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# ISCAS 2013 Table of Contents

## **A1L-A: Multimedia Search and Interaction**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 301A

Chairs: Lu Yu, *Zhejiang University*

Tao Mei, *Microsoft Research Asia*

---

|                |   |           |
|----------------|---|-----------|
| <b>A1L-A.1</b> | <b>Image Search Reranking with Multi-Latent Topical Graph.....</b>  | <b>1</b>  |
|                | Junge Shen <sup>3</sup> , Tao Mei <sup>1</sup> , Qi Tian <sup>2</sup> , Xinbo Gao <sup>3</sup>  |           |
|                | <sup>1</sup> <i>Microsoft Research Asia, China</i> ; <sup>2</sup> <i>University of Texas at San Antonio, United States</i> ;  |           |
|                | <sup>3</sup> <i>Xidian University, China</i>  |           |
| <b>A1L-A.2</b> | <b>Context-Dependent Audio-Visual and Temporal Features Fusion for TV<br/>Commercial Detection .....</b>  | <b>5</b>  |
|                | Bo Zhang <sup>1</sup> , Jiancheng Zou <sup>2</sup> , Bo Xu <sup>1</sup>   |           |
|                | <sup>1</sup> <i>Institute of Automation, Chinese Academy of Sciences, China</i> ; <sup>2</sup> <i>North China<br/>University of Technology, China</i>                   |           |
| <b>A1L-A.3</b> | <b>Quality Perception in 3D Interactive Environments.....</b>   | <b>9</b>  |
|                | Alexandre Ciancio <sup>2</sup> , José Fernando de Oliveira <sup>2</sup> , Felipe Lopes Ribeiro <sup>2</sup> , Eduardo<br>da Silva <sup>2</sup> , Amir Said <sup>1</sup> |           |
|                | <sup>1</sup> <i>HP Labs, United States</i> ; <sup>2</sup> <i>Universidade Federal do Rio de Janeiro, Brazil</i>   |           |
| <b>A1L-A.4</b> | <b>A Gradient-Based Approach for Interference Cancellation in Systems with<br/>Multiple Kinect Cameras.....</b>   | <b>13</b> |
|                | Sen Xiang <sup>1</sup> , Li Yu <sup>1</sup> , Qiong Liu <sup>1</sup> , Zixiang Xiong <sup>2</sup>   |           |
|                | <sup>1</sup> <i>Huazhong University of Science and Technology, China</i> ; <sup>2</sup> <i>Texas A&amp;M University,<br/>United States</i>                              |           |
| <b>A1L-A.5</b> | <b>Rate-Distortion Optimization for Depth Map Coding with Distortion Estimation of<br/>Synthesized View .....</b>   | <b>17</b> |
|                | Li Wang, Lu Yu  |           |
|                | <i>Zhejiang University, China</i>   |           |

**A1L-B: Circuits and Systems for Energy Harvesting**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 301B

Chairs: Eduard Alarcon, *Technical University of Catalunya*  
Hirofusa Koizumi, *Tokyo University of Science*

---

|                |  |           |
|----------------|--|-----------|
| <b>A1L-B.1</b> | <b>Model and Design Considerations for Multistage Electrostatic Microgenerators .....</b>  | <b>21</b> |
|                | Yin Li, Manjusri Misra, Stefano Gregori<br><i>University of Guelph, Canada</i>   |           |
| <b>A1L-B.2</b> | <b>A Self-Sustaining Integrated CMOS Regulator for Solar and UHF RFID Energy Harvesting Systems .....</b>  | <b>25</b> |
|                | Tsung-Heng Tsai, Bo-Han Song<br><i>National Chung Cheng University, Taiwan</i>   |           |
| <b>A1L-B.3</b> | <b>Maximizing Efficiency Through Impedance Matching from a Circuit-Centric Model of Non-Radiative Resonant Wireless Power Transfer .....</b>   | <b>29</b> |
|                | Elisenda Bou <sup>1</sup> , Raymond Sedwick <sup>2</sup> , Eduard Alarcon <sup>1</sup><br><sup>1</sup> <i>Universitat Politècnica de Catalunya, Spain;</i> <sup>2</sup> <i>University of Maryland, College Park, United States</i> |           |
| <b>A1L-B.4</b> | <b>A Reconfigurable Micro Power Solar Energy Harvester for Ultra-Low Power Autonomous Microsystems .....</b>   | <b>33</b> |
|                | Naser Khosro Pour, Francois Krummenacher, Maher Kayal<br><i>École Polytechnique Fédérale de Lausanne, Switzerland</i>  |           |
| <b>A1L-B.5</b> | <b>Wide-Range, Reference Free, on-Chip Voltage Sensor for Variable Vdd Operations .....</b>  | <b>37</b> |
|                | Delong Shang, Fei Xia, Alex Yakovlev<br><i>Newcastle University, United Kingdom</i>  |           |

**A1L-C: High Efficiency Video Coding**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 302A

Chairs: Marco Mattavelli, EPFL

Oscar Au, Hong Kong University of Science & Technology

---

|                |  |           |
|----------------|--|-----------|
| <b>A1L-C.1</b> | <b>Multi Layer Based Rate Control Algorithm for HEVC .....</b>   | <b>41</b> |
|                | Shanshe Wang <sup>1</sup> , Siwei Ma <sup>2</sup> , Li Zhang <sup>2</sup> , Shiqi Wang <sup>2</sup> , Debin Zhao <sup>1</sup> , Wen Gao <sup>2</sup> |           |
|                | <i><sup>1</sup>Haerbin Institute of Technology, China; <sup>2</sup>Peking University, China</i>  |           |
| <b>A1L-C.2</b> | <b>Early Termination Schemes for Fast Intra Mode Decision in High Efficiency Video Coding .....</b>  | <b>45</b> |
|                | Hao Zhang <sup>1</sup> , Zhan Ma <sup>2</sup>  |           |
|                | <i><sup>1</sup>Central South University, China; <sup>2</sup>Samsung Telecommunications America, United States</i>                                    |           |
| <b>A1L-C.3</b> | <b>HEVC-Based Adaptive Quantization for Screen Content by Detecting Low Contrast Edge Regions.....</b>   | <b>49</b> |
|                | Hong Zhang, Oscar C. Au, Yongfang Shi, Xingyu Zhang, Ketan Tang, Yuanfang Guo  |           |
|                | <i>Hong Kong University of Science and Technology, Hong Kong</i>   |           |
| <b>A1L-C.4</b> | <b>Fast HEVC Intra Mode Decision Using Matching Edge Detector and Kernel Density Estimation Alike Histogram Generation.....</b>                      | <b>53</b> |
|                | Guang Chen <sup>1</sup> , Zhenyu Liu <sup>1</sup> , Takeshi Ikenaga <sup>2</sup> , Dongsheng Wang <sup>1</sup>                                       |           |
|                | <i><sup>1</sup>Tsinghua University, China; <sup>2</sup>Waseda University, Japan</i>  |           |
| <b>A1L-C.5</b> | <b>View Synthesis Prediction Using Skip and Merge Candidates for HEVC-Based 3D Video Coding .....</b>  | <b>57</b> |
|                | Feng Zou, Dong Tian, Anthony Vetro   |           |
|                | <i>Mitsubishi Electric Research Laboratories, United States</i>  |           |

**A1L-D: SDR/Cognitive Radio Systems**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 302B

Chair: Hassan Aboushady, *University of Pierre & Marie Curie*

---

|                |   |           |
|----------------|---|-----------|
| <b>A1L-D.1</b> | <b>A Cognitive Radio Receiver Front-End IC Based on Spread Spectrum Sensing Technique .....</b>   | <b>61</b> |
|                | Ying Zhang, Ali Meaamar, Yuanjin Zheng<br><i>Nanyang Technological University, Singapore</i>  |           |
| <b>A1L-D.2</b> | <b>DOA-Estimation and Source-Localization in CR-Networks Using Steerable 2-D IIR Beam Filters .....</b>   | <b>65</b> |
|                | Chamith Wijenayake <sup>1</sup> , Arjuna Madanayake <sup>1</sup> , Len Bruton <sup>2</sup> , Vijay Devabhaktuni <sup>3</sup><br><i><sup>1</sup>University of Akron, United States; <sup>2</sup>University of Calgary, Canada; <sup>3</sup>University of Toledo, United States</i>   |           |
| <b>A1L-D.3</b> | <b>Papoulis-Gerchberg Hybrid Filter Bank Receiver for Cognitive-/Software-Defined Radio Systems.....</b>  | <b>69</b> |
|                | José Pedro Magalhães <sup>3</sup> , Teófilo Monteiro <sup>3</sup> , José Manuel Neto Vieira <sup>3</sup> , Roberto Gómez-García <sup>2</sup> , Nuno Borges Carvalho <sup>1</sup><br><i><sup>1</sup>Instituto de Telecomunicações - Universidade de Aveiro, Portugal; <sup>2</sup>Universidad de Alcalá, Spain; <sup>3</sup>Universidade de Aveiro, Portugal</i> |           |
| <b>A1L-D.4</b> | <b>Variable Increment Step Based Reconfigurable Interleaver for Multimode Communication Application.....</b>  | <b>73</b> |
|                | Liang Tang, Jude Angelo Ambrose, Sri Parameswaran<br><i>University of New South Wales, Australia</i>  |           |
| <b>A1L-D.5</b> | <b>A Tunable Inductance Topology to Realize Frequency Tunable Matching Networks and Amplifiers .....</b>  | <b>77</b> |
|                | Dogu Çağdas Atilla <sup>2</sup> , Çağatay Aydın <sup>2</sup> , Ramazan Köprü <sup>1</sup> , Tayfun Nesimoglu <sup>3</sup> , Bekir Sýddýk Yarman <sup>2</sup><br><i><sup>1</sup>Isik University, Istanbul Technical University, Turkey; <sup>2</sup>Isik University, Istanbul University, Turkey; <sup>3</sup>Middle East Technical University, Turkey</i>       |           |

**A1L-E: Digital Filters**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 303A

Chairs: Yong Ching Lim, *Nanyang Technological University*  
Oscar Gustafsson, *Linköping University*

