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Time: Monday, June 2, 2014, 15:00 - 16:30

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¹*HORIBA, Ltd., Japan*; ²*NTT Advanced Technology Corporation, Japan*; ³*Tokyo Institute of Technology, Japan*

B1L-C: Visual Signal Analysis and Assessment

Time: Tuesday, June 3, 2014, 08:00 - 09:30

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¹*Chunghwa Picture Tubes, Ltd., Taiwan*; ²*Industrial Technology Research Institute, Taiwan*; ³*Metal Industries Research & Development Centre, Taiwan*; ⁴*National Chiao Tung University, Taiwan*; ⁵*Realtek Semiconductor Corp., Taiwan*
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¹Hiroshima Institute of Technology, Japan; ²Hiroshima University, Japan; ³University of Victoria, Canada

B1L-H: Low Power Circuits I

Time: Tuesday, June 3, 2014, 08:00 - 09:30
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- B1L-K03** **Low-Rate Identification of Memory Polynomials** 1034
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¹*Indian Institute of Science Education and Research, Kolkata, India*; ²*King Abdulaziz University, Saudi Arabia*; ³*Newcastle University, Greece*

B1L-L: SPECIAL SESSION: Giga-Scale System Design Using Emerging Nonvolatile Memories

Time: Tuesday, June 3, 2014, 08:00 - 09:30
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Tuo-Hung Hou, *National Chiao Tung University*

- B1L-L01** **Hybrid Solid-State Storage System with Storage Class Memory and NAND Flash Memory for Big-Data Application 1046**
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Chuo University, Japan
- B1L-L02** **Register Allocation for Hybrid Register Architecture in Nonvolatile Processors 1050**
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Huazhong Yang²
¹*City University of Hong Kong, China*; ²*Tsinghua University, China*; ³*Wuhan University, China*
- B1L-L03** **ReRAM-Based Synaptic Device for Neuromorphic Computing 1054**
Jun-Woo Jang², Sangsu Park¹, Yoon-Ha Jeong², Hyunsang Hwang²
¹*Gwangju Institute of Science and Technology, Korea, South*; ²*Pohang University of Science and Technology, Korea, South*
- B1L-L04** **Orientation Classification by a Winner-Take-All Network with Oxide RRAM Based Synaptic Devices 1058**
Shimeng Yu
Arizona State University, United States

B2L-A: SPECIAL SESSION: Memristive Neuromorphic Systems

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Omid Kavehei, *University of Melbourne*

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¹Arizona State University, United States; ²Stanford University, United States
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*¹Politecnico di Torino, Italy; ²University of California, San Diego, United States;
³University of South Carolina, United States*
- B2L-A04** **Spin-Transfer Torque Magnetic Memory as a Stochastic Memristive Synapse 1074**
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Romdhane², Olivier Bichler¹, Christian Gamrat¹, Jacques-Olivier Klein², Sylvie
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*¹Atomic Energy and Alternative Energies Commission, France; ²Paris-Sud
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University of Michigan, United States

B2L-B: Wireless Circuit Technology for Bio-applications II

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Julius Georgiou, *University of Cyprus*

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- B2L-B02** **A Low-Power Reconfigurable CMOS Power Amplifier for Wireless Sensor
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- B2L-B03** **An Integrated Coil Driver with Discrete Control and Power Efficient Ask
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¹*National University of Singapore, Singapore*; ²*Tsinghua University, China*
- B2L-B05** **A Novel Fully Integrated Low-Power CMOS BPSK Demodulator for Medical
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¹*Harbin Institute of Technology, China*; ²*Peking University, China*
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- B2L-C03 Simplified Depth Intra Mode Selection for 3D Video Compression..... 1110**
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¹*Academia Sinica, Taiwan*; ²*Intel Corporation, United States*; ³*National Taiwan University, Taiwan*

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- B2L-D02** **A Single-Ended Disturb-Free 5T Loadless SRAM with Leakage Sensor and Read Delay Compensation Using 40 nm CMOS Process 1126**
Chua-Chin Wang, Chiang-Hsiang Liao, Sih-Yu Chen
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- B2L-D03** **Investigation and Optimization of Monolithic 3D Logic Circuits and SRAM Cells Considering Interlayer Coupling 1130**
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Gabor Temes, *Oregon State University*

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¹*Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France;*
²*STMicroelectronics, France*
- B2L-E02** **A Low-Power 10-Bit 40-MS/s Pipeline ADC Using Extended Capacitor Sharing..... 1147**
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B2L-F: Smart Grids, Modelling and Power Converters

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- B2L-F01** **Application of Wolf Group Hierarchy Optimization Algorithm to Fault Section Estimation in Power Systems** 1163
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¹*James Cook University, Australia*; ²*University of Adelaide, Australia*; ³*University of Adelaide, Australia*
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¹*Institut Polytechnique de Grenoble, France*; ²*Siemens T&D, France*; ³*Université Joseph Fourier, France*
- B2L-F05** **RMS Voltage Control with Harmonic Compensation for Parallel-Connected Inverters Feeding Non-Linear Loads** 1179
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Chair(s): Yajun Yu, *Nanyang Technological University*
Zhiping Lin, *Nanyang Technological University*

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An-Kai Li³, Sheau-Fang Lei³, Wen-Kai Tsai¹, Shin-Chi Lai²
¹*Information and Communications Research Laboratories, Industrial Technology Research Institute, Taiwan*; ²*Nan Hua University, Taiwan*; ³*National Cheng Kung University, Taiwan*

B2L-H: Low Power Circuits II

Time: Tuesday, June 3, 2014, 11:00 - 12:30

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Chair(s): Izzet Kale, *University of Westminster*

Malgorzata Chrzanowska-Jeske, *Portland State University*

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- B2L-H04** **A Power-Efficient Pulse-Based in-Situ Timing Error Predictor for PVT-Variation Sensitive Circuits 1215**
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¹*Infineon Technologies AG, Germany;* ²*Technische Universität Dresden, Germany*

B2L-J: VLSI Programmable, Reconfigurable & Array Architecture

Time: Tuesday, June 3, 2014, 11:00 - 12:30

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- B2L-J03 Map-Reduce Inspired Loop Parallelization on CGRA 1231**
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¹Imperial College London, United Kingdom; ²Tsinghua University, China
- B2L-J04 Simulation-Based Memory Dependence Checker for CGRA-Mapped Code Verification 1235**
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- B2L-J05 Remote Dynamically Reconfigurable Platform Using NetFPGA 1239**
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Time: Tuesday, June 3, 2014, 11:00 - 12:30

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¹*Universitat Politècnica de Catalunya, Spain*; ²*University College Dublin, Ireland*
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¹*Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France*;
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Michael Small, *The University of Western Australia*

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¹*Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China;* ²*Henan University, China;* ³*Henan University / Royal Melbourne Institute of Technology, China;* ⁴*RMIT University, Australia*
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B3P-N: DSP Applications

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

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M. Omair Ahmad, *Concordia University*

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¹*Cadence Design Systems, United States*; ²*Interphase Corporation, United States*;
³*Texas Instruments Inc., United States*
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¹*Concordia University, Canada*; ²*University of Hong Kong, Hong Kong*

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Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Pramod Kumar Meher, *Nanyang Technological University*
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- B3P-P03** **A Blind Frequency Response Mismatch Correction Algorithm for 4-Channel Time-Interleaved ADC 1304**
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¹*National Taiwan University, Taiwan*; ²*Tzu-Chi University, Taiwan*

B3P-Q: Data Convertors II

Time: Tuesday, June 3, 2014, 15:00 - 16:30
Room: Main Foyer
Chair(s): Shahriar Mirabbasi, *University of British Columbia*
Nuno Paulino, *New University of Lisbon*

- B3P-Q01** **Perturbation-Based Digital Background Calibration Technique for Pipelined ADCs** **1316**
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- B3P-Q03** **A 1-1 MASH 2-D Vernier Time-to-Digital Converter with 2nd-Order Noise Shaping...** **1324**
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- B3P-Q04** **A 20-MHz BW 75-dB SFDR Shifted-Averaging VCO-Based Delta-Sigma Modulator..** **1328**
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¹*Hitachi, Ltd., Japan*; ²*Hitachi. Ltd., Japan*

B3P-R: Data Convertors III

Time: Tuesday, June 3, 2014, 15:00 - 16:30
Room: Main Foyer
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Shu-Chuan Huang, *Tatung University*

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B3P-S: **Amplifiers and RF Circuits**

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Room: Main Foyer

Chair(s): Andreas Demosthenous, *University College London*
Ge Tong, *Nanyang Technological University*

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¹*New Mexico State University, United States;* ²*Universidad de Zaragoza, Spain*
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¹*National Cheng Kung University, Taiwan;* ²*National Taipei University, Taiwan*
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¹*New Mexico State University, United States;* ²*Universidad de Sevilla, Spain;* ³*Universidad Pública de Navarra, Spain*
- B3P-S04** **Multi-Band RF Time Delay Element Based on Frequency Translation** 1368
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¹*INESC-ID, Portugal;* ²*INESC-ID / Instituto Superior Técnico / Universidade de Lisboa, Portugal;* ³*INESC-ID / UNINOVA, Portugal;* ⁴*Universidade Nova de Lisboa / UNINOVA, Portugal*
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B3P-T: Novel Bio-medical Circuits

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Sandro Carrara, *École Polytechnique Fédérale de Lausanne*

- B3P-T01** **A High Voltage Zero-Static Current Voltage Scaling ADC Interface Circuit for Micro-Stimulator** 1380
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¹Hong Kong University of Science and Technology, Hong Kong; ²Universidade de Macau, Macau
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- B3P-T03** **An Analogue Instantaneous Median Frequency Tracker for EMG Fatigue Monitoring** 1388
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B3P-U: Wireless Technology for Bio-applications

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Sameer Sonkusale, *Tufts University*

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- B3P-U03** **An Adaptive Wireless Powering and Data Telemetry System for Optic Nerve Stimulation..... 1404**
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Universidade Federal de Santa Catarina, Brazil
- B3P-U05** **Solar and Thermal Energy Harvesting with a Wearable Jacket..... 1412**
Quinn Brogan, Thomas O'Connor, Dong Sam Ha
Virginia Polytechnic Institute and State University, United States

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Room: Main Foyer

Chair(s): Sorin Cotofana, *TU Delft*
Robert Chang, *National Chung Hsing University*

- B3P-V01 Novel Grid-Based Power Routing Scheme for Regular Controllable-Polarity FET Arrangements 1416**
Odysseas Zografos, Pierre-Emmanuel Gaillardon, Giovanni De Micheli
École Polytechnique Fédérale de Lausanne, Switzerland
- B3P-V02 Simulation of TaOx-Based Complementary Resistive Switches by a Physics-Based Memristive Model 1420**
Anne Siemon², Stephan Menzel¹, Astrid Marchewka², Yoshifumi Nishi³, Rainer Waser², Eike Linn²
¹*Forschungszentrum Jülich GmbH, Germany*; ²*Rheinisch-Westfälische Technische Hochschule Aachen, Germany*; ³*Toshiba Corporation, Japan*
- B3P-V03 Novel Single-Electron Information-Processing Circuits Mimicking Behavior of Ant Groups 1424**
Yuji Obi, Takahide Oya
Yokohama National University, Japan
- B3P-V04 Origin of Stochastic Resistive Switching in Devices with Phenomenologically Identical Initial States 1428**
Qingjiang Li¹, Ali Khat², Iulia Salaoru², Hui Xu¹, Themistoklis Prodromakis²
¹*National University of Defense Technology, China*; ²*University of Southampton, United Kingdom*
- B3P-V05 State Dependent Statistical Timing Model for Voltage Scaled Circuits 1432**
Aras Pirbadian, Muhammad S Khairy, Ahmed M Eltawil, Fadi J Kurdahi
University of California, Irvine, United States

