depth Information for Multiview Video Coding 2805**
Zongmei Qiao[1], Xiaoming Li[1], Debin Zhao[1], Yanwei Liu[2], Wen Gao[2]
[1]Harbin Institute of Technology, China; [2]Institute of Computing Technology / Chinese Academy of Science, China

C4P-T: **Sensory Systems**
Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: Louvre
Chair(s): Amine Bermak, *Hong Kong University of Science & Technology*
Piotr Dudek, *University of Manchester*

C4P-T.1 **Embedded System for Monitoring the Comfort in Public Transportation 2809**
Juan Camilo Castellanos, Fabiano Fruett
Universidade Estadual de Campinas, Brazil

C4P-T.2 **Attentive Motion Sensor for Mobile Robotic Applications 2813**
Chiara Bartolozzi[1], Neeraj Mandloi[1], Giacomo Indiveri[2]
[1]Italian Institute of Technology, Italy; [2]University of Zurich/ETH Zurich, Switzerland

C4P-T.3 **Effective Hand Posture Recognition System with Hierarchical-Feature Adaboosting and Feature Reserving Average Mask ..... NA**
Jing-Ming Guo, Hoang-Son Nguyen
National Taiwan University of Science and Technology, Taiwan

C4P-T.4 **ETSSI: Energy-Based Task Scheduling Simulator for Wireless Sensor Networks 2821**
Sherine Abdelhak, Chandra Sekhar Gurram, Jared Tessier, Soumik Ghosh, Magdy Bayoumi
University of Louisiana at Lafayette, United States

C4P-T.5 **A Low-Complexity Image Compression Algorithm for Address-Event Representation (AER) PWM Image Sensors 2825**
Denis Guangyin Chen, Amine Bermak, Chi Ying Tsui
Hong Kong University of Science and Technology, Hong Kong

C4P-T.6 **Hardware Implementation of a Centroid-Based Localization Algorithm for Mobile Sensor Networks 2829**
Leonardo Oliveira[3], Gustavo Dessbesell[2], João Baptista Martins[3], José Monteiro[1]
[1]INESC-ID / Instituto Superior Técnico, Universidade Técnica de Lisboa, Portugal; [2]Santa Maria Design House, Brazil; [3]Universidade Federal de Santa Maria, Brazil

C4P-U: Oscillators & Mixers

Time: Wednesday, May 18, 2011, 10:30 - 12:10
Room: Louvre
Chair: Fa Foster Dai, *Auburn University*

C4P-U.1 **Linearity Analysis of CMOS Passive Mixer 2833**
Tsung-Te Liu, Jan Rabaey
University of California, Berkeley, United States

C4P-U.2 **A Relaxation Oscillator with Multi-Phase Triangular Waveform Generation 2837**
Hang Lv, Bo Zhou, Woogeun Rhee, Yongming Li, Zhihua Wang
Tsinghua University, China

C4P-U.3 **A 4.2-4.7GHz, 3.7mW Digitally Controlled Oscillator RFIC 2841**
Vasanth Kakani, Foster Dai
Auburn University, United States

C4P-U.4 **A Digitally Controlled Oscillator in a 65-nm CMOS Process for SoC Clock Generation 2845**
Eldar Zianbetov[3], François Anceau[3], Mohammad Javidan[3], Dimitri Galayko[3], Eric Colinet[1], Jerome Juillard[2]
[1]CEA, LETI, Minatec, France; [2]Supélec, France; [3]UPMC Sorbonne Universités / LIP6, France

C4P-U.5 **Analog CMOS Circuit Implementation of a System of Pulse-Coupled Oscillators for Spike-Based Computation 2849**
Kenji Matsuzaka, Kazuki Nakada, Takashi Morie
Kyushu Institute of Technology, Japan

C5P-P: CAD Algorithms

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: Louvre
Chair: Matthew Guthaus, *University of California Santa Cruz*

C5P-P.1 **Process-Variation-Aware Electromagnetic-Semiconductor Coupled Simulation.....2853**
Yuanzhe Xu, Quan Chen, Lijun Jiang, Ngai Wong
University of Hong Kong, Hong Kong