---

|                |  |           |
|----------------|--|-----------|
| <b>A1L-E.1</b> | <b>FIR Filter with Variable Fractional Delay and Phase Shift: Efficient Realization and Design Using Reweighted l1-Norm Minimization.....</b>  | <b>81</b> |
|                | Håkan Johansson, Amir Eghbali<br><i>Linköping University, Sweden</i>   |           |
| <b>A1L-E.2</b> | <b>Error Spectrum Shaping Approach for Lattice Filter Roundoff Noise Reduction.....</b>  | <b>85</b> |
|                | Yong Ching Lim <sup>2</sup> , Chaogeng Huang <sup>3</sup> , Gang Li <sup>3</sup> , Hong Xu <sup>3</sup> , Anthony G. Constantinides <sup>1</sup><br><sup>1</sup> <i>Imperial College London, United Kingdom</i> ; <sup>2</sup> <i>Nanyang Technological University, Singapore</i> ; <sup>3</sup> <i>Zhejiang University of Technology, China</i> |           |
| <b>A1L-E.3</b> | <b>Design of Two-Dimensional Notch Filter Using Bandpass Filter and Fractional Delay Filter .....</b>  | <b>89</b> |
|                | Chien-Cheng Tseng <sup>2</sup> , Su-Ling Lee <sup>1</sup><br><sup>1</sup> <i>Chang Jung Christian University, Taiwan</i> ; <sup>2</sup> <i>National Kaohsiung First University of Science and Technology, Taiwan</i>   |           |
| <b>A1L-E.4</b> | <b>Low-Complexity General FIR Filters Based on Winograd's Inner Product Algorithm .....</b>  | <b>93</b> |
|                | Oscar Gustafsson, Andreas Ehliar<br><i>Linköping University, Sweden</i>  |           |
| <b>A1L-E.5</b> | <b>Sparse FIR Filter Design Based on Genetic Algorithm.....</b>  | <b>97</b> |
|                | Heng Zhao, Wenbin Ye, Yajun Yu<br><i>Nanyang Technological University, Singapore</i>   |           |

**A1L-F: SPECIAL SESSION: Emerging Hybrid Logic Circuits Based on Magnetic Memories**

Time: Monday, May 20, 2013, 10:40 - 12:10  
Room: Room 303B  
Chairs: Weisheng Zhao, *University Pairs-Sud/CNRS*  
Guillaume Prenat, *French Atomic Agency*

---

- A1L-F.1 Trends on the Application of Emerging Nonvolatile Memory to Processors and Programmable Devices.....101**  
Lionel Torres, Raphael Brum, Vitorio Cargnini, Gilles Sassatelli  
*LIRMM University of Montpellier 2, France*
- A1L-F.2 MTJ/MOS-Hybrid Logic-Circuit Design Flow for Nonvolatile Logic-in-Memory LSI .....105**  
Masanori Natsui<sup>2</sup>, Takahiro Hanyu<sup>2</sup>, Noboru Sakimura<sup>1</sup>, Tadahiko Sugibayashi<sup>1</sup>  
<sup>1</sup>*NEC Corporation, Japan*; <sup>2</sup>*Tohoku University, Japan*
- A1L-F.3 A Comparative Study of STT-MTJ Based Non-Volatile Flip-Flops.....109**  
Taehui Na<sup>2</sup>, Kyungho Ryu<sup>2</sup>, Jisu Kim<sup>2</sup>, Seung Kang<sup>1</sup>, Seong-Ook Jung<sup>2</sup>  
<sup>1</sup>*Qualcomm incorporated, United States*; <sup>2</sup>*Yonsei University, Korea, South*
- A1L-F.4 MLC STT-RAM Design Considering Probabilistic and Asymmetric MTJ Switching .....113**  
Yaojun Zhang, Lu Zhang, Yiran Chen  
*University of Pittsburgh, United States*
- A1L-F.5 Challenge of MTJ/MOS-Hybrid Logic-in-Memory Architecture for Nonvolatile VLSI Processor.....117**  
Takahiro Hanyu  
*Tohoku University, Japan*



**A1L-G: Low Power Circuits I**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 305

Chairs: Izzet Kale, *University of Westminster*

Mladen Berekovic, *Institute of Computer and Network Engineering, TU Braunschweig*

---

|                |  |            |
|----------------|--|------------|
| <b>A1L-G.1</b> | <b>Design of a Low-Power Pulse-Triggered Flip-Flop with Conditional Clock Technique .....</b>  | <b>121</b> |
|                | Guangping Xiang, Jizhong Shen, Xuexiang Wu, Liang Geng<br><i>Zhejiang University, China</i>  |            |
| <b>A1L-G.2</b> | <b>A 32.4 <math>\mu</math>W RF Front End for 2.4 GHz Wake-Up Receiver .....</b>  | <b>125</b> |
|                | Yu Lin Tsou, Nai-Chen Daniel Cheng, Christina F. Jou<br><i>Industral Technique Research Institute, Taiwan</i>  |            |
| <b>A1L-G.3</b> | <b>A Dynamic-Adjusting Threshold-Voltage Scheme for FinFETs Low Power Designs .....</b>  | <b>129</b> |
|                | Xiaoxin Cui, Kaisheng Ma, Kai Liao, Nan Liao, Di Wu, Wei Wei, Rui Li, Dunshan Yu<br><i>Peking University, China</i>  |            |
| <b>A1L-G.4</b> | <b>Near-/Sub-V<sub>th</sub> Process, Voltage, and Temperature (PVT) Sensors with Dynamic Voltage Selection .....</b>   | <b>133</b> |
|                | Ming-Hung Chang <sup>2</sup> , Shang-Yuan Lin <sup>2</sup> , Pei-Chen Wu <sup>2</sup> , Olesya Zakoretska <sup>2</sup> ,<br>Ching-Te Chuang <sup>2</sup> , Kuan-Neng Chen <sup>2</sup> , Chen-Chao Wang <sup>1</sup> , Kua-Hua Chen <sup>1</sup> , Chi-Tsung Chiu <sup>1</sup> , Ho-Ming Tong <sup>1</sup> , Wei Hwang <sup>2</sup><br><sup>1</sup> <i>Advanced Semiconductor Engineering Group, Taiwan</i> ; <sup>2</sup> <i>National Chiao Tung University, Taiwan</i> |            |
| <b>A1L-G.5</b> | <b>Ultra-Low-Power High Sensitivity Spike Detectors Based on Modified Nonlinear Energy Operator .....</b>  | <b>137</b> |
|                | Yang-Guo Li <sup>1</sup> , Qingyun Ma <sup>1</sup> , Mohammad Haider <sup>1</sup> , Yehia Massoud <sup>2</sup><br><sup>1</sup> <i>University of Alabama at Birmingham, United States</i> ; <sup>2</sup> <i>Worcester Polytechnic Institute, United States</i>  |            |

**A1L-H: Analog to Digital Convertors**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 306A

Chairs: Shahriar Mirabbasi, *University of British Columbia*  
George Yuan, *Hong Kong University of Science & Technology*

---

|                |   |            |
|----------------|---|------------|
| <b>A1L-H.1</b> | <b>A Current-Mode Flash ADC for Low-Power Continuous-Time Sigma Delta Modulators .....</b>  | <b>141</b> |
|                | Chang-Joon Park <sup>2</sup> , Hemasundar Mohan Geddada <sup>2</sup> , Aydin Ilker Karsilayan <sup>2</sup> , Jose Silva-Martinez <sup>2</sup> , Marvin Onabajo <sup>1</sup> |            |
|                | <sup>1</sup> <i>Northeastern University, United States</i> ; <sup>2</sup> <i>Texas A&amp;M University, United States</i>  |            |
| <b>A1L-H.2</b> | <b>A Current Mode 6-bit Self-Clocked Tracking ADC with Adaptive Clock Frequency for DC-DC Converters .....</b>  | <b>145</b> |
|                | Yan Huang <sup>1</sup> , Horst Schleifer <sup>2</sup> , Dirk Killat <sup>1</sup>  |            |
|                | <sup>1</sup> <i>Brandenburg university of technology, Germany</i> ; <sup>2</sup> <i>Dialog Semiconductor, Germany</i>   |            |
| <b>A1L-H.3</b> | <b>A Frequency-Folded ADC Architecture with Digital LO Synthesis.....</b>   | <b>149</b> |
|                | Travis Forbes, Wei-Gi Ho, Nan Sun, Ranjit Gharpurey   |            |
|                | <i>University of Texas at Austin, United States</i>   |            |
| <b>A1L-H.4</b> | <b>A Merged First and Second Stage for Low Power Pipelined ADC.....</b>   | <b>153</b> |
|                | Changyi Yang, Weitao Li, Fule Li, Zhihua Wang   |            |
|                | <i>Tsinghua University, China</i>   |            |
| <b>A1L-H.5</b> | <b>High-Order Multi-Bit Incremental Converter with Smart-DEM Algorithm .....</b>  | <b>157</b> |
|                | Yao Liu, Edoardo Bonizzoni, Franco Maloberti  |            |
|                | <i>Università degli Studi di Pavia, Italy</i>   |            |

**A1L-J: Wireless Circuits**

Time: Monday, May 20, 2013, 10:40 - 12:10  
Room: Room 306B  
Chairs: Jorge Fernandes, *Instituto Superior Técnico*  
Luis Oliveira, *Tech. University of Lisbon*

---

|                |  |            |
|----------------|--|------------|
| <b>A1L-J.1</b> | <b>A Configurable Multi-Band GNSS Receiver for Compass/GPS/Galileo Applications .....</b>  | <b>161</b> |
|                | Zhong Zhang, Weimin Li, Wu Wen, Wei Wu, Yongfeng Li<br><i>Beijing Microelectronics Technology Institute, China</i>   |            |
| <b>A1L-J.2</b> | <b>A Spur Cancellation Technique for MDLL-Based Frequency Synthesizers .....</b>   | <b>165</b> |
|                | Giovanni Marzin, Andrea Fenaroli, Giovanni Marucci, Salvatore Levantino, Carlo Samori, Andrea Lacaita<br><i>Politecnico di Milano, Italy</i>   |            |
| <b>A1L-J.3</b> | <b>A Wide Bandwidth Fractional-N Synthesizer for LTE with Phase Noise Cancellation Using a Hybrid-Delta-Sigma-DAC and Charge Re-Timing .....</b>   | <b>169</b> |
|                | Dawei Ye <sup>2</sup> , Ping Lu <sup>1</sup> , Pietro Andreani <sup>1</sup> , Ronan van der Zee <sup>2</sup><br><sup>1</sup> <i>Lund University, Sweden</i> ; <sup>2</sup> <i>Universiteit Twente, Netherlands</i> |            |
| <b>A1L-J.4</b> | <b>Minimum-Jitter Design of Bang-Bang PLLs in the Presence of 1/F<sup>2</sup> and 1/F<sup>3</sup> DCo Noise.....</b>   | <b>173</b> |
|                | Giovanni Marucci, Salvatore Levantino, Paolo Maffezzoni, Carlo Samori<br><i>Politecnico di Milano, Italy</i>   |            |
| <b>A1L-J.5</b> | <b>Phase-Locked Loop Based PWM Wireless Transmitter .....</b>  | <b>177</b> |
|                | Jingxue Lu, Ranjit Gharpurey<br><i>University of Texas at Austin, United States</i>  |            |

**A1L-K: Biomedical Circuits**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 307A

Chairs: Tor Sverre Lande, *University of Oslo*  
Kea-Tiong Tang, *National Tsing Hua University*