B4P-N: Computer-Aided Network Design III

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Mineo Kaneko, *Japan Advanced Institute of Science and Technology*

- B4P-N01** **Linear and Bi-Linear Interpolation Circuits Using Selector Logics and Their Evaluations** 1436
Masashi Shio, Masao Yanagisawa, Nozomu Togawa
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- B4P-N02** **A 2.5GHz ADPLL with PVT-Insensitive Delta-Sigma Dithered Time-to-Digital Conversion by Utilizing an ADDLL**..... 1440
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- B4P-N03** **An Effective Iterative Density Aware Detailed Placement Algorithm**..... 1444
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- B4P-N04** **Constrained Binding and Scheduling of Triplicated Algorithm for Fault Tolerant Datapath Synthesis** 1448
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- B4P-N05** **CMOS Inverter Analytical Delay Model Considering All Operating Regions**..... 1452
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Room: Main Foyer

Chair(s): Paulo Flores, *IST / INESC-ID*

- B4P-P01** **ECHO: a Novel Method for the Multiplierless Design of Constant Array Vector Multiplication** 1456
Levent Aksoy¹, Paulo Flores², José Monteiro¹
¹INESC-ID, Portugal; ²INESC-ID / Universidade Técnica de Lisboa, Portugal
- B4P-P02** **Scan-Based Attack on the LED Block Cipher Using Scan Signatures** 1460
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Waseda University, Japan
- B4P-P03** **Genetic Algorithm Based Test Set Customization Technique Targeting Better Fault Diagnosis**..... B#5
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¹Broadcom Corporation, India; ²Indian Institute of Technology Kharagpur, India; ³Synopsys Inc., United States
- B4P-P04** **Abstracting Single Event Transient Characteristics Variations Due to Input Patterns and Fan-Out** 1468
Ghaith Bany Hamad², Syed Rafay Hasan³, Otmane Ait Mohamed¹, Yvon Savaria²
¹Concordia University, Canada; ²École Polytechnique de Montréal, Canada; ³Tennessee Technological University, United States
- B4P-P05** **SimParallel: a High Performance Parallel SystemC Simulator Using Hierarchical Multi-Threading**..... 1472
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Samsung Electronics Co., Ltd., Korea, South

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Room: Main Foyer

Chair(s): Magdy Bayoumi, *University of Louisiana at Lafayette*

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Beijing Jiaotong University, China
- B4P-Q02** **ESD Protection Design for Wideband RF Applications in 65-nm CMOS Process..... 1480**
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¹*National Chiao Tung University, Taiwan*; ²*National Taiwan Normal University, Taiwan*; ³*Taiwan Semiconductor Manufacturing Company, Taiwan*
- B4P-Q03** **A Decision Feedback Equalizer with Channel-Dependent Power Consumption for 60-GHz Receivers 1484**
Ilias Sourikopoulos², Antoine Frappé², Andreas Kaiser², Laurent Clavier¹
¹*Institut Mines-Télécom, France*; ²*Institut Supérieur de l'Electronique et du Numérique, France*
- B4P-Q04** **A 12.5-Gb/s Near-GND Transceiver for Wire-Line UHD Video Interfaces 1488**
Seok Kim², Jung-Myung Kang², Xuefan Jin², Se-Ung Park², Ja-Hoon Jin², Kee-Won Kwon², Jung-Hoon Chun², Jung Ho Lee¹, Jun Young Park¹, Dae Young Lee¹
¹*Samsung Electronics Co., Ltd., Korea, South*; ²*Sungkyunkwan University, Korea, South*
- B4P-Q05** **A 20-Gb/s 1.27pJ/b Low-Power Optical Receiver Front-End in 65nm CMOS 1492**
Gyu-Seob Jeong², Hankyu Chi², Kyungock Kim¹, Deog-Kyoon Jeong²
¹*Electronics and Telecommunication Research Center, Korea, South*; ²*Seoul National University, Korea, South*
- B4P-Q06** **Highly Flexible Active Notch Filter for Cognitive Radio..... 1496**
Raafat Lababidi¹, F. Le Roy¹, A. Mansour¹, B. Jarry³, A. Louzir²
¹*École Nationale Supérieure de Techniques Avancées de Bretagne, France*; ²*Technicolor R&D, France*; ³*Université de Limoges, France*

B4P-R: Circuits & Systems for Communications II

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Chair(s): Magdy Bayoumi, *University of Louisiana at Lafayette*

- B4P-R01** **Zero Power 4.95Gbps HDMI Transmitter..... 1500**
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- B4P-R02** **Low-Latency Wireless LAN System Using Polling-Based MAC 1504**
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- B4P-R03** **5-GHz SiGe Linearity Power Amplifier Using Integrated Feedforward Architecture
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Zong Juang³
¹*National Applied Research Laboratories/National Chip Implementation Center,
Taiwan;* ²*National Central University, Taiwan;* ³*National Chip Implementation Center,
Taiwan*
- B4P-R04** **A Theoretical Study of the Statistical and Spectral Properties of Polar
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Mohamed Ibrahim, Bin Yang
Universität Stuttgart, Germany
- B4P-R05** **A 20-Gbps Low Jitter Analog Clock Recovery Circuit for Ultra-Wide Band Radio
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B4P-S: VLSI Programmable Array and Signal Processing Circuits

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Tian-Sheuan Chang, *National Chiao Tung University*
Jun Jin Kong, *Samsung Electronics Co*

- B4P-S01** **A Variation Tolerant Driving Technique for All-Digital Self-Timed 3-Level Signaling High-Speed SerDes Transceivers for on-Chip Networks 1520**
Ramy Tadros¹, Abdelrahman Elsayed², Maged Ghoneima¹, Yehea Ismail¹
¹American University in Cairo, Egypt; ²American University in Cairo / Zewail City of Science and Technology, Egypt
- B4P-S03** **Reconfiguration Network Design for SEU Recovery in FPGAs 1524**
Ediz Cetin, Oliver Diessel, Lingkan Gong, Victor Lai
University of New South Wales, Australia
- B4P-S04** **Image Recognition System Using an Optical Fourier Transform on a Dynamically Reconfigurable Vision Architecture 1528**
Yuki Kamikubo, Minoru Watanabe, Shoji Kawahito
Shizuoka University, Japan

B4P-T: VLSI Datapath & Arithmetic Circuits II

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Liang Liu, *Lund University*

Kwen Siong Chong, *Nanyang Technological University*

- B4P-T01** **Pipeline Scanning Architecture with Computation Reduction for Rectangle Pattern Matching in Real-Time Traffic Sign Detection** 1532
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- B4P-T02** **Optimized Cubic Chebyshev Interpolator for Elementary Function Hardware Implementations** 1536
Masoud Sadeghian¹, James E. Stine Jr. ¹, E. George Walters III²
¹*Oklahoma State University, United States*; ²*Penn State Erie, The Behrend College, United States*
- B4P-T03** **Area-Efficient and Fast Sign Detection for Four-Moduli Set RNS $\{2n-1, 2^n, 2^{n+1}, 2^{(2n)+1}\}$** 1540
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- B4P-T04** **Image Processing Using Approximate Datapath Units**..... 1544
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- B4P-T05** **Design of a 5 GS/s Fully-Digital Digital-to-Analog Converter** 1548
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B4P-U: Neural Networks and Systems II

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

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Shantanu Chakrabartty, *Michigan State University*

- B4P-U01** **A Fast Deep Learning System Using GPU** 1552
Zhilu Chen², Jing Wang¹, Haibo He¹, Xinming Huang²
¹*University of Rhode Island, United States*; ²*Worcester Polytechnic Institute, United States*
- B4P-U02** **An AER Handshake-Less Modular Infrastructure PCB with x8 2.5Gbps LVDS Serial Links** 1556
Taras Iakymchuk³, Alfredo Rosado³, Teresa Serrano-Gotarredona¹, Bernabé Linares-Barranco¹, Angel Jiménez-Fernández², Alejandro Linares-Barranco², Gabriel Jiménez-Moreno²
¹*Instituto de Microelectrónica de Sevilla-CNM / CSIC-Universidad de Sevilla, Spain*; ²*Universidad de Sevilla, Spain*; ³*Universitat de València, Spain*
- B4P-U03** **A Biomimetic Nanoelectronic Neuron with Enhanced Spike Timing** 1560
Chih-Chieh Hsu, Alice Parker
University of Southern California, United States
- B4P-U04** **A Generalised Conductance-Based Silicon Neuron for Large-Scale Spiking Neural Networks** 1564
Runchun Wang, Tara Julia Hamilton, Jonathan Tapson, André van Schaik
University of Western Sydney, Australia
- B4P-U05** **Silicon Neuron Dedicated to Memristive Spiking Neural Networks** 1568
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¹*L'Université de Bordeaux, France*; ²*Unit Mixte de Physique CNRS/Thales, France*; ³*Université Bordeaux, France*

B4P-V: Neural Networks and Systems III

Time: Tuesday, June 3, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Xavier Vilasis Cardona, *University Ramon Llull of Barcelona*
Shih-Chii Liu, *Institute of Neuroinformatics ETHZ-INI*

- B4P-V01** **A 7-Transistor-Per-Cell, High-Density Analog Storage Array with 500 μ v Update Accuracy and Greater Than 60dB Linearity..... 1572**
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- B4P-V02** **The Accuracy and Scalability of Continuous-Time Bayesian Inference in Analogue CMOS Circuits 1576**
Przemyslaw Mrosczyk, Piotr Dudek
University of Manchester, United Kingdom
- B4P-V03** **Characterization of Processing Errors on Analog Fully-Programmable Cellular Sensor-Processor Arrays..... 1580**
Stephen Carey², Akos Zarányi¹, Piotr Dudek²
¹*Pázmány Péter Catholic University, Hungary*; ²*University of Manchester, United Kingdom*
- B4P-V04** **CheckerBoard Binary CNN Core 1584**
Ari Paasio
University of Turku, Finland
- B4P-V05** **A Delay Circuit with 4-Terminal Magnetic-Random-Access-Memory Device for Power-Efficient Time-Domain Signal Processing..... 1588**
Ryusuke Nebashi¹, Noboru Sakimura¹, Hiroaki Honjo¹, Ayuka Morioka¹, Yukihide Tsuji¹, Kunihiko Ishihara¹, Keiichi Tokutome¹, Sadahiko Miura¹, Shunsuke Fukami², Keizo Kinoshita², Takahiro Hanyu², Tetsuo Endoh², Naoki Kasai², Hideo
¹*NEC Corporation, Japan*; ²*Tohoku University, Japan*

B5L-A: SPECIAL SESSION: Efficient Comb-Based Decimation Filters for High-Performance Sigma-Delta Converters

Time: Tuesday, June 3, 2014, 16:30 - 18:00
Room: Plenary1
Chair(s): Gordana Jovanovic Dolecek, *Institute INAOE*
Jose M. de la Rosa, *Universidad de Sevilla*