C5P-P.2 **A Novel Method of Synthesizing Reversible Logic.....2857**
Yu Pang[1], Jinzhao Lin[1], Sayeeda Sultana[2], Katarzyna Radecka[2]
[1]Chongqing University of Posts and Telecommunications, China; [2]McGill University, Canada

C5P-P.3 **Communication-Aware Design Flow for Dependable Networked Embedded Systems.....2861**
Franco Fummi, Davide Quaglia, Francesco Stefanni
Università degli studi di Verona, Italy

C5P-P.4 **Machine-Learning Framework for Automatic Netlist Creation 2865**
Mohamed Badreddine, Yves Blaquière, Mounir Boukadoum
Université du Québec À Montréal, Canada

C5P-P.5 **A Novel Representation for Repeated Placement.....2869**
Kunihiro Fujiyoshi, Keisuke Ishihara, Tan Wei Liang
Tokyo University of Agriculture and Technology, Japan

C5P-Q: Millimeter-wave Circuits, Optical Circuits & Synthesizer for Communications Systems

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: Louvre
Chair: Hassan Aboushady, *University of Pierre & Marie Curie*

C5P-Q.1 **A Low-Spurious Fast Hopping 12-Band Synthesizer for Dual-Carrier MB-OFDM UWB Applications ..... NA**
Haipeng Fu, Deyun Cai, Danfeng Chen, Junyan Ren, Wei Li, Ning Li
Fudan University, China

C5P-Q.2 **A Low-Power ESD-Protected 24GHz Receiver Front-End with pi-Type Input Matching Network 2877**
Hongrui Wang, Chao Jiao, Li Zhang, Dajie Zeng, Dongxu Yang, Yan Wang, Zhiping Yu
Tsinghua University, China

C5P-Q.3 **An Analog (7,5) Convolutional Decoder in 65 nm CMOS for Low Power Wireless Applications 2881**
Reza Meraji, John B. Anderson, Henrik Sjöland, Viktor Öwall
Lund University, Sweden

C5P-Q.4 **Understanding Dynamic Behavior of mm-Wave CML Divider with Injection-Locking Concept 2885**
Hongrui Wang[2], Dajie Zeng[1], Dongxu Yang[2], Li Zhang[2], Lei Zhang[2], Yan Wang[2], He Qian[2], Zhiping Yu[2]
[1]Sinano, Chinese Academy of Sciences, China; [2]Tsinghua University, China

C5P-Q.5 **A 1.93 pA/sqrt(Hz) Transimpedance Amplifier for 2.5 Gb/S Optical Communications 2889**
Shahab Shahdoost[2], Ali Medi[2], Namdar Saniei[1]
[1]Shahid Beheshti University, Iran; [2]Sharif University of Technology, Iran

C5P-R: Integrated Power Converter

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: Louvre
Chair(s): Ke-Horng Chen, *National Chiao Tung University*
Hirotaka Koizumi, *Tokyo University of Science*

C5P-R.2 **Quasi-Hysteretic Floating Buck LED Driver with Adaptive Off-Time for Accurate Average Current Control in High Brightness Lighting 2893**
Sandip Uprety, Hai Chen, Dongsheng Ma
University of Texas at Dallas, United States

C5P-R.3 **A Sub-100nA Power Management System for Wireless Structure Health Monitoring Applications 2897**
Zhangcai Huang[1], Yasuaki Inoue[2]
[1]Fukuoka Industry, Science & Technology Foundation, Japan; [2]Waseda University, Japan

C5P-R.5 **Design of an LFR Based on a SEPIC Converter Under Sliding Mode Control for HBLEDs Applications 2901**
Mirko Bodetto, Angel Cid-Pastor, Luis Martínez-Salamero, Abdelali El Aroudi
Universitat Rovira i Virgili, Spain

C5P-S: Advanced Video Coding

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: Louvre
Chair(s): Gwo-Giun Lee, *National Cheng Kung University*
Shipeng Li, *Microsoft Research Asia*