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|                |   |            |
|----------------|---|------------|
| <b>A1L-K.1</b> | <b>A Highly Linear, Sigma-Delta Based, Sub-Hz High-Pass Filtered ExG Readout System.....</b>  | <b>181</b> |
|                | Rachit Mohan <sup>2</sup> , Senad Hiseni <sup>1</sup> , Wouter A. Serdijn <sup>1</sup><br><sup>1</sup> <i>Delft University of Technology, Netherlands</i> ; <sup>2</sup> <i>Interuniversity Microelectronics Center, Belgium</i>  |            |
| <b>A1L-K.2</b> | <b>REFET Replication for ISFET-Based SNP Detection Arrays .....</b>   | <b>185</b> |
|                | Mohammadreza Sohbaty, Pantelis Georgiou, Christofer Toumazou<br><i>Imperial College London, United Kingdom</i>  |            |
| <b>A1L-K.3</b> | <b>A Direct-Capacitive Feedback ISFET Interface for pH Reaction Monitoring .....</b>  | <b>189</b> |
|                | Yuanqi Hu, Pantelis Georgiou<br><i>Imperial College London, United Kingdom</i>  |            |
| <b>A1L-K.4</b> | <b>A Floating Active Inductor Based CMOS Cochlea Filter with High Tunability and Sharp Cut-Off.....</b>   | <b>193</b> |
|                | Shiwei Wang <sup>1</sup> , Thomas Jacob Koickal <sup>1</sup> , Alister Hamilton <sup>1</sup> , Enrico Mastropaolo <sup>1</sup> ,<br>Rebecca Cheung <sup>1</sup> , Leslie Smith <sup>2</sup><br><sup>1</sup> <i>University of Edinburgh, United Kingdom</i> ; <sup>2</sup> <i>University of Stirling, United Kingdom</i> |            |
| <b>A1L-K.5</b> | <b>PLL-Based High-Speed Demodulation of FM Signals for Real-Time AFM Applications .....</b>   | <b>197</b> |
|                | Benedikt Schlecker <sup>2</sup> , Maurits Ortmanns <sup>2</sup> , Jens Anders <sup>2</sup> , Georg Fantner <sup>1</sup><br><sup>1</sup> <i>Ecole Polytechnique Federale de Lausanne, Switzerland</i> ; <sup>2</sup> <i>Universität Ulm, Germany</i>   |            |

**A1L-L: SPECIAL SESSION: Theory of Memristors**

Time: Monday, May 20, 2013, 10:40 - 12:10

Room: Room 307B

Chair: Ronald Tetzlaff, *Technische Universität Dresden*

---

- A1L-L.1 Some Fingerprints of Ideal Memristors.....201**  
Dalibor Biolek<sup>2</sup>, Zdenek Biolek<sup>1</sup>, Viera Biolková<sup>1</sup>, Zdenek Kolka<sup>1</sup>  
<sup>1</sup>Brno University of Technology, Czech Rep.; <sup>2</sup>Brno University of Technology /  
University of Defence, Czech Rep.
- A1L-L.2 PSpice Switch-Based Versatile Memristor Model .....205**  
Alon Ascoli<sup>2</sup>, Ronald Tetzlaff<sup>2</sup>, Fernando Corinto<sup>1</sup>, Marco Gilli<sup>1</sup>  
<sup>1</sup>Politecnico di Torino, Italy; <sup>2</sup>Technische Universität Dresden, Germany
- A1L-L.3 Composite Memristance of Parallel and Serial Memristor Circuits.....209**  
Ram Kaji Budhathoki, Maheshwar Prasad Sah, Shyam Prasad Adhikari,  
Hyongsuk Kim  
*Chonbuk National University, Korea, South*
- A1L-L.4 Unified Modeling for Memristive Devices Based on Charge-Flux Constitutive  
Relationships .....213**  
Le Zheng, Sangho Shin, Sung-Mo Kang  
*University of California, Santa Cruz, United States*
- A1L-L.5 Physics-Based Memristor Models .....217**  
Stanley Williams, Matthew Pickett, John Paul Strachan  
*Hewlett-Packard Laboratories, United States*

**A2L-A: Multimedia Coding**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 301A

Chairs: Kai-Kuang Ma, *Nanyang Technological University*  
Feng Wu, *Microsoft Research Asia*

---

- A2L-A.1 A Joint Reconstruction Algorithm for Multi-View Compressed Imaging.....221**  
Kan Chang<sup>2</sup>, Tuanfa Qin<sup>2</sup>, Wenbo Xu<sup>1</sup>, Aidong Men<sup>1</sup>  
<sup>1</sup>*Beijing University of Posts and Telecommunications, China*; <sup>2</sup>*Guangxi university, China*
- A2L-A.2 Content Based Fast Prediction Unit Quadtree Depth Decision Algorithm for HEVC .....225**  
Yongfang Shi, Oscar C. Au, Xingyu Zhang, Hong Zhang, Rui Ma, Luheng Jia  
*Hong Kong University of Science and Technology, Hong Kong*
- A2L-A.3 Partial Encryption by Randomized Zig-Zag Scanning for Video Encoding .....229**  
Yongsheng Wang, Maire O'Neill, Fatih Kurugollu  
*Queen's University Belfast, United Kingdom*
- A2L-A.4 A Parallel Deblocking Filter Based on H.264/AVC Video Coding Standard.....233**  
Jiali Li<sup>1</sup>, Oscar C. Au<sup>1</sup>, Lu Fang<sup>2</sup>, Lin Sun<sup>1</sup>, Wenxiu Sun<sup>1</sup>, Dinuka A. Soysa<sup>1</sup>  
<sup>1</sup>*Hong Kong University of Science and Technology, Hong Kong*; <sup>2</sup>*University of Science and Technology of China, China*
- A2L-A.5 Rate-Distortion Optimized Block Classification and Bit Allocation in Screen Video Compression.....237**  
Chao Pang<sup>1</sup>, Oscar C. Au<sup>1</sup>, Jingjing Fu<sup>2</sup>, Yan Lu<sup>2</sup>, Shipeng Li<sup>2</sup>  
<sup>1</sup>*Hong Kong University of Science and Technology, Hong Kong*; <sup>2</sup>*Microsoft Research Asia, China*

**A2L-B: Circuits and Systems for Renewable Power Sources**

Time: Monday, May 20, 2013, 13:40 - 15:10  
Room: Room 301B  
Chairs: Ka Lok Man, *Xi'an Jiaotong-Liverpool Univ.*  
Hirotaka Koizumi, *Tokyo University of Science*

---

|                |   |            |
|----------------|---|------------|
| <b>A2L-B.1</b> | <b>A Hybrid MPPT Method for Photovoltaic Systems via Estimation and Revision Method.....</b>  | <b>241</b> |
|                | Jieming Ma <sup>2</sup> , Ka Lok Man <sup>3</sup> , Tiew On Ting <sup>3</sup> , Nan Zhang <sup>3</sup> , Chi-Un Lei <sup>1</sup> , Ngai Wong <sup>1</sup><br><sup>1</sup> <i>University of Hong Kong, Hong Kong;</i> <sup>2</sup> <i>University of Liverpool, United Kingdom;</i><br><sup>3</sup> <i>Xi'an Jiaotong-Liverpool University, China</i> |            |
| <b>A2L-B.2</b> | <b>Low-Cost Global MPPT Scheme for Photovoltaic Systems Under Partially Shaded Conditions.....</b>  | <b>245</b> |
|                | Jieming Ma <sup>2</sup> , Ka Lok Man <sup>3</sup> , Tiew On Ting <sup>3</sup> , Nan Zhang <sup>3</sup> , Chi-Un Lei <sup>1</sup> , Ngai Wong <sup>1</sup><br><sup>1</sup> <i>University of Hong Kong, Hong Kong;</i> <sup>2</sup> <i>University of Liverpool, United Kingdom;</i><br><sup>3</sup> <i>Xi'an Jiaotong-Liverpool University, China</i> |            |
| <b>A2L-B.3</b> | <b>Distributed Control of Reactive Power from Photovoltaic Inverters .....</b>  | <b>249</b> |
|                | Soumya Kundu <sup>2</sup> , Scott Backhaus <sup>1</sup> , Ian Hiskens <sup>2</sup><br><sup>1</sup> <i>Los Alamos National Laboratory, United States;</i> <sup>2</sup> <i>University of Michigan, United States</i>  |            |
| <b>A2L-B.4</b> | <b>Battery-Assisted and Photovoltaic-Sourced Switched-Inductor CMOS Harvesting Charger—Supply .....</b>   | <b>253</b> |
|                | Rajiv Damodaran Prabha, Gabriel Rincón-Mora<br><i>Georgia Institute of Technology, United States</i>  |            |

**A2L-C: Advanced Visual Signal Coding I**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 302A

Chairs: Wan-Chi Siu, *Hong Kong Polytechnic University*

Yo-Sung Ho, *Gwangju Institute of Science and Technology, Korea*

---

- A2L-C.1 Low-Complexity Feedback-Channel-Free Distributed Video Coding with Enhanced Classifier .....257**  
Yuh-Jiun Wang<sup>2</sup>, Szu-Lu Hsu<sup>2</sup>, Teng-Yuan Cheng<sup>2</sup>, Chia-Han Lee<sup>1</sup>, Shao-Yi Chien<sup>2</sup>  
<sup>1</sup>*Academia Sinica, Taiwan*; <sup>2</sup>*National Taiwan University, Taiwan*
- A2L-C.2 Multiple Description Coding with Randomly Offset Quantizers .....261**  
Lili Meng<sup>1</sup>, Jie Liang<sup>4</sup>, Upul Samarawickrama<sup>3</sup>, Yao Zhao<sup>1</sup>, Huihui Bai<sup>1</sup>, Andre Kaup<sup>2</sup>  
<sup>1</sup>*Beijing Jiaotong University, China*; <sup>2</sup>*Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*; <sup>3</sup>*Microsoft Corporation, United States*; <sup>4</sup>*Simon Fraser University, Canada*
- A2L-C.3 Improved Hierarchical Intra Prediction Based on Adaptive Interpolation Filtering for Lossless Compression .....265**  
Li-Li Wang, Wan-Chi Siu  
*Hong Kong Polytechnic University, Hong Kong*
- A2L-C.4 Region-Based Weighted Prediction Algorithm for H.264/AVC Video Coding .....269**  
Sik-Ho Tsang, Tsz-Kwan Lee, Yui-Lam Chan, Wan-Chi Siu  
*Hong Kong Polytechnic University, Hong Kong*
- A2L-C.5 Content-Aware Write Reduction Mechanism of Phase-Change Ram Based Frame Store in H.264 Video Codec System .....273**  
Sanchuan Guo, Zhenyu Liu, Guohong Li, Dongsheng Wang  
*Tsinghua University, China*