- B5L-A01** **An Overview of Decimator Structures for Efficient Sigma-Delta Converters: Trends, Design Issues and Practical Solutions..... 1592**
Gerardo Molina Salgado², Gordana Jovanovic Dolecek², Jose M. de la Rosa¹
¹*Instituto de Microelectrónica de Sevilla-CNM / CSIC-Universidad de Sevilla, Spain;*
²*Instituto Nacional de Astrofísica, Óptica y Electrónica, Mexico*
- B5L-A02** **Low-Power Comb Decimation Filter for RF Sigma-Delta ADCs 1596**
Alp Kilic, Delaram Haghighitalab, Habib Mehrez, Hassan Aboushady
Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France
- B5L-A03** **Reduce Energy Requirements by Coupling a Poly-Phase Pre-Filter and CIC Filter in High-Performance Sigma-Delta A/D Converters 1600**
Fred Harris
San Diego State University, United States
- B5L-A04** **Integer-Coefficient FIR Filter Sharpening for Equiripple Stopbands and Maximally Flat Passbands 1604**
Jeffrey Coleman
Naval Research Laboratory, United States

B5L-B: Novel Bio-medical Technology

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 207

Chair(s): Gianluca Setti, *Universita' di Ferrara*
Sandro Carrara, *École Polytechnique Fédérale de Lausanne*

- B5L-B01** **A Custom Signal Processor Based Neuroprosthesis Intended to Recover Urinary Bladder Functions 1608**
Arnaldo Mendez, Mohamad Sawan
École Polytechnique de Montréal, Canada
- B5L-B02** **Closed Loop Inverse Load Modulation Power Control by Magnetic Field Diminishment in Inductively Powered Biomedical Implants 1612**
Christian Brendler, Naser Pour Aryan, Viola Rieger, Albrecht Rothermel
Universität Ulm, Germany
- B5L-B03** **On Using Compressed Sensing for Efficient Transmission & Storage of Electric Organ Discharge..... 1616**
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New Mexico State University, United States
- B5L-B04** **Monitoring of Repeated Head Impacts Using Time-Dilation Based Self-Powered Sensing 1620**
Kenji Aono, Tracey Covassin, Shantanu Chakrabartty
Michigan State University, United States

B5L-C: Integrated Power Circuits and Systems

Time: Tuesday, June 3, 2014, 16:30 - 18:00
Room: 208
Chair(s): Eduard Alarcon, *UPC BarcelonaTech*
Ke-Horng Chen, *National Chiao Tung University*

- B5L-C01** **A Compact Stacked-Device Output Driver in Low-Voltage CMOS Technology 1624**
Yoursr Ismail, Chih-Kong Ken Yang
University of California, Los Angeles, United States
- B5L-C02** **Computationally Efficient Clustering of Power Supplies in Heterogeneous Real Time Systems 1628**
Inna Vaisband, Eby Friedman
University of Rochester, United States
- B5L-C03** **A Multi-Output on-Chip Switched-Capacitor DC-DC Converter for Near- and Sub-Threshold Power Modes 1632**
Yingbo Zhao², Yintang Yang², Kaushik Mazumdar¹, Xinfei Guo¹, Mircea R. Stan¹
¹*University of Virginia, United States;* ²*Xidian University, China*
- B5L-C04** **An Efficient RF Power Harvester for Low Input Power with Reduced Dead-Zone 1636**
Hugo Gonçalves, Jorge Fernandes, Taimur Rabuske, Miguel Martins
INESC-ID, Portugal
- B5L-C05** **A 60-GHz Energy Harvesting Module with on-Chip Antenna and Switch for Co-Integration with ULP Radios in 65-nm CMOS with Fully Wireless mm-Wave Power Transfer Measurement..... 1640**
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Eindhoven University of Technology, Netherlands

B5L-D: Nano-Electronics II

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 209

Chair(s): Sorin Cotofana, *TU Delft*
Robert Chang, *National Chung Hsing University*

- B5L-D01** **Graphene Nanoelectronic Circuit Architecture Based on Binary Decision DiagramB#5**
Sansiri Tanachutiwat², Ji Ung Lee³, Wei Wang¹
¹*Chinese Academic of Science, China*; ²*King Mongkut's University of Technology North Bangkok, Thailand*; ³*SUNY College of Nanoscale Science and Engineering, United States*
- B5L-D02** **Highly Scalable Neuromorphic Hardware with 1-Bit Stochastic Nano-Synapses 1648**
Omid Kavehei, Efstratiosn Stan Skafidas
University of Melbourne, Australia
- B5L-D03** **Implementation of the Conscience Mechanism Using Single-Electron Transfer in Competitive Learning 1652**
Ran Xiao, Chunhong Chen
University of Windsor, Canada
- B5L-D04** **Variability Analysis of a Hybrid CMOS/RS Nanoelectronic Calibration Circuit 1656**
Arne Heitmann, Tobias Noll
Rheinisch-Westfälische Technische Hochschule Aachen, Germany
- B5L-D05** **TSPC Flip-Flop Circuit Design with Three-Independent-Gate Silicon Nanowire FETs 1660**
Xifan Tang, Jian Zhang, Pierre-Emmanuel Gaillardon, Giovanni De Micheli
École Polytechnique Fédérale de Lausanne, Switzerland

B5L-E: Analog Design Techniques

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 210

Chair(s): Brian Ma, *University of Texas, Dallas*
Jaime Ramirez-Angulo, *New Mexico State University*

- B5L-E01** **A Staircase Conductance Modulation Scheme for Input-Current-Shaping in Switched-Capacitor DC-DC Converters 1664**
Sally Safwat², Rinkle Jain¹, Dawson Kesling¹
¹Intel Corporation, United States; ²Mixel, Inc, United States
- B5L-E02** **A 2+1 Multi-Bit Incremental Architecture Using Smart-DEM Algorithm..... 1668**
Yao Liu, Edoardo Bonizzoni, Franco Maloberti
Università degli Studi di Pavia, Italy
- B5L-E03** **A Top-Down Optimization Methodology for SC Filter Circuit Design 1672**
Hugo Serra², Rui Santos-Tavares¹, Nuno Paulino¹
¹UNINOVA, Portugal; ²Universidade Nova de Lisboa / UNINOVA, Portugal
- B5L-E04** **Using the Sensitivity Analysis of the Noise Spectral Density and the Sensitivity Analysis of the Noise Figure for Practical Circuit Design 1676**
Josef Dobes¹, Jan Divin², Jiri Svaton¹, Frantisek Vejrazka¹
¹Czech Technical University in Prague, Czech Rep.; ²ON Semiconductor, SCG Czech Design Center, Czech Rep.
- B5L-E05** **Hexagonal Multi-Beam Analog RF Aperture Array..... 1680**
Chamith Wijenayake¹, Arjuna Madanayake¹, Len Bruton²
¹University of Akron, United States; ²University of Calgary, Canada

B5L-F: MIMO System

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 211

Chair(s): Wei Xing Zheng, *University of Western Sydney*

- B5L-F01 High Performance MIMO Detector Based on Bidirectional Path Preserving Trellis Search 1684**
Jienan Chen¹, Lian Huai², Jianhao Hu¹, Gerald Sobelman²
¹*University of Electronic Science and Technology of China, China;* ²*University of Minnesota, United States*
- B5L-F02 Low Power Reduced-Complexity Error-Resilient MIMO Detector 1688**
Chung-An Shen¹, Muhammad Khairy², Ahmed M Eltawil³, Fadi J Kurdahi³
¹*National Taiwan University of Science and Technology, Taiwan;* ²*Qualcomm Incorporated, United States;* ³*University of California, Irvine, United States*
- B5L-F03 A Low-Complexity Composite QR Decomposition Architecture for MIMO Detector 1692**
Ji-Hwan Yoon, Dongyeob Shin, Jongsun Park
Korea University, Korea, South
- B5L-F04 A 4 x 4 Multiplier-Divider-Less K-Best MIMO Decoder Up to 2.7 Gbps 1696**
Thi Hong Tran¹, Hiroshi Ochi¹, Yuhei Nagao²
¹*Kyushu Institute of Technology, Japan;* ²*Radrix Co. Ltd., Japan*
- B5L-F05 Hardware Efficient Approximative Matrix Inversion for Linear Pre-Coding in Massive MIMO 1700**
Hemanth Prabhu, Ove Edfors, Joachim Neves Rodrigues, Liang Liu, Fredrik Rusek
Lund University, Sweden

B5L-G: DSP for Communication

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 212

Chair(s): Yoshikazu Miyanaga, *Hokkaido University*
Wei-Ping Zhu, *Concordia University*

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	Yanjie Peng, Xinming Huang <i>Worcester Polytechnic Institute, United States</i>	
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B5L-H: Low-Power Logic & Architectures

Time: Tuesday, June 3, 2014, 16:30 - 18:00

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Chair(s): Vasily Moshnyaga, *Fukuoka University*
Shuenn-Yuh Lee, *National Cheng Kung University*

- B5L-H01** **An Energy-Efficient Parallel-Processing Method Based on Master-Hibernating DVFS** 1724
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Hitachi Ltd., Japan
- B5L-H02** **Extensional Design for Noise-Tolerate MRF Standard Cells via Global Mapping**..... 1728
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University of Electronic Science and Technology of China, China
- B5L-H03** **An Architecture for Low-Power Compressed Sensing and Estimation in Wireless Sensor Nodes** 1732
David Bellasi¹, Riccardo Rovatti³, Luca Benini¹, Gianluca Setti²
¹*Eidgenössische Technische Hochschule Zürich, Switzerland*; ²*Università degli Studi di Ferrara, Italy*; ³*Università di Bologna, Italy*
- B5L-H04** **Quantitative Comparison of the Power Reduction Techniques for Samsung Reconfigurable Processor** 1736
Hoyoung Kim¹, Soojung Ryu¹, Abhishek Sinkar², Namsung Kim²
¹*Samsung Electronics Co., Ltd., Korea, South*; ²*University of Wisconsin, Madison, United States*
- B5L-H05** **Critical-Path Aware Power Consumption Optimization Methodology (CAPCOM) Using Mixed-VTH Cells for Low-Power SOC Designs** 1740
Gregory Lin, Chienbo Hsu, James Kuo
National Taiwan University, Taiwan

B5L-J: Testing & Other Areas in VLSI

Chair(s): Mladen Berekovic, *Technische Universität Carolo-Wilhelmina zu Braunschweig*
Izzet Kale, *University of Westminster*

- B5L-J01** **Asynchronous Test Hardware for Null Convention Logic 1744**
Nastaran Nemati, Mark C. Reed, Michael R. Frater
Australian Defence Force Academy, University of New South Wales, Australia
- B5L-J02** **A New Algorithm for Single Residue Digit Error Correction in Redundant
Residue Number System 1748**
Thian Fatt Tay, Chip-Hong Chang
Nanyang Technological University, Singapore
- B5L-J03** **An Efficient High-Throughput VLSI Architecture for a Synchronization Block
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Reza Ghanaatian, Mahdi Shabany, Mohammad Sharifkhani
Sharif University of Technology, Iran
- B5L-J04** **Unambiguous I-Cache Testing Using Software-Based Self-Testing Methodology 1756**
Ching-Wen Lin, Chung-Ho Chen
National Cheng Kung University, Taiwan
- B5L-J05** **Packet Logging Mechanism for Adaptive Online Fault Detection on Network-on-
Chip 1760**
Ling Kim Loo², Chia Yee Ooi², Vui Yong Liew¹, Yuan Wen Hau², Muhammad
Nadzir Marsono²
¹*Intel Malaysia, Malaysia;* ²*Universiti Teknologi Malaysia, Malaysia*