C5P-S.1 **Distributed Residual Coding for Multi-View Video with Joint Motion Vector Projection and 3-D Warping 2905**
Quanfu Zhang, Qiwei Liu, Houqiang Li
University of Science and Technology of China, China

C5P-S.2 **Complexity-Constrained Rate-Distortion Optimization for H.264/AVC Video Coding 2909**
Tiago da Fonseca, Ricardo de Queiroz
Universidade de Brasilia, Brazil

C5P-S.3 **Smoothing Rate Control for Multiple Video Streams Using Game Theory 2913**
Meng Liu, Houqiang Li, Weiping Li
University of Science and Technology of China, China

C5P-S.4 **Side Information Extrapolation with Temporal and Spatial Consistency 2918**
Xianming Liu[1], Deming Zhai[1], Debin Zhao[1], Ruiqin Xiong[2], Siwei Ma[2], Wen Gao[2]
[1]Harbin Institute of Technology, China; [2]Peking University, China

C5P-S.5 **A Scheme of Parallel Arithmetic Coding 2922**
Wei Xiao[2], You Zhou[1], Jizheng Xu[1], Guangming Shi[2]
[1]Microsoft Research Asia, China; [2]Xidian University, China

C5P-T: Nanoscale & Gigaspeed Devices: Circuits & Systems

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: Louvre
Chair: Garrett Rose, *New York University*

C5P-T.1 **A New Synthesis Methodology for Reliable RF Front-End Design 2926**
Pietro Maris Ferreira, Hervé Petit, Jean-François Naviner
Institut TELECOM, TELECOM ParisTech, CNRS LTCI, ParisTech, France

C5P-T.2 **Evaluation of a Crossbar Multiplexer in a Lithography-Based Nanowire Technology 2930**
Pierre-Emmanuel Gaillardon[1], Haykel Ben-Jamaa[1], Fabien Clermidy[1], Ian O'Connor[2]
[1]CEA, LETI, Minatec, France; [2]Lyon Institut of Nanotechnologies, France

C5P-T.3 **A Reconfigurable and Deadlock-Free Routing Algorithm for 2D Mesh Network-on-Chip 2934**
Zewen Shi, Yueming Yang, Xiaoyang Zeng, Zhiyi Yu
Fudan University, China

C5P-T.4 **A Read-Monitored Write Circuit for 1T1M Multi-Level Memristor Memories 2938**
Harika Manem, Garrett S. Rose
Polytechnic Institute of New York University, United States

C5P-T.5 **Exploiting Memristance for Low-Energy Neuromorphic Computing Hardware 2942**
Garrett S. Rose[2], Robinson Pino[1], Qing Wu[1]
[1]Air Force Research Laboratory, United States; [2]Polytechnic Institute of New York University, United States

C5P-U: Memristor & Chaotic Circuits

Time: Wednesday, May 18, 2011, 13:40 - 15:20
Room: Louvre
Chair: Cem Goknar, *Dogus University*

C5P-U.1 **Chaos Control in a Memristor Based Circuit 2946**
Herbert Ho-Ching Iu[2], Dong-Sheng Yu[1], Andrew Lewis Fitch[2], Victor Sreeram[2]
[1]China University of Mining and Technology, China; [2]University of Western Australia, Australia

C5P-U.2 **On the Trade-Off Between the Number of Scrolls and the Operating Frequency of the Chaotic Attractors 2950**
Carlos Sánchez-López[1], Jesus Manuel Muñoz-Pacheco[3], Esteban Tlelo-Cuautle[2], Victor Hugo Carbajal-Gómez[2], Rodolfo Trejo-Guerra[2]
[1]IMSE-CNM, CSIC and Universidad de Sevilla, Spain; [2]INAOE, Mexico; [3]UPUE, Mexico

C5P-U.4 **CMOS Interface Circuits for Reading and Writing Memristor Crossbar Array 2954**
Muhammad Shakeel Qureshi, Matthew Pickett, Feng Miao, John Paul Strachan
Hewlett-Packard, United States

Author Index