**A2L-D: Circuits and Systems for Communication I**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 302B

Chair: Zhiyuan Yan, *Lehigh University*

---

- A2L-D.1 Performance of a Multiple-Access DCSK-CC System Over Nakagami-m Fading Channels .....277**  
Yi Fang<sup>2</sup>, Lin Wang<sup>2</sup>, Guanrong Chen<sup>1</sup>  
*<sup>1</sup>City University of Hong Kong, Hong Kong; <sup>2</sup>Xiamen University, China*
- A2L-D.2 Forward Error Correction with RaptorQ Code on GPU.....281**  
Linjia Hu<sup>2</sup>, Saeid Nooshabadi<sup>2</sup>, Todor Mladenov<sup>1</sup>  
*<sup>1</sup>Intel, Germany; <sup>2</sup>Michigan Technological University, United States*
- A2L-D.3 Design and Implementation of an ML Decoder for Tail-Biting Convolutional Codes .....285**  
Farhan Bin Khalid, Shahid Masud, Momin Uppal  
*Lahore University of Management Sciences, Pakistan*
- A2L-D.4 Fully Integrated Passive UHF RFID Transponder IC with a Sensitivity of -12 dBm .....289**  
Jinpeng Shen, Xin'An Wang, Bo Wang, Shan Liu, Shoucheng Li, Zhengkun Ruan, Xiangrong Zhang, Ying Cao  
*Peking University, China*
- A2L-D.5 Hardware Acceleration of the Robust Header Compression (RoHC) Algorithm.....293**  
Mohammed Al-Obaidi<sup>2</sup>, Harshavardhan Kittur<sup>2</sup>, Håkan Andersson<sup>1</sup>, Viktor Öwall<sup>2</sup>  
*<sup>1</sup>Ericsson AB, Sweden; <sup>2</sup>Lund University, Sweden*

**A2L-E: Speech and Audio Processing**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 303A

Chairs: Yoshikazu Miyanaga, *Hokkaido University*

Omair Ahmad, *Concordia University*

---

- A2L-E.1 A Detection Method of Nasalised Vowels Based on an Acoustic Parameter Derived from Phase Spectrum .....297**  
Celia Shahnaz<sup>1</sup>, Shamima Najnin<sup>1</sup>, Shaikh Anowarul Fattah<sup>1</sup>, Wei-Ping Zhu<sup>2</sup>, M. Omair Ahmad<sup>2</sup>  
<sup>1</sup>*Bangladesh University of Engineering and Technology, Bangladesh;* <sup>2</sup>*Concordia University, Canada*
- A2L-E.2 Improved Structural Similarity Measurement for Vocal Signals .....301**  
Wei-Sheng Lai<sup>2</sup>, Chi-Jung Tseng<sup>1</sup>, Jian-Jiun Ding<sup>2</sup>  
<sup>1</sup>*Chihlee Institute of Technology, Taiwan;* <sup>2</sup>*National Taiwan University, Taiwan*
- A2L-E.3 Auditory Features Based on Gammatone Filters for Robust Speech Recognition .....305**  
Jun Qi, Dong Wang, Yi Jiang, Runsheng Liu  
*Tsinghua University, China*
- A2L-E.5 Evaluation of Detailed Modeling of the LP Residual in Statistical Speech Synthesis .....313**  
Jani Nurminen, Hanna Silén, Elina Helander, Moncef Gabbouj  
*Tampere University of Technology, Finland*

**A2L-F: SPECIAL SESSION: Silicon Photonics Based On-chip Architectures**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 303B

Chairs: Sebastien Le Beux, *Ecole Centrale de Lyon*  
Ian O'Connor, *Ecole Centrale de Lyon*

---

- A2L-F.1 Potential and Pitfalls of Silicon Photonics Computing and Interconnect.....317**  
Sébastien Le Beux<sup>2</sup>, Ian O'Connor<sup>2</sup>, Zhen Li<sup>2</sup>, Xavier Letartre<sup>2</sup>, Christelle Monat<sup>2</sup>,  
Jelena Trajkovic<sup>1</sup>, Gabriela Nicolescu<sup>3</sup>  
<sup>1</sup>Concordia University, Canada; <sup>2</sup>École Centrale de Lyon, France; <sup>3</sup>École  
Polytechnique de Montréal, Canada
- A2L-F.2 System-Level Analysis of Mesh-Based Hybrid Optical-Electronic Network-on-  
Chip .....321**  
Yaoyao Ye, Xiaowen Wu, Jiang Xu, Mahdi Nikdast, Zhehui Wang, Xuan Wang,  
Zhe Wang  
*Hong Kong University of Science and Technology, China*
- A2L-F.3 MHYNESYS II: Multi-Stage Hybrid Network on Chip Synthesis for Next  
Generation 3D IC Manycore .....325**  
Omar Hammami, Khawla Hamwi  
*ENSTA PARISTECH, France*
- A2L-F.5 Recent Advances in Optical Reservoir Computing .....333**  
François Duport<sup>3</sup>, Anteo Smerieri<sup>2</sup>, Yvan Paquot<sup>2</sup>, Bendix Schneider<sup>1</sup>, Joni  
Dambre<sup>1</sup>, Benjamin Schrauwen<sup>1</sup>, Marc Haeltermann<sup>2</sup>, Serge Massar<sup>2</sup>  
<sup>1</sup>Gent University, Belgium; <sup>2</sup>Université Libre de Bruxelles, Belgium; <sup>3</sup>Université Libre  
de Bruxelles, Belgium

**A2L-G: Low-Power Logic & Architectures I**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 305

Chairs: Vasily Moshnyaga, *Fukuoka University*

Tso-Bing Juang, *National Pingtung Institute of Commerce*

---

- A2L-G.1 Enabling Near-Threshold Voltage(NTV) Operation in Multi-VDD Cache for Power Reduction .....337**  
Yinhe Han, Ying Wang, Huawei Li, Xiaowei Li  
*Institute of Computing Technology, Chinese Academy of Sciences, China*
- A2L-G.2 Low Complexity Image Rejection Demodulator for Bluetooth LE Applications .....341**  
Ye Zhang, Ralf Wunderlich, Stefan Heinen  
*RWTH Aachen University, Germany*
- A2L-G.3 Power Optimization in a Parallel Multiplier Using Voltage Islands.....345**  
Seok Won Heo<sup>2</sup>, Suk Joong Huh<sup>1</sup>, Milos Ercegovic<sup>2</sup>  
<sup>1</sup>*Samsung Electronics, Korea, South;* <sup>2</sup>*University of California, Los Angeles, United States*
- A2L-G.4 A Low Power Register File with Asynchronously Controlled Read-Isolation and Software-Directed Write-Discarding .....349**  
Zheng Yu, Jiajie Zhang, Xueqiu Yu, Xiaoyang Zeng, Zhiyi Yu  
*Fudan University, China*
- A2L-G.5 Low Power Sub-Threshold Asynchronous QDI Static Logic Transistor-Level Implementation (SLTI) 32-Bit ALU .....353**  
Weng-Geng Ho, Kwen-Siong Chong, Bah-Hwee Gwee, Joseph Chang  
*Nanyang Technological University, Singapore*

**A2L-H: Data Convertors I**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 306A

Chairs: João Goes, *Universidade Nova de Lisboa*  
Albert Wang, *University of California, Riverside*

---

- A2L-H.1 Mitigating Timing Errors in Time-Interleaved ADCs : a Signal Conditioning Approach.....357**  
Abhishek Ghosh, Sudhakar Pamarti  
*University of California, Los Angeles, United States*
- A2L-H.2 10b 150MS/s 0.4mm<sup>2</sup> 45nm CMOS ADC Based on Process-Insensitive Amplifiers.....361**  
Tai-Ji An, Jun-Sang Park, Yong-Min Kim, Suk-Hee Cho, Gil-Cho Ahn, Seung-Hoon Lee  
*Sogang University, Korea, South*
- A2L-H.3 A 5-bit 1.5GSps Calibration-Less Binary Search ADC Using Threshold Reconfigurable Comparators.....365**  
Taimur Rabuske<sup>1</sup>, Fabio Rabuske<sup>2</sup>, Jorge Fernandes<sup>1</sup>, Cesar Rodrigues<sup>2</sup>  
<sup>1</sup>*INESC-ID - Universidade Técnica de Lisboa, Portugal*; <sup>2</sup>*Universidade Federal de Santa Maria / GMicro, Brazil*
- A2L-H.4 Rigorous Analysis of Quantization Error of an A/D Converter Based on  $\beta$ -Map .....369**  
Takaki Makino<sup>4</sup>, Yukiko Iwata<sup>1</sup>, Yutaka Jitsumatsu<sup>2</sup>, Masao Hotta<sup>3</sup>, Hao San<sup>3</sup>, Kazuyuki Aihara<sup>4</sup>  
<sup>1</sup>*FIRST, Aihara Innovative Mathematical Modelling Project, Japan Science and Technology Agency, Japan*; <sup>2</sup>*Kyushu University, Japan*; <sup>3</sup>*Tokyo City University, Japan*; <sup>4</sup>*University of Tokyo, Japan*
- A2L-H.5 A Continuous-Time VCO-Assisted VCO-Based Sigma Delta Modulator with 76.6dB SNDR and 10MHz BW.....373**  
Yun Du, Tao He, Yang Jiang, Sai-Weng Sin, Seng-Pan U, Rui-Paulo Martins  
*Universidade de Macau, Macau*

**A2L-J: Amplifiers I**

Time: Monday, May 20, 2013, 13:40 - 15:10  
Room: Room 306B  
Chairs: Robert Sobot, *University of West Ontario*  
Igor Filanovsky, *University of Alberta*

---

|                |   |            |
|----------------|---|------------|
| <b>A2L-J.1</b> | <b>Linearization of Subthreshold Low-Noise Amplifiers .....</b>   | <b>377</b> |
|                | Chun-Hsiang Chang, Marvin Onabajo<br><i>Northeastern University, United States</i>  |            |
| <b>A2L-J.2</b> | <b>Frequency Compensation of High-Speed, Low-Voltage CMOS Multistage Amplifiers .....</b>   | <b>381</b> |
|                | Syed Ahmed Aamir <sup>2</sup> , Prakash Harikumar <sup>1</sup> , Jacob Wikner <sup>1</sup><br><sup>1</sup> <i>Linköping University, Sweden</i> ; <sup>2</sup> <i>Universität Bielefeld, Germany</i>   |            |
| <b>A2L-J.3</b> | <b>1V Rail-to-Rail Constant Gm Amplifier with Common-Mode Elimination Technique .....</b>   | <b>385</b> |
|                | Boram Lee, Ted Higman<br><i>University of Minnesota, United States</i>  |            |
| <b>A2L-J.4</b> | <b>An Inductorless Wideband Low Noise Amplifier with Current Reuse and Linearity Enhancement.....</b>   | <b>389</b> |
|                | Chuan Qin <sup>2</sup> , Lei Zhang <sup>2</sup> , Yan Wang <sup>2</sup> , Zhiping Yu <sup>2</sup> , Dajie Zeng <sup>1</sup><br><sup>1</sup> <i>Suzhou Institute of Nano-Tech and Nano-Bionics, China</i> ; <sup>2</sup> <i>Tsinghua University, China</i> |            |
| <b>A2L-J.5</b> | <b>A Current-Mirror Opamp with Switchable Transconductances for Low-Power Switched-Capacitor Integrators .....</b>  | <b>393</b> |
|                | Mostafa Haroun, Anas Hamoui<br><i>McGill University, Canada</i>   |            |

**A2L-K: Circuits for Bio-potential Acquisition**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 307A

Chairs: George Yuan, *Hong Kong University of Science & Technology*  
Mohamad Sawan, *Polytechnique Montreal*