B5L-K: Oscillators and Phase-locked Loops

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 219

Chair(s): Yoshifumi Nishio, *Tokushima University*

Yoko Uwate, *University of Tokushima*

- B5L-K01** **A Clockless, Multi-Stable, CMOS Analog Circuit..... 1764**
Mohammad Alhawari¹, Michael H. Perrott²
¹Khalifa university, U.A.E.; ²Silicon Laboratories, United States
- B5L-K02** **A Novel Injection Locked Rotary Traveling Wave Oscillator 1768**
Zhanjun Bai, Xing Zhou, Ralph Mason
Carleton University, Canada
- B5L-K03** **Design of a Frequency Reference Based on a PVT-Independent Transmission
Line Delay 1772**
Florian De Roose, Valentijn De Smedt, Wouter Volkaerts, Michiel Steyaert,
Georges Gielen, Patrick Reynaert, Wim Dehaene
Katholieke Universiteit Leuven, Belgium
- B5L-K04** **Design of a Wideband Low Power FMCW Synthesizer in 65 nm CMOS for Radar
Applications..... 1776**
Supeng Liu, Yuanjin Zheng, Xiaofeng He
Nanyang Technological University, Singapore
- B5L-K05** **N-Phase Synchronization of Asymmetric Attractors in a Ring of Coupled Chaotic
Circuits..... 1780**
Takuya Nishimoto³, Yoko Uwate³, Yasuteru Hosokawa², Yoshifumi Nishio³,
Dani le Fournier-Prunaret¹
*¹Institut National des Sciences Appliqu es de Toulouse, France; ²Shikoku University,
Japan; ³Tokushima University, Japan*

B5L-L: SPECIAL SESSION: Analysis, Synchronization & Control of Complex Networks: Theory & Applications

Time: Tuesday, June 3, 2014, 16:30 - 18:00

Room: 220

Chair(s): Mario di Bernardo, *University of Bristol*
Guanrong Chen, *City University of Hong Kong*

- B5L-L01** **Towards a Graphic Tool of Structural Controllability of Temporal Networks 1784**
Yujian Pan, Xiang Li
Fudan University, China
- B5L-L02** **Dynamical Networks with on-Off Stochastic Connections: Beyond Fast Switching 1788**
Russell Jeter, Igor Belykh
Georgia State University, United States
- B5L-L03** **Observer Design for Consensus of General Fractional-Order Multi-Agent Systems 1792**
Yang Li², Wenwu Yu², Guanghui Wen², Xinghuo Yu¹, Lingling Yao²
¹*RMIT University, Australia*; ²*Southeast University, China*
- B5L-L04** **Consensus and Synchronization of Complex Networks via Proportional-Integral Coupling 1796**
Daniel Alberto Burbano, Mario Di Bernardo
Università degli Studi di Napoli Federico II, Italy

C1L-M: **CAS-FEST Special Session on Atomic Scale Processes for Memristive & Neuromorphic Operations**

Time: Wednesday, June 4, 2014, 08:00 - 09:00

Room: 204

Chair(s): Ilia Valov, *FZ Jülich & RWTH Aachen*

 Doo Seok Jeong, *Korea Institute of Science and Technology*

C1L-M01 **Real-Time Identification of the Evolution of Conducting Nano-Filaments in TiO₂ Thin Film ReRAM****No Paper**

Seul Ji Song¹, Jun Yeong Seok¹, Jung Ho Yoon¹, Byung Joon Choi², Cheol Seong Hwang¹

¹*Seoul National University, Korea, South;* ²*Seoul National University of Science and Technology / Hewlett-Packard Company, Korea, South*

C1L-M02 **Volatile and Nonvolatile Selective Operation of a Two-Terminal Gap-Type Atomic Switch**..... **1800**

Tsuyoshi Hasegawa, Tohru Tsuruoka, Masakazu Aono
National Institute for Materials Science, Japan

C1L-M03 **Towards Nanoionics-Based Artificial Neurons and Synapses: a Materials Point of View**.....**No Paper**

Doo Seok Jeong

Korea Institute of Science and Technology, Korea, South

C2L-A: SPECIAL SESSION: Applications of Advanced Nolinear System Theory to Smart Grids

Time: Wednesday, June 4, 2014, 09:00 - 10:30
Room: Plenary1
Chair(s): Chia-Chi Chu, *National Tsing Hua University*
Luis Alberto, *University of Sao Paulo*

- C2L-A01 Nonlinear Analysis of Multi-Converter Power Systems for Microgrids 1804**
Chika Nwankpa, Juan Jimenez, Sachi Jayasuriya
Drexel University, United States
- C2L-A02 Convergence/Divergence Analysis of Implicit Z-Bus Power Flow for General Distribution Networks 1808**
Hsiao-Dong Chiang¹, Tian-Qi Zhao², Jiao-Jiao Deng², Kaoru Koyanagi³
¹*Cornell University, United States;* ²*Thapar University, China;* ³*Waseda University, Japan*
- C2L-A03 Chordal Relaxation of OPF for Multiphase Radial Networks 1812**
Lingwen Gan, Steven Low
California Institute of Technology, United States
- C2L-A04 Continuation Techniques for Reachability Analysis of Uncertain Power Systems ... 1816**
Maxim Markov², Mehdi Saghafi¹, Ian Hiskens², Harry Dankowicz¹
¹*University of Illinois, United States;* ²*University of Michigan, United States*
- C2L-A05 Robust Consensus-Based Droop Control for Multiple Power Converters in Isolated Micro-Grids 1820**
Lin-Yu Lu, Chia-Chi Chu
National Tsing Hua University, Taiwan

C2L-B: Novel Medical Diagnostic Method I

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 207

Chair(s): Manuel Delgado-Restituto, *Instituto de Microelectrónica de Sevilla*
Jie Chen, *University of Alberta*

- C2L-B01 Quantitative Estimation of Biological Cell Surface Receptors by Segmenting Conventional Fluorescence Microscopy Images 1824**
Julien Ghaye², Chiara Succa², Danilo Demarchi⁴, Sinan K. Muldur³, Pascal Colpo³, Paolo Silacci¹, Guy Vergères¹, Giovanni De Micheli², Sandro Carrara²
¹*Agroscope Liebefeld-Posieux, Switzerland*; ²*École Polytechnique Fédérale de Lausanne, Switzerland*; ³*Joint Research Centre, Institute for Health and Consumer Protection, Italy*; ⁴*Politecnico di Torino, Italy*
- C2L-B02 A Novel Approach to Perform Reversible Addition/Subtraction Operations Using Deoxyribonucleic Acid 1828**
Ankur Sarker², Hafiz Md Hasan Babu², Md. Saiful Islam¹
¹*Swinburne University of Technology, Austria*; ²*University of Dhaka, Bangladesh*
- C2L-B03 An ISFET Based Analogue Ratiometric Method for DNA Methylation Detection 1832**
Melpomeni Kalofonou, Christofer Toumazou
Imperial College London, United Kingdom
- C2L-B04 Automated Two Stage Detection and Analyzer System in Multipartitioned Digital Microfluidic Biochips 1836**
Pranab Roy¹, Aatreyi Bai¹, Mahua Raha Patra¹, Hafizur Rahaman¹, Parthasarathi Dasgupta²
¹*Bengal Engineering and Science University, Shibpur, India*; ²*Indian Institute of Management Calcutta, India*
- C2L-B05 Energy-Efficient Configurable Discrete Wavelet Transform for Neural Sensing Applications 1841**
Tang-Hsuan Wang², Po-Tsang Huang², Kuan-Neng Chen², Jin-Chern Chiou², Kuo-Hua Chen¹, Chi-Tsung Chiu¹, Ho-Ming Tong¹, Ching-Te Chuang², Wei Hwang²
¹*Advanced Semiconductor Engineering (ASE) Group, Taiwan*; ²*National Chiao Tung University, Taiwan*

C2L-C: Sensors II

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 208

Chair(s): Shih-Chii Liu, *Institute of Neuroinformatics ETHZ-INI*
Jeremy Holleman, *University of Tennessee, Knoxville*

- C2L-C01** **An Area-Efficient on-Chip Temperature Sensor with Nonlinearity Compensation Using Injection-Locked Oscillator (ILO)..... 1845**
Wongyu Shin, Seungwook Paek, Lee-Sup Kim
Korea Advanced Institute of Science and Technology, Korea, South
- C2L-C02** **A 220 x 128 120 mW 60 Frames/s Current Mode Polarization Imager for in Vivo Optical Neural Recording..... 1849**
Timothy York², Viktor Gruev², Debajit Saha¹, Baranidharan Raman¹
¹*Washington University, United States;* ²*Washington University in St. Louis, United States*
- C2L-C03** **FPGA Implementation of the Car Model of the Cochlea 1853**
Chetan Singh Thakur², Tara Julia Hamilton², Jonathan Tapson², André van Schaik², Richard F. Lyon¹
¹*Google, Inc., United States;* ²*University of Western Sydney, Australia*
- C2L-C04** **Octagonal CMOS Image Sensor with Strobed RGB LED Illumination for Wireless Capsule Endoscopy 1857**
Satoshi Yoshizaki¹, Alexantrou Serb², Yan Liu¹, Timothy Constandinou¹
¹*Imperial College London, United Kingdom;* ²*University of Southampton, United Kingdom*
- C2L-C05** **A Low-Light SPAD Vision Array 1861**
Andrew Berkovich, Pamela Abshire
University of Maryland, College Park, United States

C2L-D: Interface Circuits

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 209

Chair(s): Anuj Jain, *Texas Instruments*
Sameer Sonkusale, *Tufts University*

C2L-D01	Energy-Aware Current-Mode Inter-Chip Link for a Dependable GALS NoC Platform.....	1865
	Hirokatsu Shirahama, Akira Mochizuki, Yuma Watanabe, Takahiro Hanyu <i>Tohoku University, Japan</i>	
C2L-D02	A 10-Gb/s 6-Vpp Differential Modulator Driver in 65-nm CMOS	1869
	Yoonsoo Kim, Woorham Bae, Deog-Kyoon Jeong <i>Seoul National University, Korea, South</i>	
C2L-D03	A Low-Power Spread Spectrum Clock Generator with an Embeddable Half-Integer Division Ratio Interpolator	1873
	Hsi-En Liu, Shih-Che Hung, Chih-Wen Lu, Tsin-Yuan Chang <i>National Tsing Hua University, Taiwan</i>	
C2L-D04	Exploiting a Micro Pirani Gauge for Multifonction	1877
	Ming Zhang, Nicolas Llaser, Xusheng Wang, D. Ibrahima <i>Université Paris-Sud, France</i>	

C2L-E: Amplifiers

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 210

Chair(s): Pak Kwong Chan, *Nanyang Technological University*
R. Bogdan Staszewski, *TU Delft*

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- C2L-E01** **A 60-dB Gain OTA Operating at 0.25-V Power Supply in 130-nm Digital CMOS Process** 1881
Luis Ferreira², Sameer Sonkusale¹
¹Tufts University, United States; ²Universidade Federal de Itajubá, Brazil
- C2L-E02** **A 100 Gb/s Transimpedance Amplifier in 65 nm CMOS Technology for Optical Communications** 1885
Maruf Newaz Ahmed, Joseph Chong, Dong Sam Ha
Virginia Polytechnic Institute and State University, United States
- C2L-E03** **Micropower Two-Stage Amplifier Employing Recycling Current-Buffer Miller Compensation**..... 1889
Wei Wang, Zushu Yan, Pui-In Mak, Man-Kay Law, Rui Paulo Martins
Universidade de Macau, China
- C2L-E04** **Sampled-Data Operational-Amplifier with Ultra-Low Supply Voltage and Sub μ W Power Consumption**..... 1893
Pinar Basak Basyurt¹, Devrim Yilmaz Aksin¹, Edoardo Bonizzoni², Franco Maloberti²
¹Istanbul Technical University, Turkey; ²Università degli Studi di Pavia, Italy
- C2L-E05** **Inductor-Less Bandwidth-Extension Technique Applied to CMOS Differential Trans-Impedance Amplifier**..... 1897
Cheng-Ta Chan, Oscar T.-C. Chen
National Chung Cheng University, Taiwan

C2L-F: UWB Communication IC

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 211

Chair(s): Kong Jun Jin, *Samsung*

- C2L-F01** **A High Efficiency Robust IR-UWB Receiver Design for High Data Rate CM-Range Communications** **1901**
Dang Liu, Shuli Geng, Woogeun Rhee, Zihua Wang
Tsinghua University, China
- C2L-F02** **A Non-Coherent IR-UWB Receiver for High Sensitivity Short Distance Estimation ..** **1905**
Marco Crepaldi, Paolo Motto Ros, Alberto Bonanno, Marco Morello, Danilo Demarchi
Istituto Italiano di Tecnologia, Italy
- C2L-F03** **A SAW-Less Dual-Band RF Front-End for IR-UWB Receiver in 65nm CMOS.....** **1909**
Vincenzo Chironi², Stefano D'Amico², Mirko Pasca², Marcello De Matteis¹,
Andrea Baschiroto¹
¹*Università degli Studi di Milano - Bicocca, Italy*; ²*Università del Salento, Italy*
- C2L-F04** **An Efficient Orthogonal Pulse Set Generator for High-Speed Sub-GHz UWB Communications** **1913**
Yang-Guo Li¹, Mohammad Haider¹, Yehia Massoud²
¹*University of Alabama at Birmingham, United States*; ²*Worcester Polytechnic Institute, United States*

C2L-G: High-Efficiency Video Coding

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 212

Chair(s): Oscar Au, *Hong Kong University of Science and Technology*
Tian-Sheuan Chang, *National Chiao Tung University*

- C2L-G01 Photo Album Compression by Leveraging Temporal-Spatial Correlations and HEVC 1917**
Yonggen Ling, Oscar Chi-Lim Au, Ruobing Zou, Jiahao Pang, Haiyan Yang, Amin Zheng
Hong Kong University of Science and Technology, Hong Kong
- C2L-G02 Low Complexity Neighboring Block Based Disparity Vector Derivation in 3D-HEVC 1921**
Jewon Kang, Ying Chen, Li Zhang, Marta Karczewicz
Qualcomm Incorporated, United States
- C2L-G03 Power Efficient and High Troughtput Multi-Size IDCT Targeting UHD HEVC Decoders 1925**
Ruhan Conceição, José Cláudio de Souza Jr., Ricardo Jeske, Marcelo Porto, Bruno Zatt, Luciano Agostini
Universidade Federal de Pelotas, Brazil
- C2L-G04 Gradient-Based PU Size Selection for HEVC Intra Prediction 1929**
Yi-Ching Ting, Tian Sheuan Chang
National Chiao Tung University, Taiwan
- C2L-G05 Rate Distortion Modeling and Adaptive Rate Control Scheme for High Efficiency Video Coding (HEVC) 1933**
Lin Sun⁴, Oscar Chi-Lim Au², Cong Zhao³, Fiona H. Huang¹
¹*ABN Impact, Hong Kong*; ²*Hong Kong University of Science and Technology, Hong Kong*; ³*Lenovo Corporate Research, Hong Kong*; ⁴*Lenovo Corporate Research / Hong Kong University of Science and Technology, Hong Kong*

C2L-H: Memory Circuits and Architectures I

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 213

Chair(s): Chaitali Chakrabarti, *Arizona State University*
Danella Zhao, *University of Louisiana at Lafayette*

- C2L-H01 Rapid Design Space Exploration of Two-Level Unified Caches..... 1937**
Jingyu Deng, Yun Liang, Guojie Luo, Guangyu Sun
Peking University, China
- C2L-H02 Design of SRAM PUF with Improved Uniformity and Reliability Utilizing Device Aging Effect 1941**
Achiranshu Garg, Tony Tae-Hyoung Kim
Nanyang Technological University, Singapore
- C2L-H03 Improving Data Cache Performance Using Persistence Selective Caching..... 1945**
Sumeet S. Kumar, Rene van Leuken
Delft University of Technology, Netherlands
- C2L-H04 High-Voltage Tolerant Circuit Design for Fully CMOS Compatible Multiple-Time Programmable Memories 1949**
Chihyang Huang, Hongchin Lin, Chia-You Wu
National Chung Hsing University, Taiwan
- C2L-H05 High-Performance Low-Power Magnetic Tunnel Junction Based Non-Volatile Flip-Flop 1953**
Taehui Na², Kyungho Ryu², Jisu Kim², Seong-Ook Jung², Jungpill Kim¹, Seung H Kang¹
¹Qualcomm Incorporated, United States; ²Yonsei University, Korea, South

C2L-J: SOC, Multicore & Hardware-Software Codesign I

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 216

Chair(s): Danella Zhao, *University of Louisiana at Lafayette*

Mohsin Jamali, *University of Toledo*

- C2L-J01** **A Spare Router Based Reliable Network-on-Chip Design** **1957**
Navonil Chatterjee, Santanu Chattopadhyay, Kanchan Manna
Indian Institute of Technology Kharagpur, India
- C2L-J02** **Performance and Network Power Evaluation of Tightly Mixed SRAM NUCA for
3D Multi-Core Network on Chips** **1961**
Yuang Zhang¹, Li Li¹, Zhonghai Lu², Axel Jantsch², Yuxiang Fu¹, Minglun Gao¹
¹*Nanjing University, China;* ²*Royal Institute of Technology, Sweden*
- C2L-J03** **A Monitored NoC with Runtime Path Adaptation** **1965**
Edson Moreno, Thais Webber, César Marcon, Fernando Moraes, Ney Calazans
Pontificia Universidade Católica do Rio Grande do Sul, Brazil
- C2L-J04** **A Signal Processor for Gaussian Message Passing** **1969**
Harald Kröll², Stefan Zwicky², Reto Odermatt², Lukas Bruderer², Andreas Burg¹,
Qiuting Huang²
¹*École Polytechnique Fédérale de Lausanne, Switzerland;* ²*Eidgenössische
Technische Hochschule Zürich, Switzerland*
- C2L-J05** **Load Adaptive Multi-Channel Distribution and Arbitration in Unequal RF
Interconnected WiNoC** **1973**
Ruizhe Wu, Danella Zhao
University of Louisiana at Lafayette, United States

C2L-K: Circuits and Systems for Energy Harvesting

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 219

Chair(s): Hirotaka Koizumi, *Tokyo University of Science*
Hiroo Sekiya, *Chiba University*

- C2L-K01 Batteryless Electrostatic Energy Harvester and Control System 1977**
Antonio Carlos M. de Queiroz, Mayli Silva de Souza
Universidade Federal do Rio de Janeiro, Brazil
- C2L-K02 Solar Energy Harvesting with Light Emitting Diodes..... 1981**
Golsa Moayeri Pour, Walter Leon-Salas
Purdue University, United States
- C2L-K03 Chip-on-Mud: Ultra-Low Power Arm-Based Oceanic Sensing System Powered by Small-Scale Benthic Microbial Fuel Cells 1985**
Gyouho Kim², Adriane Wolfe¹, Richard Bell¹, Suyoung Bang², Yoonmyung Lee², Inhee Lee², Yejoong Kim², Lewis Hsu¹, Jeffrey Kagan¹, Meriah Arias-Thode¹, Bart Chadwick¹, Dennis Sylvester², David Blaauw²
¹*Space and Naval Warfare Systems Center, United States;* ²*University of Michigan, United States*
- C2L-K04 Power Management with Energy Harvesting from a Headphone Jack 1989**
Cheng-Han Hsieh², Chung-Yen Du², Shuenn-Yuh Lee¹
¹*National Cheng Kung University, Taiwan;* ²*National Chung Cheng University, Taiwan*
- C2L-K05 A Piezoelectric Energy Harvesting Interface Circuit Using One-Shot Pulse Transformer Boost Converter Based on Water Bucket Fountain Strategy 1993**
Ying-Khai Teh, Philip K.T. Mok
Hong Kong University of Science and Technology, Hong Kong

C2L-L: SPECIAL SESSION: Complexity in Heterogeneous Systems on Chip: Analysis and Design Techniques

Time: Wednesday, June 4, 2014, 09:00 - 10:30
Room: 220
Chair(s): Dimitri Galayko, *UPMC " Sorbonne Universités*
Elena Blokhina, *University College Dublin*

- C2L-L01 Complexity in Heterogeneous Systems on Chips: Design and Analysis Challenges 1997**
Dimitri Galayko³, Elena Blokhina⁷, Eldar Zianbetov³, Andrii Dudka⁴, François Anceau³, Eric Colinet¹, Anton Korniienko², Jérôme Juillard⁵, Philippe Basset⁶
¹*Apix Technology, France*; ²*École Centrale de Lyon, France*; ³*Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France*; ⁴*Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie / L'Université de Bordeaux, Fra*
- C2L-L02 The Design of Low Complexity Low Power Pipelined Short Length Winograd Fourier Transforms..... 2001**
Adem Coskun³, Izzet Kale³, Richard Morling³, Robert Hughes¹, Stephen Brown¹, Piero Angeletti²
¹*EADS Astrium Ltd, United Kingdom*; ²*European Space Agency, Netherlands*; ³*University of Westminster, United Kingdom*
- C2L-L03 Effectiveness of Artificial Neural Network with Time-Varying Coupling System 2005**
Yoko Uwate, Yoshifumi Nishio
Tokushima University, Japan
- C2L-L04 System-on-Chip Considerations for CMOS Fluidic and Biointerface Applications ... 2009**
Timir Datta-Chaudhuri, Pamela Abshire, Elisabeth Smela
University of Maryland, College Park, United States
- C2L-L05 Opportunities and Challenges for the Virtual Prototyping of Synthetic Biological Functions 2013**
Morgan Madec¹, François Pecheux², Fabienne Jezequel², Yves Gendrault¹, Christophe Lallement¹, Jacques Haiech³
¹*ICube, France*; ²*Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France*; ³*Université de Strasbourg, France*

C2L-M: CAS-FEST Special Session on Modeling of Resistive/memristive Switching Devices

Time: Wednesday, June 4, 2014, 09:00 - 10:30

Room: 204

Chair(s): Daniele Ielmini, *Politecnico di Milano*
Dalibor Bielek, *Brno University of Technology*

- C2L-M01 Overview of Resistive Switching Memory (RRAM) Switching Mechanism and Device Modeling 2017**
Shimeng Yu
Arizona State University, United States
- C2L-M02 Ab initio Modeling of Resistive Switching Mechanism in Binary Metal Oxides 2021**
Blanka Magyari-Köpe³, Liang Zhao³, Yoshio Nishi³, Katsumasa Kamiya¹, Moon Young Yang⁴, Kenji Shiraishi²
¹*Kanagawa Institute of Technology, Japan*; ²*Nagoya University, Japan*; ³*Stanford University, United States*; ⁴*University of Tsukuba, Japan*
- C2L-M03 Modeling and Simulation of Electrochemical Metallization Memory Cells 2025**
Stephan Menzel
Forschungszentrum Jülich GmbH, Germany
- C2L-M04 Statistical Modeling of Program and Read Variability in Resistive Switching Devices 2029**
Stefano Ambrogio, Simone Balatti, Antonio Cubeta, Daniele Ielmini
Politecnico di Milano, Italy
- C2L-M05 Qualitative SPICE Modeling Accounting for Volatile Dynamics of TiO2 Memristors 2033**
Radu Berdan¹, Ali Khat², Christos Papavassiliou¹, Themistoklis Prodromakis²
¹*Imperial College London, United Kingdom*; ²*University of Southampton, United Kingdom*