---

- A2L-K.1 A Multi-Channel Multi-Mode Physiological Signals Acquisition and Analysis Platform.....397**  
Sheng-Cheng Lee, Tsan-Jieh Chen, Harming Chiueh  
*National Chiao Tung University, Taiwan*
- A2L-K.2 A Bidirectional Neural Interface with a HV Stimulator and a LV Neural Amplifier .....401**  
Ulrich Bihl, Thomas Ungru, Hongcheng Xu, Jens Anders, Joachim Becker,  
Maurits Ortmanns  
*Universität Ulm, Germany*
- A2L-K.3 A 1.83  $\mu$ W, 0.78  $\mu$ Vrms Input Referred Noise Neural Recording Front End .....405**  
Jiangchao Wu, Man-Kay Law, Pui-In Mak, Rui-Paulo Martins  
*Universidade de Macau, Macau*
- A2L-K.4 A Current-Mode Stimulator Circuit with Two-Step Charge Balancing Background Calibration.....409**  
Anh Tuan Do, Yung Sern Tan, Gordon Minru Xiong, Cleo Choong, Zhi Hui Kong,  
Kiat Seng Yeo  
*Nanyang Technological University, Singapore*
- A2L-K.5 A VLSI Design of Singular Value Decomposition Processor Used in Real-Time ICA Computation for Multi-Channel EEG System .....413**  
Kuan-Ju Huang, Wei-Yeh Shih, Jui-Chieh Liao, Wai-Chi Fang  
*National Chiao Tung University, Taiwan*

**A2L-L: SPECIAL SESSION: Memristor-based Neural Circuitry**

Time: Monday, May 20, 2013, 13:40 - 15:10

Room: Room 307B

Chairs: Fernando Corinto, *Politecnico di Torino*  
Sung-Mo Steve Kang, *University of California at Santa Cruz*

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- A2L-L.1 Memristor—Based Neural Circuits .....417**  
Fernando Corinto<sup>1</sup>, Alon Ascoli<sup>1</sup>, Sung-Mo Kang<sup>2</sup>  
*<sup>1</sup>Politecnico di Torino, Italy; <sup>2</sup>University of California, Santa Cruz, United States*
- A2L-L.2 Features of Memristor Emulator-Based Artificial Neural Synapses .....421**  
Maheshwar Prasad Sah, Changju Yang, Ram Kaji Budhathoki, Hyongsuk Kim  
*Chonbuk National University, Korea, South*
- A2L-L.3 Temporal Processing with Volatile Memristors .....425**  
Radu Berdan<sup>1</sup>, Themistoklis Prodromakis<sup>1</sup>, Ali Khat<sup>1</sup>, Iulia Salaoru<sup>1</sup>, Christofer  
Toumazou<sup>1</sup>, Fernando Perez-Diaz<sup>2</sup>, Eleni Vasilaki<sup>2</sup>  
*<sup>1</sup>Imperial College London, United Kingdom; <sup>2</sup>University of Sheffield, United Kingdom*
- A2L-L.4 Analysis of Multi-Memristor Circuits .....429**  
Ute Feldmann<sup>2</sup>, Torsten Schmidt<sup>1</sup>, Ronald Tetzlaff<sup>2</sup>  
*<sup>1</sup>Hochschule Ansbach, Germany; <sup>2</sup>Technische Universität Dresden, Germany*



**A3L-A: Multimedia Transport and System**

Time: Monday, May 20, 2013, 15:30 - 17:00  
Room: Room 301A  
Chairs: Yap-Peng Tan, *Nanyang Technological University*  
Ling Guan, *Ryerson University*

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|                |  |            |
|----------------|--|------------|
| <b>A3L-A.1</b> | <b>A Fast Rate Adaptation Scheme for SVC Based on the Packet Dependencies .....</b>  | <b>433</b> |
|                | Maodong Li <sup>2</sup> , Zhenzhong Chen <sup>1</sup> , Seong-Ping Chuah <sup>2</sup> , Yap-Peng Tan <sup>2</sup><br><i><sup>1</sup>MediaTek USA Inc., United States; <sup>2</sup>Nanyang Technological University, Singapore</i>  |            |
| <b>A3L-A.2</b> | <b>Lifetime Elongation of Event-Driven Wireless Video Sensor Networks.....</b>   | <b>437</b> |
|                | Jeonghoon Jang, Giwon Kim, Chong Min Kyung<br><i>Korea Advanced Institute of Science and Technology, Korea, South</i>  |            |
| <b>A3L-A.3</b> | <b>Adaptive Mode and Modulation Coding Switching Scheme in MIMO Multicasting System.....</b>   | <b>441</b> |
|                | Xiang Chen <sup>3</sup> , Jenq-Neng Hwang <sup>3</sup> , Po-Han Wu <sup>3</sup> , Hsuan-Jung Su <sup>2</sup> , Chung-Nan Lee <sup>1</sup><br><i><sup>1</sup>National Sun Yat-Sen University, Taiwan; <sup>2</sup>National Taiwan University, Taiwan; <sup>3</sup>University of Washington, United States</i> |            |
| <b>A3L-A.4</b> | <b>A Collusion-Free Key Assignment Scheme for Hierarchical Access Control Using Recursive Hash Chains .....</b>  | <b>445</b> |
|                | Shoko Imaizumi<br><i>Chiba University, Japan</i>   |            |
| <b>A3L-A.5</b> | <b>Optimal Resource Allocation for Multimedia Application Providers in Multi-Site Cloud .....</b>  | <b>449</b> |
|                | Xiaoming Nan, Yifeng He, Ling Guan<br><i>Ryerson University, Canada</i>  |            |

**A3L-B: Smart Grids and Sustainability I**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 301B

Chairs: Chika Nwankpa, *Drexel University*

Luis F. C. Alberto, *University of Sao Paulo*

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- A3L-B.1 Identifying Groups of Preventive Controls for a Set of Critical Contingencies in the Context of Voltage Stability .....453**  
Moussa Mansour, Luis Fernando Alberto, Rodrigo Ramos, Alexandre Delbem  
*Universidade de São Paulo, Brazil*
- A3L-B.2 Practical Stability Assesment of Distributed Synchronous Generators Under Load Variations .....457**  
Roman Kuiava<sup>2</sup>, Rodrigo Ramos<sup>1</sup>, Luis Fernando Alberto<sup>1</sup>, Hemanshu Pota<sup>3</sup>  
<sup>1</sup>*Universidade de São Paulo, Brazil*; <sup>2</sup>*Universidade Federal do Paraná, Brazil*;  
<sup>3</sup>*University of New South Wales, Australia*
- A3L-B.3 Saddle-Node Bifurcation in Three-Phase Unbalanced Distribution Networks with Distributed Generators .....461**  
Yan-Feng Jiang<sup>2</sup>, Hsiao-Dong Chiang<sup>1</sup>  
<sup>1</sup>*Cornell University, United States*; <sup>2</sup>*Tianjin University, China*
- A3L-B.4 BCS: a Binary Cuckoo Search Algorithm for Feature Selection.....465**  
Douglas Rodrigues<sup>3</sup>, Luis Pereira<sup>3</sup>, Thiago Almeida<sup>3</sup>, Joao Paulo Papa<sup>3</sup>, Andre Souza<sup>3</sup>, Caio Ramos<sup>2</sup>, Xin-She Yang<sup>1</sup>  
<sup>1</sup>*Middlesex University, United Kingdom*; <sup>2</sup>*Universidade de São Paulo, Brazil*;  
<sup>3</sup>*Universidade Estadual Paulista, Brazil*
- A3L-B.5 A Set of Independent Admittance Bases for Decoupled Analysis of Unbalanced Three-Phase Systems .....469**  
Zhen Li, Siu-Chung Wong, Chi Kong Michael Tse  
*Hong Kong Polytechnic University, Hong Kong*

**A3L-C: Rate-Distortion Optimized Video Coding**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 302A

Chairs: Homer H. Chen, *National Taiwan University*  
Lu Yu, *Zhejiang University*

---

- A3L-C.1 Acceleration of Rate-Distortion Optimized Quantization for H.264/AVC .....473**  
Tsung-Yau Huang, Chieh-Kai Kao, Homer H. Chen  
*National Taiwan University, Taiwan*
- A3L-C.2 QP Refinement According to Lagrange Multiplier for High Efficiency Video Coding .....477**  
Bin Li<sup>2</sup>, Jizheng Xu<sup>1</sup>, Dong Zhang<sup>2</sup>, Houqiang Li<sup>2</sup>  
<sup>1</sup>*Microsoft Research Asia, China*; <sup>2</sup>*University of Science and Technology of China, China*
- A3L-C.3 Rate-Distortion Optimization with Adaptive Weighted Distortion in High Efficiency Video Coding .....481**  
Bin Li<sup>2</sup>, Jizheng Xu<sup>1</sup>, Houqiang Li<sup>2</sup>  
<sup>1</sup>*Microsoft Research Asia, China*; <sup>2</sup>*University of Science and Technology of China, China*
- A3L-C.4 Low-Complexity Content-Adaptive Lagrange Multiplier Decision for SSIM-Based RD-Optimized Video Coding .....485**  
Pinghua Zhao<sup>1</sup>, Yanwei Liu<sup>1</sup>, Jinxia Liu<sup>2</sup>, Ruixiao Yao<sup>1</sup>, Song Ci<sup>1</sup>, Hui Tang<sup>1</sup>  
<sup>1</sup>*Institute of Acoustics, Chinese Academy of Sciences, China*; <sup>2</sup>*Zhejiang Wanli University, China*
- A3L-C.5 Perceptual Rate Distortion Optimization for Block Mode Selection in Hybrid Video Coding .....489**  
Chen-Chou Huang, Hsu-Feng Hsiao  
*National Chiao Tung University, Taiwan*

**A3L-D: Circuits and Systems for Communication II**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 302B

Chair: Zhongfeng Wang, *Broadcom Corp.*

---

- A3L-D.1 Optimizations for an Efficient Reconfiguration of an ASIP-Based Turbo Decoder .....493**  
Vianney Lapotre<sup>3</sup>, Purushotham Murugappa<sup>2</sup>, Guy Gogniat<sup>3</sup>, Amer Baghdadi<sup>2</sup>,  
Jean-Philippe Diguët<sup>3</sup>, Jean-Noel Bazin<sup>2</sup>, Michael Hübner<sup>1</sup>  
*<sup>1</sup>Ruhr-Universität Bochum, Germany; <sup>2</sup>Télécom Bretagne, France; <sup>3</sup>Université de  
Bretagne Sud, France*
- A3L-D.2 CMOS Receiver with Equalizer and CDR for Short-Reach Optical  
Communications .....497**  
Carlos Sánchez-Azqueta, Cecilia Gimeno, Concepcion Aldea, Santiago Celma,  
Cristina Azcona  
*Universidad de Zaragoza, Spain*
- A3L-D.3 A Highly-Efficient Multi-Band Multi-Mode Digital Quadrature Transmitter with 2D  
Pre-Distortion .....501**  
Hua Wang<sup>2</sup>, C.-H. Peng<sup>1</sup>, Chao Lu<sup>2</sup>, Yaopei Chang<sup>2</sup>, Richard Huang<sup>2</sup>, Andy  
Chang<sup>1</sup>, Genie Shih<sup>1</sup>, Ray Hsu<sup>1</sup>, Paul C. P. Liang<sup>1</sup>, Sangwon Son<sup>2</sup>, Ali Niknejad<sup>3</sup>,  
George Chien<sup>1</sup>, CL Tsai<sup>1</sup>, HC Hwang<sup>1</sup>  
*<sup>1</sup>MediaTek Inc., Taiwan; <sup>2</sup>MediaTek USA Inc., United States; <sup>3</sup>University of  
California, Berkeley, United States*
- A3L-D.4 A High Throughput ASIC Design for IPv6 Routing Lookup System.....505**  
Yi-Mao Hsiao, Yuan-Sun Chu, Chao-Yang Chang, Chung-Hsun Huang, Hsi-Hsun  
Yeh  
*National Chung Cheng University, Taiwan*
- A3L-D.5 A 5.8GHz Integrated CMOS Transmitter for Chinese Electronic Toll Collection  
System.....509**  
Jian Shi<sup>1</sup>, Shimao Xiao<sup>1</sup>, Yunfeng Yu<sup>1</sup>, Wei Huang<sup>1</sup>, Wenguang Pan<sup>1</sup>, Tianchun  
Ye<sup>1</sup>, Min Qian<sup>2</sup>, Xiaofeng He<sup>2</sup>, Chengyan Ma<sup>2</sup>  
*<sup>1</sup>Institute of Microelectronics of Chinese Academy of Sciences, China; <sup>2</sup>Jiaxing  
Lianxing Microelectronics Co., Ltd., China*