C3L-A: SPECIAL SESSION: Circuitual Aspects of Emergent Application Driven Wireless Power Transfer Systems

Time: Wednesday, June 4, 2014, 11:00 - 12:30
Room: Plenary1
Chair(s): Eduard Alarcon, *UPC BarcelonaTech*
Patrick Hu, *University of Auckland*

- C3L-A01** **Advances in Non-Radiative Resonant Inductive Coupling Wireless Power Transfer: a Comparison of Alternative Circuit and System Models Driven by Emergent Applications..... 2037**
Elisenda Bou-Balust¹, Raymond Sedwick³, Patrick Hu², Eduard Alarcón¹
¹*Universitat Politècnica de Catalunya, Spain;* ²*University of Auckland, New Zealand;*
³*University of Maryland, College Park, United States*
- C3L-A02** **An Experimental Technique for Design of Practical Wireless Power Transfer Systems..... 2041**
Vamsi Talla, Joshua Smith
University of Washington, United States
- C3L-A03** **Optimal Coil Size Ratios for Wireless Power Transfer Applications..... 2045**
Benjamin Waters², Brody Mahoney², Gunbok Lee¹, Joshua Smith²
¹*Pohang University of Science and Technology, Korea, South;* ²*University of Washington, United States*
- C3L-A04** **Efficiency Enhancement Techniques and a Dual-Band Approach in RF Rectifiers for Wireless Power Harvesting 2049**
Pouya Kamalinejad, Kamyar Keikhosravy, Reza Molavi, Shahriar Mirabbasi, Victor C. M. Leung
University of British Columbia, Canada

C3L-B: **Novel Medical Diagnostic Method II**
Time: Wednesday, June 4, 2014, 11:00 - 12:30
Room: 207
Chair(s): Timothy Constandinou, *Imperial College London*
 Viktor Owall, *Lund University*

- C3L-B01** **A Multimodal Investigation of in Vivo Muscle Behavior: System Design and Data Analysis..... 2053**
Xin Chen¹, Sheng Zhong¹, Yangyang Niu¹, Siping Chen¹, Tianfu Wang¹, Shing-Chow Chan², Zhiguo Zhang²
¹*Shenzhen University, China*; ²*University of Hong Kong, China*
- C3L-B02** **Efficient Learning Based Face Hallucination Approach via Facial Standard Deviation Prior 2057**
Liang Chen, Ruimin Hu, Junjun Jiang, Zhen Han
Wuhan University, China
- C3L-B03** **A Low-Complexity Intestinal Lumen Detection Method for Wireless Endoscopy Images 2061**
Jianlong Zhang, Dan Wang, Xiang Xie, Guolin Li, Yingke Gu, Zhihua Wang
Tsinghua University, China
- C3L-B04** **Eye-Gesture Controlled Intelligent Wheelchair Using Electro-Oculography..... 2065**
Theja Ram Pingali, Sarthak Dubey, Anurag Shivaprasad, Arpit Varshney, Satish Ravishankar, Govinda Ram Pingali, Niyanth Krishna Polisetty, Nikhil Manjunath, Padmaja K V
Rashtreeya Vidyalyaya College of Engineering, India
- C3L-B05** **A Wirelessly Monitoring System Design for Total Hip Replacement Surgery..... 2069**
Hong Chen², Shaojie Su², Zhihua Wang², Xu Zhang¹
¹*Institute of Semiconductors, China*; ²*Tsinghua University, China*

C3L-C: Neomorphic Circuits & Systems

Time: Wednesday, June 4, 2014, 11:00 - 12:30

Room: 208

Chair(s): Shih-Chii Liu, *Institute of Neuroinformatics ETHZ-INI*
Alejandro Linares-Barranco, *University of Seville*

- C3L-C01 Ultra Low Leakage Synaptic Scaling Circuits for Implementing Homeostatic Plasticity in Neuromorphic Architectures..... 2073**
Giovanni Rovere², Qiao Ning¹, Chiara Bartolozzi², Giacomo Indiveri¹
¹*Eidgenössische Technische Hochschule Zürich / Universität Zürich, Switzerland;*
²*Istituto Italiano di Tecnologia, Italy*
- C3L-C02 The Synaptic Kernel Adaptation Network..... 2077**
Richard Sofatzis¹, Saeed Afshar², Tara Julia Hamilton²
¹*University of New South Wales, Australia;* ²*University of Western Sydney, Australia*
- C3L-C03 Realization of Processing Blocks of CNN Based Casa System on CPU and FPGA .. 2081**
Osman Levent Savkay², Evren Cesur³, Nerhun Yildiz³, Mustak Erhan Yalçin²,
Vedat Tavsanoglu¹
¹*Isik University, Turkey;* ²*Istanbul Technical University, Turkey;* ³*Yildiz Technical University, Turkey*
- C3L-C04 Memristors as Synapse Emulators in the Context of Event-Based Computation..... 2085**
Alexantrou Serb³, Radu Berdan¹, Ali Khat³, Shari Li¹, Eleni Vasilaki², Christos Papavassiliou¹, Themistoklis Prodromakis³
¹*Imperial College London, United Kingdom;* ²*University of Sheffield, United Kingdom;*
³*University of Southampton, United Kingdom*

C3L-D: Analog Filters

Time: Wednesday, June 4, 2014, 11:00 - 12:30

Room: 209

Chair(s): Joseph Chang, *Nanyang Technological University*
Shanthi Pavan, *Indian Institute of Technology*

- C3L-D01 Design and Optimization of Continuous-Time Filters Using Geometric Programming 2089**
Siddharth Seth¹, Boris Murmann²
¹*Samsung Research America, United States*; ²*Stanford University, United States*
- C3L-D02 A Reconfigurable FGMOS Based OTA-C Filter..... 2093**
John Richard Hizon², Esther Rodriguez-Villegas¹
¹*Imperial College London, United Kingdom*; ²*University of the Philippines Diliman, Philippines*
- C3L-D03 Stability Analysis and Design Methodology for an Akerberg-Mossberg Filter 2097**
Gerald Hilber¹, Alexander Burgstaller¹, Holley Stitz¹, Andreas Rauchenecker¹,
Timm Ostermann¹, Janos Gila², Martin Schiefer²
¹*Johannes Kepler Universität Linz, Austria*; ²*Siemens AG Austria, Austria*
- C3L-D04 Low-Power Fine-Tuning Switched-Resistor Reconfigurable Filter 2101**
Amorn Jiraseree-Amornkun¹, Wanlop Surakamponorn²
¹*Mahanakorn University of Technology, Thailand*; ²*Thailand Advanced Institute of Science and Technology, Thailand*
- C3L-D05 Bessel-Butterworth Transitional Filters 2105**
Igor Filanovsky
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¹*Broadcom Corporation, Australia;* ²*NHEW R&D Pty Ltd, Australia;* ³*University of New South Wales, Australia*
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¹*General Electric Aviation, United Kingdom;* ²*General Electric Deutschland Holding GMBH, Germany*
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¹Himax Technologies, Inc., Taiwan; ²National Cheng Kung University, Taiwan
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¹Intel Corporation, United States; ²Stanford University, United States

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¹*Beijing Institute of Technology, China*; ²*Nanyang Technological University, Singapore*; ³*University of Science and Technology Beijing, China*
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¹*Politecnico di Torino, Italy*; ²*Technische Universität Dresden, Germany*; ³*Université du Havre, France*

C4L-M: CAS-FEST Special Session on Analog Memristor Circuits

Time: Wednesday, June 4, 2014, 14:00 - 15:00

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Chair(s): Mika Laiho, *University of Turku*

Eero Lehtonen, *University of Turku*

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Mika Laiho³, Eero Lehtonen³, Jennifer Hasler¹, Jiantao Zhou², Chao Du², Wei Lu², Jussi Poikonen³

¹*Georgia Institute of Technology, United States*; ²*University of Michigan, United States*; ³*University of Turku, Finland*

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Reut Wizenberg¹, Ali Khat², Radu Berdan¹, Christos Papavassiliou¹, Themistoklis Prodromakis²

¹*Imperial College London, United Kingdom*; ²*University of Southampton, United Kingdom*

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Farnood Merrikh-Bayat², Fabien Alibart¹, Ligang Gao², Dmitri Strukov²

¹*Université Lille 1 / French National Centre for Scientific Research, France*;

²*University of California, Santa Barbara, United States*

C5P-N: Image Processing and Compression

Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Moncef Gabbouj, *Tampere University of Technology*
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¹Hong Kong University of Science and Technology, Hong Kong; ²International Institute of Information Technology, Hyderabad, India

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Time: Wednesday, June 4, 2014, 15:00 - 16:30

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He Tang, *University of Electronic Science and Technology of China*

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¹*Fairchild Semiconductor, United States*; ²*OmniVision Technologies, United States*;
³*RF Micro Devices, United States*; ⁴*Tsinghua University, China*; ⁵*University of
California, Riverside, United States*; ⁶*University of Electronic Science and Technol*

C5P-R: Data Convertors IV

Time: Wednesday, June 4, 2014, 15:00 - 16:30
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- C5P-R04** **Time Amplifiers Based on Phase Accumulation** **2349**
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Chair(s): Deukhyoun Heo, *Washington State University*
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- C5P-S04** **A High-Speed Low-Power Calibrated Flash ADC 2369**
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C5P-T: Circuits for Bio-sensing

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Room: Main Foyer

Chair(s): George Yuan, *Hong Kong University of Science and Technology*

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¹*ENSEIRB, France;* ²*University of Westminster, United Kingdom*
- C5P-U05** **Detrended Fluctuation Analysis of Brain Hemisphere Magnetic Resonance Images to Detect Cerebral Arteriovenous Malformations**..... 2409
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¹*Université du Québec à Montréal, Canada;* ²*University of Toronto, Canada*

C5P-V: Education in Circuits & Systems

Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Babak Ayazifar, *University of California, Berkeley*
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- C5P-V01 Teaching Introductory Circuits and Systems: Enhancing Learning Experience via Iterative Design Process and Pre-/Post-Project Learning Activities..... 2413**
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C6P-N: Power Converters and Wireless Power Transfer

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Room: Main Foyer

Chair(s): Eduard Alarcon, *UPC BarcelonaTech*
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¹*Chiba University, Japan*; ²*New York University Polytechnic School of Engineering, United States*; ³*Wright State University, United States*; ⁴*Wuhan University, China*

C6P-P: Power Management, Modelling and Control

Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Wing-Hung Ki, *The Hong Kong University of Science and Technology*
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¹*Georgia Institute of Technology, United States;* ²*Texas Instruments Inc., United States*
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¹*Hong Kong University of Science and Technology, Hong Kong;* ²*Qualcomm Incorporated, United States*

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Time: Wednesday, June 4, 2014, 15:00 - 16:30

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Chair(s): Wei Xing Zheng, *University of Western Sydney*

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- C6P-Q04** **Shift Register Multi-Phase Clock Based Downsampled Floating Tap DFE for
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- C6P-Q05** **An Inductorless Linear Optical Receiver for 20Gbaud/s (40Gb/s) PAM-4
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- C6P-Q06** **The Diffserv Cognitive Network Node with Controlled-UDP..... 2477**
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Room: Main Foyer

Chair(s): Hassan Aboushady, LIP6

- C6P-R01 A 95 dB Dynamic Range Automatic Gain Control Circuits and Systems for Multi-Standard Digital TV Tuner..... 2482**
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¹*Institute of Microelectronics of Chinese Academy of Sciences, China;* ²*Nanyang Technological University, Singapore*
- C6P-R02 Circuit Area Optimization in Energy Temporal Sparse Scenarios for Multiple Harvester Powered Systems..... 2486**
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- C6P-R03 Reconfigurable CORDIC Architectures for Multi-Mode and Multi-Trajectory Operations 2490**
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¹*Nanyang Technological University, Singapore;* ²*National Institute of Technology, Delhi, India*
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- C6P-R05 Directional Cyclostationary Feature Detectors Using 2-D IIR RF Spiral-Antenna Beam Digital Filters 2499**
Arjuna Madanayake¹, Nilan Udayanga¹, Chamith Wijenayake¹, Mohammad Almalkawi², Vijay Devabhaktuni²
¹*University of Akron, United States;* ²*University of Toledo, United States*
- C6P-R06 A Wirelessly-Powered UWB Sensor Tag with Time-Domain Sensor Interface..... 2503**
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¹*Fudan University, China;* ²*Royal Institute of Technology, Sweden*

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Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Jun Jin Kong, *Samsung Electronics Co*
Zhiyuan Yan, *Lehigh University*

- C6P-S02 An FPGA-Based Architecture for Kernel-Smoothed Local Histogram Computation B#5**
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¹*Birla Institute of Science and Technology, India*; ²*Central Electronics Engineering Research Institute, India*
- C6P-S03 Area and Throughput Efficient IDCT/IDST Architecture for HEVC Standard..... 2511**
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- C6P-S04 FPGA Implementation of Feature Extraction for Colorectal Endoscopic Images with NBI Magnification 2515**
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- C6P-S05 Accurate and Efficient Modeling of Random Demodulation Based Compressive Sensing Systems with a General Filter 2519**
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C6P-T: SOC, Multicore & Hardware-Software Codesign III

Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Pramod Kumar Meher, *Nanyang Technological University*
Tae Hyoung Kim, *Nanyang Technological University*

- C6P-T01** **A Hybrid Memory Address Mapping Schema to Balance Power and Performance... B#5**
Zongwei Zhu, Xi Li, Feng Yang, Beilei Sun, Jiefeng Wang, Xuehai Zhou
University of Science and Technology of China, China
- C6P-T02** **A 65 nm Uneven-Dual-Core SoC Based Platform for Multi-Device Collaborative Computing 2527**
Wenping Zhu², Leibo Liu², Shouyi Yin², Yuan Dong², Shaojun Wei², Eugene Y Tang¹, Jiqiang Song¹, Jinzhan Peng¹
¹*Intel Labs, China*; ²*Tsinghua University, China*
- C6P-T03** **Tool-Set for NoC-Based MPSoC Debugging - a Protocol View Perspective 2531**
Marcelo Ruaro¹, Everton Carara², Fernando Moraes¹
¹*Pontificia Universidade Católica do Rio Grande do Sul, Brazil*; ²*Universidade Federal de Santa Maria, Brazil*
- C6P-T04** **Compact Hardware Oriented Number Recognition Algorithm for Real-Time Speed Traffic-Sign Recognition..... 2535**
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- C6P-T05** **Signal Reconstruction Processor Design for Compressive Sensing 2539**
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Texas A&M University, United States

C6P-U: ASIC, Other VLSI Circuits and Testing

Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Mladen Berekovic, *Technische Universität Carolo-Wilhelmina zu Braunschweig*
Kwen Siong Chong, *Nanyang Technological University*

- C6P-U01** **An Ultra-Low Voltage Hearing Aid Chip Using Variable-Latency Design Technique 2543**
Kuo-Chiang Chang², Shien-Chun Luo¹, Ching-Ji Huang¹, Chih-Wei Liu², Yuan-Hua Chu¹, Shyh-Jye Jou²
¹*Information & Communications Research Laboratories, Industrial Technology Research Institute, Taiwan;* ²*National Chiao Tung University, Taiwan*
- C6P-U02** **Side-Channel Attack Resistant AES Cryptographic Circuits with ROM Reducing Address-Dependent EM Leaks 2547**
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¹*Ristumeikan University, Japan;* ²*Ritsumeikan University, Japan*
- C6P-U03** **Reconfigurable DSP Block Design for Dynamically Reconfigurable Architecture 2551**
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¹*Hong Kong University of Science and Technology, Hong Kong;* ²*Nanyang Technological University, Singapore*
- C6P-U04** **Fast and Accurate Statistical Static Timing Analysis 2555**
Syng-Jyan Wang¹, Tsung-Huei Tzeng¹, Katherine Shu-Min Li²
¹*National Chung Hsing University, Taiwan;* ²*National Sun Yat-Sen University, Taiwan*
- C6P-U05** **Design and Validation of a Novel Reconfigurable and Defect Tolerant JTAG Scan Chain 2559**
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¹* cole Polytechnique de Montr al, Canada;* ²*Universit  du Qu bec   Montr al, Canada*

C6P-V: Algorithms for Sensory Systems

Time: Wednesday, June 4, 2014, 15:00 - 16:30

Room: Main Foyer

Chair(s): Piotr Dudek, *University of Manchester*

Teresa Serrano-Gotarredona, *Instituto de Microelectrónica de Sevilla*

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	Jose Luis Alarcon-Herrera, Xiang Chen <i>University of Windsor, Canada</i>	
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C7L-M: CAS-FEST Special Session on Computing with Memristors

Time: Wednesday, June 4, 2014, 15:20 - 16:20

Room: 204

Chair(s): Robert Legenstein, *TU-Graz*
Giacomo Indiveri, *University of Zurich*

- C7L-M01 Memristive Systems for Analog Signal Processing 2588**
Dalibor Biolek², Viera Biolkova¹, Zdenek Kolka¹
¹*Brno University of Technology, Czech Rep.*; ²*University of Defence/Brno University of Technology, Czech Rep.*
- C7L-M02 Memristive Devices for Stochastic Computing 2592**
Siddharth Gaba, Phil Knag, Zhengya Zhang, Wei Lu
University of Michigan, United States
- C7L-M03 Memristive Nano-Crossbar Arrays Enabling Novel Computing Paradigms 2596**
Eike Linn
Rheinisch-Westfälische Technische Hochschule Aachen, Germany

C8L-A: SPECIAL SESSION: Nonlinearities in Energy Harvesting Systems: Analysis & Applications

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: Plenary1

Chair(s): Abdelali El Aroudi, *Universitat Rovira i Virgili*
Elena Blokhina, *University College Dublin*

- C8L-A01 Smart Integrated Conditioning Electronics for Electrostatic Vibration Energy Harvesters..... 2600**
Andrii Dudka², Dimitri Galayko¹, Elena Blokhina⁴, Philippe Basset³
¹Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France;
²Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie / L'Université de Bordeaux, France; ³Université Paris-Est / ESIEE Paris, France; ⁴Universi
- C8L-A02 Nonlinearities in Electrostatic Vibration Energy Harvesters: a Review Using the Example of a Charge Pump Conditioning Circuit..... 2604**
Elena Blokhina², Eoghan O'Riordan², Orla Feely², Dimitri Galayko¹
¹Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France; ²University College Dublin, Ireland
- C8L-A03 Harmonic-Balance Analysis of Nonlinear Energy Harvester Models..... 2608**
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- C8L-A04 Unveiling Nonlinear Dynamics in Resonant Inductively Coupled Wireless Power Transfer 2612**
Elisenda Bou-Balust², Abdelali El Aroudi³, Peter Fisher¹, Eduard Alarcón²
¹Massachusetts Institute of Technology, United States; ²Universitat Politècnica de Catalunya, Spain; ³Universitat Rovira i Virgili, Spain

C8L-B: Circuits and Systems for Video Technology

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 207

Chair(s): Chih-Peng Fan, *National Chung Hsing University*
Chih-Wei Liu, *National Chiao Tung University*

- C8L-B01** **A High Throughput CAVLC Architecture Design with Two-Path Parallel Coefficients Procedure for Digital Cinema 4K Resolution H.264/AVC Encoding..... 2616**
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National Chung Hsing University, Taiwan
- C8L-B02** **High Throughput VLSI Architecture for HEVC SAO Encoding for Ultra HDTV..... 2620**
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Universidade Federal de Pelotas, Brazil
- C8L-B04** **Area-Delay Efficient Architecture for MP Algorithm Using Reconfigurable Inner-Product Circuits..... 2628**
Pramod Kumar Meher², Basant Mohanty¹, Thambipillai Srikanthan²
¹*Jaypee University of Engineering and Technology, India;* ²*Nanyang Technological University, Singapore*

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Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 208

Chair(s): Shoushun Chen, *Nanyang Technological University*

Teresa Serrano-Gotarredona, *Instituto de Microelectrónica de Sevilla*

- C8L-C01 Comparison of Spike Encoding Schemes in Asynchronous Vision Sensors: Modeling and Design..... 2632**
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Eidgenössische Technische Hochschule Zürich / Universität Zürich, Switzerland
- C8L-C02 Integration of Dynamic Vision Sensor with Inertial Measurement Unit for Electronically Stabilized Event-Based Vision..... 2636**
Tobi Delbruck¹, Vicente Villanueva², Luca Longinotti²
¹*Eidgenössische Technische Hochschule Zürich / Universität Zürich, Switzerland;*
²*inilabs GmbH, Switzerland*
- C8L-C03 Improved Margin Multi-Class Classification Using Dendritic Neurons with Morphological Learning 2640**
Shaista Hussain², Shih-Chii Liu¹, Arindam Basu²
¹*Eidgenössische Technische Hochschule Zürich / Universität Zürich, Switzerland;*
²*Nanyang Technological University, Singapore*
- C8L-C04 Accelerated Frame-Free Time-Encoded Multi-Step Imaging 2644**
Garrick Orchard², Daniel Matolin¹, Xavier Lagorce³, Ryad Benosman³, Christoph Posch³
¹*Pixium Vision S.A., France;* ²*Singapore Institute for Neurotechnology, Singapore;*
³*Université Pierre-et-Marie-Curie, France*
- C8L-C05 Asynchronous, Event-Driven Readout of POSFET Devices for Tactile Sensing 2648**
Stefano Caviglia², Maurizio Valle², Chiara Bartolozzi¹
¹*Istituto Italiano di Tecnologia, Italy;* ²*Università degli Studi di Genova, Italy*

C8L-D: Stability Analysis of Power Systems and Microgrids

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 209

Chair(s): Dylan Lu, *The University of Sydney*
Luis Alberto, *University of Sao Paulo*

- C8L-D01 Determine Groups of Preventive Controls for a Set of Critical Contingencies in Voltage Stability..... 2652**
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Universidade de São Paulo, Brazil
- C8L-D02 A Study of Impact of Wind Power to Power System Stability Using Stochastic Stability Index 2656**
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- C8L-D03 A Two-Time Scale Framework for Stability Analysis of Electrical Power System 2660**
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- C8L-D04 An Active Damping Method for Stabilization of Cascaded Connected Two Stage Converter Systems with Constant Power Loads in DC Microgrids..... 2664**
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- C8L-D05 Stability of Interacting Grid-Connected Power Converters 2668**
Cheng Wan², Meng Huang³, Chi-Kong Michael Tse¹, Xinbo Ruan²
¹*Hong Kong Polytechnic University, Hong Kong*; ²*Huazhong University of Science and Technology, China*; ³*Wuhan University, China*