**A3L-E: Adaptive Signal Processing**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 303A

Chairs: H. K. Kwan, *University of Windsor*  
Takao Hinamoto, *Hiroshima University*

---

- A3L-E.1 Thresholding-Based Online Algorithms of Complexity Comparable to Sparse LMS Methods .....513**  
Yannis Kopsinis<sup>3</sup>, Konstantinos Slavakis<sup>4</sup>, Sergios Theodoridis<sup>2</sup>, Stephen McLaughlin<sup>1</sup>  
*<sup>1</sup>Heriot Watt University, United Kingdom; <sup>2</sup>University of Athens, Greece; <sup>3</sup>University of Granada, Spain; <sup>4</sup>University of Minnesota, United States*
- A3L-E.2 New Constrained Affine-Projection Adaptive-Filtering Algorithm.....517**  
Md. Zulfiqar Ali Bhotto, Andreas Antoniou  
*University of Victoria, Canada*
- A3L-E.3 New Proportionate Affine Projection Sign Algorithms .....521**  
Felix Albu<sup>2</sup>, Hon Keung Kwan<sup>1</sup>  
*<sup>1</sup>University of Windsor, Canada; <sup>2</sup>Valahia University of Targoviste, Romania*
- A3L-E.4 Special Properties of the Modified DFT to Achieve Algorithmic Fault Tolerance in Adaptive Filters .....525**  
William Jenkins<sup>2</sup>, Chandrashekar Radhakrishnan<sup>3</sup>, Danielle Sova<sup>1</sup>  
*<sup>1</sup>George Mason University, United States; <sup>2</sup>Pennsylvania State University, United States; <sup>3</sup>University of Illinois, United States*
- A3L-E.5 Acoustic Feedback Neutralization in Digital Hearing Aids - a Two Adaptive Filters-Based Solution .....529**  
Muhammad Akhtar<sup>2</sup>, Akinori Nishihara<sup>1</sup>  
*<sup>1</sup>Tokyo Institute of Technology, Japan; <sup>2</sup>University of Electro-Communications, Japan*

**A3L-F: SPECIAL SESSION: 3D IC Platform for Heterogeneous System-on-Chip Integration**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 303B

Chairs: Hao Yu, *Nanyang Technological University*  
Chip Hong Chang, *Nanyang Technological University*

---

- A3L-F.1 Cyber-Physical Management for Heterogeneously Integrated 3D Thousand-Core on-Chip Microprocessor.....533**  
Sai Manoj P D, Hao Yu  
*Nanyang Technological University, Singapore*
- A3L-F.2 3D Stacking for Multi-Core Architectures: from WIDEIO to Distributed Caches.....537**  
Fabien Clermidy, Denis Dutoit, Eric Guthmuller, Ivan Miro-Panades, Pascal Vivet  
*CEA LETI, France*
- A3L-F.3 Impact of Manufacturing Process Variations on Performance and Thermal Characteristics of 3D ICs: Emerging Challenges and New Solutions.....541**  
Da-Cheng Juan<sup>1</sup>, Siddharth Garg<sup>2</sup>, Diana Marculescu<sup>1</sup>  
<sup>1</sup>*Carnegie Mellon University, United States*; <sup>2</sup>*University of Waterloo, Canada*
- A3L-F.4 Exploring Early Design Tradeoffs in 3DIC .....545**  
Paul Franzon<sup>1</sup>, Shivam Priyadarshi<sup>1</sup>, Steve Lipa<sup>1</sup>, Rhett Davis<sup>1</sup>, Thor Thorolfsson<sup>2</sup>  
<sup>1</sup>*North Carolina State University, United States*; <sup>2</sup>*Synopsys, Inc., United States*
- A3L-F.5 An Inductive-Coupling Interconnected Application-Specific 3D NoC Design.....550**  
Zhen Zhang, Shouyi Yin, Leibo Liu, Shaojun Wei  
*Tsinghua University, China*

**A3L-G: Low-Power Logic & Architectures II**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 305

Chairs: Xinmiao Zhang, *Case Western Reserve University*  
Vasily Moshnyaga, *Fukuoka University*

---

- A3L-G.1 FDSOI Versus Bulk CMOS at 28 nm Node - Which Technology for Ultra-Low Power Design? .....554**  
Jani Mäkipää<sup>2</sup>, Olivier Billoint<sup>1</sup>  
<sup>1</sup>CEA LETI, France; <sup>2</sup>VTT Technical Research Centre of Finland, Finland
- A3L-G.3 A Process-Variation Compensation Scheme to Operate CMOS Digital Logic Cells in Deep Sub-Threshold Region at 80mV .....562**  
Robert Kappel<sup>1</sup>, Mario Auer<sup>1</sup>, Wolfgang Pribyl<sup>1</sup>, Günter Hofer<sup>2</sup>, Gerald Holweg<sup>2</sup>  
<sup>1</sup>Graz University of Technology, Austria; <sup>2</sup>Infineon Technologies Austria AG, Austria
- A3L-G.4 Ultra Low Power NEMFET Based Logic .....566**  
Marius Enachescu<sup>1</sup>, Mihai Lefter<sup>1</sup>, Antonios Bazigos<sup>2</sup>, Adrian M. Ionescu<sup>2</sup>, Sorin Dan Cotofana<sup>1</sup>  
<sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>École Polytechnique Fédérale de Lausanne, Switzerland
- A3L-G.5 Minimum Energy Point Tracking for Sub-Threshold Digital CMOS Circuits Using an in-situ Energy Sensor .....570**  
Nandish Mehta, Kofi Makinwa  
Delft University of Technology, Netherlands

**A3L-H: Data Convertors II**

Time: Monday, May 20, 2013, 15:30 - 17:00  
Room: Room 306A  
Chairs: Degang J Chen, *Iowa State University*  
Mohamad Sawan, *Polytechnique Montreal*

---

|                |  |            |
|----------------|--|------------|
| <b>A3L-H.1</b> | <b>A DAC Cell with Improved ISI and Noise Performance Using Native Switching for Multi-bit CT Delta Sigma Modulators.....</b>          | <b>574</b> |
|                | John G. Kauffman, Rudolf Ritter, Chao Chu, Maurits Ortmanns<br><i>Universität Ulm, Germany</i>   |            |
| <b>A3L-H.2</b> | <b>Modeling and Analysis of Aliasing Image Spurs Problem in Digital-RF-Converter-Based IQ Modulators .....</b>                         | <b>578</b> |
|                | Reza Sadeghifar, Jacob Wikner<br><i>Linköping University, Sweden</i>   |            |
| <b>A3L-H.3</b> | <b>Background Adaptive Linearization of High-Speed Digital-to-Analog Converters .....</b>  | <b>582</b> |
|                | Andrea Fenaroli, Salvatore Levantino, Carlo Samori, Andrea Lacaita<br><i>Politecnico di Milano, Italy</i>                              |            |
| <b>A3L-H.4</b> | <b>A Low Power 1-MHz Continuous-Time Sigma-Delta Modulator Using a Passive Loop Filter Designed with a Genetic Algorithm Tool.....</b> | <b>586</b> |
|                | João Luís Alvernaz de Melo<br><i>UNINOVA/CTS - Universidade Nova de Lisboa, Portugal</i>   |            |
| <b>A3L-H.5</b> | <b>A Distortion Corrected Passive RC Noise Shaping ADC for Biomedical Applications .....</b>   | <b>590</b> |
|                | Luis Hernandez, Enrique Prefasi, Susana Paton<br><i>Universidad Carlos III de Madrid, Spain</i>  |            |



**A3L-J: Amplifiers II**

Time: Monday, May 20, 2013, 15:30 - 17:00  
Room: Room 306B  
Chairs: Robert Sobot, *University of West Ontario*  
Igor Filanovsky, *University of Alberta*

---

|                |  |            |
|----------------|--|------------|
| <b>A3L-J.1</b> | <b>A Switched Gain Cell Parametric Amplifier .....</b>   | <b>594</b> |
|                | Chutham Sawigun, Amorn Jiraseree-Amornkun<br><i>Mahanakorn University of Technology, Thailand</i>  |            |
| <b>A3L-J.2</b> | <b>A Design Methodology to Achieve Low Input Impedance and Non-Constant Gain-Bandwidth Product in TIAs for Optical Communication .....</b>   | <b>598</b> |
|                | Seungwoo Jung <sup>1</sup> , John Cressler <sup>1</sup> , Jeff Babcock <sup>2</sup> , Greg Cestra <sup>2</sup> , Alan Buchholz <sup>2</sup><br><sup>1</sup> <i>Georgia Institute of Technology, United States</i> ; <sup>2</sup> <i>Texas Instruments, United States</i> |            |
| <b>A3L-J.3</b> | <b>A 94% Efficiency Near-Constant Frequency Self-Oscillating Class-D Audio Amplifier with Voltage Control Resistor .....</b>   | <b>602</b> |
|                | Shao Siang Ng <sup>1</sup> , Kuei-Liang Lin <sup>1</sup> , Ke-Horng Chen <sup>1</sup> , Yu-Wen Chen <sup>2</sup><br><sup>1</sup> <i>National Chiao Tung University, Taiwan</i> ; <sup>2</sup> <i>Vanguard International Semiconductor Corp., Taiwan</i>                  |            |
| <b>A3L-J.4</b> | <b>A Fully Differential CMOS Self-Biased Two-Stage Preampfier-Latch Threshold Detection Comparator.....</b>  | <b>606</b> |
|                | Vladimir Milovanovic, Horst Zimmermann<br><i>Technische Universität Wien, Austria</i>  |            |
| <b>A3L-J.5</b> | <b>RF Current Mode Class-D Power Amplifiers Under Periodic and Non-Periodic Switching Conditions.....</b>  | <b>610</b> |
|                | Sadegh Abbasian, Thomas Johnson<br><i>University of British Columbia, Canada</i>   |            |