C8L-E: Analog Signal Processing Circuits II

Time: Wednesday, June 4, 2014, 16:30 - 18:00
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Chair(s): Robert Fox, *University of Florida*
Byunghoo Jung, *Purdue University*

- C8L-E01 A Radio-Controlled Receiver for Clocks/Watches and Alarm Applications 2672**
Jen-Chieh Liu¹, Huan-Ke Chiu¹, Jia-Hung Peng¹, Yuan-Hua Chu¹, Hong-Yi Huang²
¹*Industrial Technology Research Institute, Taiwan*; ²*National Taipei University, Taiwan*
- C8L-E02 A Dual-Level Dual-Phase Pulse-Width Modulation Class-D Amplifier with 0.001% THD, 112 dB SNR 2676**
Shang-Hsien Yang⁴, Yuan-Han Yang⁴, Ke-Horng Chen⁴, Chung-Chih Hung⁴, Chin-Long Wey⁴, Ying-Hsi Lin¹, Tsung-Yen Tsai¹, Chen-Chih Huang¹, Chao-Cheng Lee¹, Zhih Han Tai³, Yi Hsuan Cheng³, Chi Chung Tsai³, Hsin-Yu Luo², Shih-Ming Wang
¹*Chunghwa Picture Tubes, Ltd, Taiwan*; ²*Industrial Technology Research Institute, Taiwan*; ³*Metal Industries Research & Development Centre, Taiwan*; ⁴*National Chiao Tung University, Taiwan*; ⁵*Vanguard International Semiconductor Corp., Taiwan*
- C8L-E03 A Low THD Clock-Free Class-D Audio Amplifier with an Increased Damping Resistor and Cross Offset Cancellation Technique 2680**
Ying-Wei Chou⁴, Meng-Wei Chien⁴, Shin-Chieh Chen⁴, Ke-Horng Chen⁴, Ying-Hsi Lin⁵, Tsung-Yen Tsai⁵, Chen-Chih Huang⁵, Chao-Cheng Lee⁵, Zhih Han Tai¹, Yi Hsuan Cheng¹, Chi Chung Tsai¹, Hsin-Yu Luo³, Shih-Ming Wang², Long-Der Chen²
¹*Chunghwa Picture Tubes, Ltd, Taiwan*; ²*Industrial Technology Research Institute, Taiwan*; ³*Metal Industries Research & Development Centre, Taiwan*; ⁴*National Chiao Tung University, Taiwan*; ⁵*Realtek Semiconductor Corp., Taiwan*; ⁶*Vanguard Internat*
- C8L-E04 PSRR Enhancement Based on QFG Techniques for Low-Voltage Low-Power Design 2684**
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¹*New Mexico State University, United States*; ²*Universidad de Zaragoza, Spain*
- C8L-E05 Modified Current-Mode One-Cycle Control for Linear-Assisted DC/DC Regulator 2688**
Herminio Martínez-García, Jordi Cosp-Vilella
Universitat Politècnica de Catalunya, Spain

C8L-F: Millimeter-wave and Optical Communication Circuits

Time: Wednesday, June 4, 2014, 16:30 - 18:00
Room: 211
Chair(s): Zhiyuan Yan, *Lehigh University*
Shoba Krishnan, *Santa Clara University*

- C8L-F01** **25-Gbps x 4 Optical Transmitter with Adjustable Asymmetric Pre-Emphasis in 65-nm CMOS** 2692
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- C8L-F02** **20.1-mW 8-Gbps UWB-IR Millimeter-Wave Transmitter Using an OOK Pulse Modulator Based on CMOS Inverters**..... 2696
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Nippon Telegraph and Telephone Corporation, Japan
- C8L-F03** **A 2.2GHz-80dB Ohm CMOS Receiver Front-End for Short-Range Optical Communication Employing DMT/OFDM** 2700
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- C8L-F04** **A 65-nm CMOS Burst-Mode CDR Based on a GVCO with Symmetric Loops**..... 2704
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¹*Gifu University, Japan*; ²*Kyoto University, Japan*; ³*Nippon Telegraph and Telephone Corporation, Japan*; ⁴*University of Shiga Prefecture, Japan*
- C8L-F05** **A Scalable Baseband Phase Shifter with 12 GHz I/Q Mixers in 40-nm CMOS for 60 GHz Applications** 2708
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¹*Catena Microelectronics B.V., Netherlands*; ²*Eindhoven University of Technology, Netherlands*

C8L-G: Image and Video Processing

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 212

Chair(s): Oscar Au, *Hong Kong University of Science and Technology*

- C8L-G01 Super-Resolution Reconstruction for Kinect 3D Data 2712**
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- C8L-G02 Fast Single Frame Super-Resolution Using Perceptual Visibility Optimization..... 2716**
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- C8L-G03 High-Dynamic-Range Parallel Multi-Scale Retinex Enhancement with Spatially-Adaptive Prior 2720**
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- C8L-G04 A New Non-Local Video Denoising Scheme Using Low-Rank Representation and Total Variation Regularization 2724**
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University of Science and Technology of China, China
- C8L-G05 Spatial Error Concealment with Adaptive Linear Predictor 2728**
Jing Liu, Guangtao Zhai, Xiaokang Yang, Bing Yang
Shanghai Jiao Tong University, China

C8L-H: Memory Circuits and Architectures III

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 213

Chair(s): Mohsin Jamali, *University of Toledo*

Chip-Hong Chang, *Nanyang Technological University*

- C8L-H01 High-Throughput QC-LDPC Decoder with Cost-Effective Early Termination Scheme for Non-Volatile Memory Systems 2732**
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- C8L-H02 A 6T-4C Shadow Memory Using Plate Line and Word Line Boosting..... 2736**
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- C8L-H04 Hardware Transactional Memory on Multi-Processor FPGA Platform..... 2744**
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Universiti Teknologi Malaysia, Malaysia
- C8L-H05 Improved Charge Shared Scheme for Low-Energy Match Line Sensing in Ternary Content Addressable Memory 2748**
M.S. Islam¹, Syed Iftekhhar Ali²
¹*Bangladesh University of Engineering and Technology, Bangladesh;* ²*Islamic University of Technology, Bangladesh*

C8L-J: Interconnects, Clock, Noise Immunity & ESD Protection

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 216

Chair(s): Viktor Owall, *Lund University*
Koushik Maharatna, *University of Southampton*

- C8L-J01** **Low-Power All-Digital Manchester-Encoding-Based High-Speed SerDes Transceiver for on-Chip Networks 2752**
Abdelrahman Elsayed², Ramy Tadros¹, Maged Ghoneima¹, Yehea Ismail¹
¹American University in Cairo, Egypt; ²American University in Cairo / Zewail City of Science and Technology, Egypt
- C8L-J02** **Analysis of RLC Interconnect Delay Model Using Second Order Approximation 2756**
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University of Missouri - Kansas City, United States
- C8L-J03** **A Pulsed Resonance Clocking for Energy Recovery 2760**
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Santa Clara University, United States
- C8L-J04** **A Novel Dimensional Analysis Method for TSV Modeling and Analysis in Three Dimensional Integrated Circuits 2764**
Khaled Salah², Yehea Ismail¹
¹American University in Cairo, Egypt; ²Mentor Graphics Corporation, Egypt
- C8L-J05** **"Swimming Pool"-Like Distributed Architecture for Clock Generation in Large Many-Core SoC 2768**
Chuan Shan, François Anceau, Dimitri Galayko, Eldar Zianbetov
Laboratoire d'Informatique de Paris 6 / Université Pierre-et-Marie-Curie, France

C8L-K: Analysis, Implementation and Application of Nonlinear Circuits & Systems

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 219

Chair(s): Sergio Callegari, *University of Bologna*

Jinhu Lu, *RMIT University*

- C8L-K01 Distortion Contribution Analysis by Combining the Best Linear Approximation and Noise Analysis..... 2772**
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Vrije Universiteit Brussel, Belgium
- C8L-K02 Achievement of Preassigned Spectra in the Synthesis of Band-Pass Constant-Envelope Signals by Rapidly Hopping Through Discrete Frequencies 2776**
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- C8L-K03 Exploring Strategy Selection in Populations via a Continuous Evolutionary Game Dynamics..... 2780**
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¹*Academy of Mathematics and Systems Science, Chinese Academy of Sciences, China;* ²*Jagiellonian University, Poland;* ³*University of Pennsylvania, United States*
- C8L-K04 New Design Method of Sliding Mode Controller for a Class of Nonlinear Second-Order Systems 2784**
Shihong Ding¹, Wei Xing Zheng²
¹*Jiangsu University, China;* ²*University of Western Sydney, Australia*
- C8L-K05 Node Voltages in Nonlinear Resistive Circuits Enable New Approach to the Minimum Cut Problem..... 2788**
Masatoshi Sato³, Hisashi Aomori¹, Mamoru Tanaka²
¹*Chukyo University, Japan;* ²*Sophia University, Japan;* ³*Tokyo Metropolitan University, Japan*

C8L-L: SPECIAL SESSION: Towards Practical Homomorphic and Post-Quantum Cryptographic Architectures

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 220

Chair(s): Máire O'Neill, *Queen's University Belfast*
Berk Sunar, *Worcester Polytechnic Institute*

- C8L-L01** **Practical Homomorphic Encryption: a Survey 2792**
Ciara Moore¹, Máire O'Neill¹, Elizabeth O'Sullivan¹, Yarkin Doröz², Berk Sunar²
¹*Queen's University Belfast, United Kingdom*; ²*Worcester Polytechnic Institute, United States*
- C8L-L02** **Area Optimization of Lightweight Lattice-Based Encryption on Reconfigurable Hardware 2796**
Thomas Pöppelmann, Tim Güneysu
Ruhr-Universität Bochum, Germany
- C8L-L03** **Accelerating Leveled Fully Homomorphic Encryption Using GPU 2800**
Wei Wang, Zhilu Chen, Xinming Huang
Worcester Polytechnic Institute, United States
- C8L-L04** **On the Implementation of McEliece with CCA2 Indeterminacy by SHA-3 2804**
Santosh Ghosh
Intel Corporation, United States

C8L-M: CAS-FEST Special Session on Materials & Structure Optimization of Resistive Nanodevices

Time: Wednesday, June 4, 2014, 16:30 - 18:00

Room: 204

Chair(s): Cheol Seong Hwang, *Seoul National University*
Byung Joon Choi, *Seoul National University of Science and Technology*

- C8L-M01 Materials Understanding and Device Modeling of Memristive Switching.....No Paper**
John Paul Strachan
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- C8L-M02 New Materials for Memristive Switching..... 2808**
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- C8L-M03 Tunnel Junctions for Electroforming-Free Resistive Switching DevicesNo Paper**
Mirko Hansen¹, Martin Ziegler¹, Doo Soek Jeong², Thomas Mussenbrock³, Hermann Kohlstedt¹
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- C8L-M04 Transition from Threshold Switching to Memory Switching in Ag/SiO₂/Pt RRAMNo Paper**
Ming Liu, Qi Liu, Haitao Sun, Congfei Li, Hangbing Lv, Shibing Long
Institute of Microelectronics of Chinese Academy of Sciences, China
- C8L-M05 Mixed-Ionic-Electronic-Conduction (MIEC)-Based Access Devices for 3-D Multi-Layer Crosspoint Memory.....No Paper**
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- C8L-M06 The Short-Term Memory (D.C. Response) of the Memristor Demonstrates the Causes of the Memristor Frequency Effect 2812**
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