**A3L-K: Circuits for Implants**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 307A

Chairs: Timothy Constandinou, *Imperial College London*  
Xiao Liu, *Brunel University*

---

- A3L-K.1 Control Methodology for on-Chip Switching Power Supplies for Biomedical Implants.....614**  
Mohammad Abu Khater, Serkan Sayilir, Byunghoo Jung  
*Purdue University, United States*
- A3L-K.2 A 2-MHz, Process and Voltage Compensated Clock Oscillator for Biomedical Implantable SoC in 0.18- $\mu$ m CMOS.....618**  
Hansraj Bhamra, Pedro Irazoqui  
*Purdue University, United States*
- A3L-K.3 A 281-nW 43.3 fJ/Conversion-Step 8-ENOB 25-kS/s Asynchronous SAR ADC in 65nm CMOS for Biomedical Applications.....622**  
Chao Yuan, Yvonne Lam  
*Nanyang Technological University, Singapore*
- A3L-K.4 A Low Power BPSK Demodulator for Wireless Implantable Biomedical Devices .....626**  
Benjamin Wilkerson, Jin-Ku Kang  
*Inha University, Korea, South*
- A3L-K.5 Wireless Power Transfer H-Bridge Design with Serial Resonance and Varying Supply Voltage .....630**  
Sebastian Rickers, Mohammad Elikae, Zijian Bai, Christian Kocks, Guido H. Bruck, Peter Jung  
*Universität Duisburg-Essen, Germany*

**A3L-L: SPECIAL SESSION: Novel Circuits & Systems for Visual Prostheses**

Time: Monday, May 20, 2013, 15:30 - 17:00

Room: Room 307B

Chairs: Kea-Tiong Tang, *National Tsing Hua University*  
Guoxing Wang, *Shanghai Jiao Tong University*

---

- A3L-L.1 Challenges in Circuits for Visual Prostheses ..... 634**  
Jyun-Ting Chen<sup>1</sup>, Kea-Tiong Tang<sup>1</sup>, Guoxing Wang<sup>2</sup>  
*<sup>1</sup>National Tsing Hua University, Taiwan; <sup>2</sup>Shanghai Jiao Tong University, China*
- A3L-L.2 A Multi-Channel Neural Stimulator with Resonance Compensated Inductive Receiver and Closed-Loop Smart Power Management ..... 638**  
Hongcheng Xu, Ulrich Bihr, Joachim Becker, Maurits Ortmanns  
*Universität Ulm, Germany*
- A3L-L.3 A CMOS Microchip-Based Retinal Prosthetic Device for Large Numbers of Stimulation in Wide Area ..... 642**  
Jun Ohta<sup>1</sup>, Toshihiko Noda<sup>1</sup>, Kiyotaka Sasagawa<sup>1</sup>, Takashi Tokuda<sup>1</sup>, Yasuo Terasawa<sup>2</sup>, Hironari Kanda<sup>3</sup>, Takashi Fujikado<sup>3</sup>  
*<sup>1</sup>Nara Institute of Science and Technology, Japan; <sup>2</sup>Nidek, Japan; <sup>3</sup>Osaka University, Japan*
- A3L-L.4 Capacitive-Data Links, Energy-Efficient and High-Voltage Compliant Visual Intracortical Microstimulation System ..... 646**  
Md. Hasanuzzaman<sup>2</sup>, Guillaume Simard<sup>2</sup>, Nedialko Krouchev<sup>2</sup>, Rabin Raut<sup>1</sup>, Mohamad Sawan<sup>2</sup>  
*<sup>1</sup>Concordia University, Canada; <sup>2</sup>École Polytechnique de Montréal, Canada*

**A4P-N: Live Demonstrations of Circuits and Systems I**

Time: Monday, May 20, 2013, 13:40 - 17:00

Room: Poster Area

Chairs: Oscar Au, *Hong Kong University of Science & Technology*  
Anthony Vetro, *Mitsubishi Electric Research Labs*

---

- A4P-N.1 Quality Control of Real-Time Panoramic Views from the Smart Camera 360SCAN ....650**  
Roman Graf, Ahmed Nabil Belbachir, Ross King, Manfred Mayerhofer  
*Austrian Institute of Technology, Austria*
- A4P-N.2 TURNUS: a Design Exploration Framework for Dataflow System Design.....654**  
Simone Casale Brunet<sup>1</sup>, Marco Mattavelli<sup>1</sup>, Jorn Janneck<sup>2</sup>  
<sup>1</sup>*École Polytechnique Fédérale de Lausanne, Switzerland*; <sup>2</sup>*Lund University, Sweden*
- A4P-N.3 A Low-Cost Scalable Voltage-Frequency Adjustor for Implementing Low-Power Systems.....655**  
Ching-Hwa Cheng<sup>1</sup>, Sheng-Wei Hsu<sup>1</sup>, Jiun-In Guo<sup>2</sup>  
<sup>1</sup>*Feng-Chia University, Taiwan*; <sup>2</sup>*National Chiao Tung University, Taiwan*
- A4P-N.4 Live Demonstration: Real-Time Audio Restoration Using Sparse Signal Recovery ....659**  
David Bellasi<sup>2</sup>, Patrick Maechler<sup>2</sup>, Andreas Burg<sup>1</sup>, Norbert Felber<sup>2</sup>, Hubert  
Kaeslin<sup>2</sup>, Christoph Studer<sup>3</sup>  
<sup>1</sup>*École Polytechnique Fédérale de Lausanne, Switzerland*; <sup>2</sup>*ETH Zürich, Switzerland*;  
<sup>3</sup>*Rice University, United States*
- A4P-N.5 Live Demonstration: High Level Software and Hardware Synthesis of Dataflow Programs.....660**  
Endri Bezati, Ghislain Roquier, Marco Mattavelli  
*École Polytechnique Fédérale de Lausanne, Switzerland*

**A4P-P: Live Demonstrations of Circuits and Systems II**

Time: Monday, May 20, 2013, 13:40 - 17:00

Room: Poster Area

Chairs: Oscar Au, *Hong Kong University of Science & Technology*

Anthony Vetro, *Mitsubishi Electric Research Labs*

---

- A4P-P.1 Live Demonstration: Axon Emulator for Evaluation of Nerve Recording Systems .....661**  
Sheng-Chih Chuang, Wan-Ting Lin, Robert Rieger  
*National Sun Yat-Sen University, Taiwan*
- A4P-P.2 Unipolar ECG Circuits: Towards More Precise Cardiac Event Identification .....662**  
Gaetano Gargiulo<sup>2</sup>, Jonathan Tapon<sup>2</sup>, André van Schaik<sup>2</sup>, Alistair McEwan<sup>1</sup>,  
Aravinda Thiagalingam<sup>1</sup>  
<sup>1</sup>*University of Sydney, Australia*; <sup>2</sup>*University of Western Sydney, Australia*
- A4P-P.3 Live Demonstration: Multiple-Timescale Plasticity in a Neuromorphic System .....666**  
Christian Mayr, Johannes Partzsch, Marko Noack, Rene Schüffny  
*Technische Universität Dresden, Germany*
- A4P-P.4 Live Demonstration: a High-Speed-Pass Asynchronous Motion Detection Sensor.....671**  
Xiangyu Zhang, Shoushun Chen  
*Nanyang Technological University, Singapore*
- A4P-P.5 Live Demonstration:A Wireless Force Measurement System for Total Knee Arthroplasty .....672**  
Hong Chen, Chun Zhang, Zhihua Wang  
*Tsinghua University, China*

**B1L-A: Multimedia Architecture**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 301A

Chairs: Oscar Au, *Hong Kong University of Science & Technology*  
Tian-Sheuan Chang, *National Chiao-Tung University*

---

- B1L-A.1 A High-Throughput VLSI Architecture for Deblocking Filter in HEVC .....673**  
Weiwei Shen, Qing Shang, Sha Shen, Yibo Fan, Xiaoyang Zeng  
*Fudan University, China*
- B1L-A.2 Fully Pipelined DCT/IDCT/Hadamard Unified Transform Architecture for HEVC  
Codec .....677**  
Jia Zhu, Zhenyu Liu, Dongsheng Wang  
*Tsinghua University, China*
- B1L-A.3 A Custom GZIP Decoder for DTV Application .....681**  
Ke Zhu<sup>2</sup>, WeiDong Liu<sup>2</sup>, Jiang Du<sup>1</sup>  
<sup>1</sup>*Chengdu University of Information Technology, China;* <sup>2</sup>*Hisense Co. Ltd., China*
- B1L-A.4 Memory-Efficient Scalable Video Encoder Architecture for Multi-Source Digital  
Home Environment .....685**  
Tsung-Han Tsai, Zong-Hong Li, Hsueh-Yi Lin, Li-Yang Huang  
*National Central University, Taiwan*
- B1L-A.5 A 34.1fps Scale-Space Processor with Two-Dimensional Cache for Real-Time  
Object Recognition .....689**  
Youchang Kim, Junyoung Park, Hoi-Jun Yoo  
*Korea Advanced Institute of Science and Technology, Korea, South*

**B1L-B: Integrated Power Circuits and Charge Pumps**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 301B

Chairs: Tsorng-Juu Liang, *National Cheng-Kung University*  
Wing Hung Ki, *The Hong Kong Univ. of Science & Technology*

---

- B1L-B.1 High-Side NMOS Power Switch and Bootstrap Driver for High-Frequency Fully-Integrated Converters with Enhanced Efficiency.....693**  
Cheng Huang, Lin Cheng, Philip K.T. Mok, Wing-Hung Ki  
*Hong Kong University of Science and Technology, Hong Kong*
- B1L-B.2 Analysis and Design of Three-State Controlled Transition Mode for a Buck-Boost Converter with Efficiency and Stability Enhancement .....697**  
Xiaohao Hu, Philip K.T. Mok  
*Hong Kong University of Science and Technology, Hong Kong*
- B1L-B.3 A Series of Exponential Step-Down Switched-Capacitor Converters and Their Applications in Two-Stage Converters .....701**  
Song Xiong<sup>1</sup>, Siu-Chung Wong<sup>1</sup>, Siew-Chong Tan<sup>2</sup>  
<sup>1</sup>*Hong Kong Polytechnic University, Hong Kong;* <sup>2</sup>*University of Hong Kong, Hong Kong*
- B1L-B.4 Design of Reliable 2×VDD and 3×VDD Series-Parallel Charge Pumps in Nanoscale CMOS.....705**  
Yongtao Geng, Dongsheng Ma  
*University of Texas at Dallas, United States*
- B1L-B.5 A Fully Integrated Switched-Capacitor Based PMU with Adaptive Energy Harvesting Technique for Ultra-Low Power Sensing Applications .....709**  
Suyoung Bang, Yoonmyung Lee, Inhee Lee, Yejoong Kim, Gyouho Kim, David Blaauw, Dennis Sylvester  
*University of Michigan, United States*

**B1L-C: Visual Signal Processing and Analysis**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 302A

Chairs: King Ngai Ngan, *Chinese University of Hong Kong, China*  
Daniel P.K. Lun, *Hong Kong Polytechnic University, China*

---

- B1L-C.1 A New Multi-View Articulated Human Motion Tracking Algorithm with Improved Silhouette Extraction and View Adaptive Fusion .....713**  
Zhong Liu<sup>1</sup>, King-To Ng<sup>1</sup>, Shing-Chow Chan<sup>1</sup>, Xiao-Wei Song<sup>2</sup>  
<sup>1</sup>University of Hong Kong, Hong Kong; <sup>2</sup>Zhongyuan University of Technology, China
- B1L-C.2 Object Segmentation from Wide Baseline Video .....717**  
Chunhui Cui<sup>1</sup>, Qian Zhang<sup>2</sup>, King Ngai Ngan<sup>2</sup>  
<sup>1</sup>Applied Science and Technology Research Institute, China; <sup>2</sup>Chinese University of Hong Kong, China
- B1L-C.3 LSGP: Line-SIFT Geometric Pattern for Wide-Baseline Image Matching .....721**  
Heng Liu, Xuejin Chen, Jiawei Zhang, Zhefu Tu  
*University of Science and Technology of China, China*
- B1L-C.4 A New Finger Touch Detection Algorithm and Prototype System Architecture for Pervasive Bare-Hand Human Computer Interaction .....725**  
Zhong Lv, Yi Xu, Guolin Li, Xiang Xie, Jun Hu, Wei Song, Zhihua Wang  
*Tsinghua University, China*
- B1L-C.5 Image Enhancement for Fringe Projection Profilometry .....729**  
William Ng, Daniel Lun  
*Hong Kong Polytechnic Univeristy, Hong Kong*



**B1L-D: Wireless Communication Circuits**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 302B

Chair: Hassan Aboushady, *University of Pierre & Marie Curie*

---

- B1L-D.1 A 65nm CMOS Wide-Band LNA with Continuously Tunable Gain from 0dB to 24dB.....733**  
Johannes Sturm<sup>1</sup>, Xinbo Xiang<sup>1</sup>, Harald Pretl<sup>2</sup>  
<sup>1</sup>*Carinthia University of Applied Sciences, Austria*; <sup>2</sup>*Danube Mobile Communications Engineering, Austria*
- B1L-D.2 Low Power, High Linearity Multi-Mode Downconversion Mixer for SDR.....737**  
Yexin Chen, Na Yan, Jianfei Xu, Qiang Chen, Jie Sun  
*Fudan University, China*
- B1L-D.3 Multi-Band Wide Tuning Range CMOS VCO with Hybrid Inductor for LTE Standard.....741**  
Seonghan Ryu<sup>1</sup>, In-Chul Hwang<sup>3</sup>, Ara Cho<sup>3</sup>, Sangyub Lee<sup>2</sup>  
<sup>1</sup>*Hannam University, Korea, South*; <sup>2</sup>*I&C Technology, Inc., Korea, South*; <sup>3</sup>*Kangwon National University, Korea, South*
- B1L-D.4 An Adaptive Class-E Power Amplifier with Improvement in Efficiency, Reliability and Process Variation Tolerance.....745**  
Aritra Banerjee, Abhijit Chatterjee  
*Georgia Institute of Technology, United States*
- B1L-D.5 SAW-Less GNSS Front-End Amplifier with 80.4-dB GSM Blocker Suppression Using CMOS Directional Coupler Notch Filter.....749**  
Yongan Zheng, Le Ye, Long Chen, Huailin Liao, Ru Huang  
*Peking University, China*

**B1L-E: Image Enhancement and Interpolation**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 303A

Chair: Kai-Kuang Ma, *Nanyang Technological University*

---

- B1L-E.1 Single Underwater Image Enhancement with a New Optical Model.....753**  
Haocheng Wen, Yonghong Tian, Tiejun Huang, Wen Gao  
*Peking University, China*
- B1L-E.2 Image Enlargement Using the Giga-Vision Sensor Model .....757**  
Guang Deng  
*La Trobe University, Australia*
- B1L-E.4 Fuzzy Logic and Additive Wavelet Based Image Fusion.....761**  
Syed Sohaib Ali, Muhammad Mohsin Riaz, Abdul Ghafoor  
*National University of Sciences and Technology, Pakistan*
- B1L-E.5 Hybrid Image Interpolation with Soft-Decision Kernel Regression.....765**  
Jing Liu, Xiaokang Yang, Guangtao Zhai, Li Chen  
*Shanghai Jiao Tong University, China*

**B1L-F: Digital VLSI Circuits**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 303B

Chairs: Volkan Kursun, *The Hong Kong University of Science and Technology*  
Gaetano Palumbo, *Universita' di Catania*

---

- B1L-F.1 Scan-Controlled Pulse Flip-Flops for Mobile Application Processors.....769**  
Min-Su Kim, Hyoungwook Lee, Jin-Soo Park, Chunghee Kim, Juhyun Kang, Ken Shin, Emil Kagramanyan, Gunok Jung, Ukrae Cho, Youngmin Shin, Jae Cheol Son  
*Samsung Electronics, Korea, South*
- B1L-F.2 Efficient In Situ Error Detection Enabling Diverse Path Coverage.....773**  
Chia-Hsiang Chen, Yaoyu Tao, Zhengya Zhang  
*University of Michigan, United States*
- B1L-F.3 Implementation of Hybrid Version Management in Hardware Transactional Memory.....777**  
Lihang Zhao, Jeff Draper  
*Information Sciences Institute / University of Southern California, United States*
- B1L-F.4 Redefining the Relationship Between Scalar and Parallel Units in SIMD Architectures .....781**  
Yaohua Wang, Shuming Chen, Jianghua Wan, Kai Zhang  
*National University of Defense Technology, China*
- B1L-F.5 Collaborative Error Control Method for Sequential Logic Circuits .....785**  
Qiaoyan Yu, Drew Stock  
*University of New Hampshire, United States*

**B1L-G: Cross-Disciplinary Applications I**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 305

Chairs: Zhengya Zhang, *University of Michigan*  
Masud Chowdhury, *University of Missouri-Kansas City*

---

- B1L-G.1 Logic-on-Logic Partitioning Techniques for 3-Dimensional Integrated Circuits .....789**  
Gopi Neela, Jeff Draper  
*Information Sciences Institute / University of Southern California, United States*
- B1L-G.2 A SC/HSI Dual-Mode Baseband Receiver with Frequency-Domain Equalizer for IEEE 802.15.3c .....793**  
Wei-Chang Liu, Fu-Chun Yeh, Ting-Chen Wei, Ya-Shiue Huang, Tai-Yang Liu, Shen-Jui Huang, Ching-Da Chan, Shyh-Jye Jou, Sau-Gee Chen  
*National Chiao Tung University, Taiwan*
- B1L-G.3 An Efficient VLSI Architecture of QPP Interleaver/Deinterleaver for LTE Turbo Coding .....797**  
Arash Ardakani, Mojtaba Mahdavi, Mahdi Shabany  
*Sharif University of Technology, Iran*
- B1L-G.4 Microchannel Splitting and Scaling for Thermal Balancing of Liquid-Cooled 3DIC .....801**  
Hanhua Qian, Chip Hong Chang  
*Nanyang Technological University, Singapore*
- B1L-G.5 Modelling NEM Relays for Digital Circuit Applications .....805**  
Sunil Rana<sup>2</sup>, Tyson Tian Qin<sup>2</sup>, Dinesh Pamunuwa<sup>2</sup>, Daniel Grogg<sup>1</sup>, Michel Despont<sup>1</sup>, Yu Pu<sup>1</sup>, Christoph Hagleitner<sup>1</sup>  
<sup>1</sup>*IBM Research - Zurich Laboratory, Switzerland;* <sup>2</sup>*University of Bristol, United Kingdom*

**B1L-H: Sigma-Delta Converters I**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 306A

Chairs: Jose M. de la Rosa, *Instituto de Microelectrónica de Sevilla*  
Luis Hernandez, *University Carlos III de Madrid*

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|                |  |            |
|----------------|--|------------|
| <b>B1L-H.1</b> | <b>A Voltage Scaling 0.25-1.8 V Delta-Sigma Modulator with Inverter-Opamp Self-Configuring Amplifier .....</b>         | <b>809</b> |
|                | Kentaro Yoshioka, Yosuke Toyama, Teruo Jyo, Hiroki Ishikuro<br><i>Keio University, Japan</i>                           |            |
| <b>B1L-H.2</b> | <b>A 1-V 100-dB Dynamic Range 24.4-kHz Bandwidth Delta-Sigma Modulator .....</b>                                       | <b>813</b> |
|                | Chia-Ling Chang, Jieh-Tsorng Wu<br><i>National Chiao Tung University, Taiwan</i>                                       |            |
| <b>B1L-H.3</b> | <b>A Low-Power, Ultra Low-Offset, 16.5-bit, Sigma-Delta ADC for Coulomb Counting and Fuel Gauge Applications .....</b> | <b>817</b> |
|                | Jose Luis Ceballos, Christian Reindl<br><i>Infineon Technologies Austria AG, Austria</i>                               |            |
| <b>B1L-H.4</b> | <b>Design of a Third-Order Sigma-Delta Modulator with Minimum Op-Amps Output Swing .....</b>                           | <b>821</b> |
|                | Oscar Belotti, Edoardo Bonizzoni, Franco Maloberti<br><i>Università degli Studi di Pavia, Italy</i>                    |            |
| <b>B1L-H.5</b> | <b>An Empirical and Statistical Comparison of State-of-the-Art Sigma-Delta Modulators .....</b>                        | <b>825</b> |
|                | José M. de la Rosa<br><i>CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain</i>                           |            |

**B1L-J: Analog Circuit Techniques I**

Time: Tuesday, May 21, 2013, 09:40 - 11:10  
Room: Room 306B  
Chairs: Thierry Taris, *IMS Bordeaux*  
Oliveira, *Tech. University of Lisbon*

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|                |  |            |
|----------------|--|------------|
| <b>B1L-J.1</b> | <b>Mathematical Analysis of Inter-Band Intermodulation for Concurrent Dual-Band Mixers .....</b>   | <b>829</b> |
|                | Yifei Li, Nathan Neihart<br><i>Iowa State University, United States</i>  |            |
| <b>B1L-J.2</b> | <b>Nonlinearity Analysis of R-2R Ladder-Based Current-Steering Digital to Analog Converter .....</b>   | <b>833</b> |
|                | Chun-Chieh Chen, Nan-Ku Lu<br><i>Chung Yuan Christian University, Taiwan</i>   |            |
| <b>B1L-J.3</b> | <b>A Fully Integrated Video Digital-to-Analog Converter with Minimized Gain Error .....</b>  | <b>837</b> |
|                | Tao Zhang, Qiaoyan Yu<br><i>University of New Hampshire, United States</i>   |            |
| <b>B1L-J.4</b> | <b>Two-Stage Charge Sensitive Amplifier with Self-Biased MOS Transistor as Continuous Reset System .....</b>   | <b>841</b> |
|                | Yacong Zhang, Xiaolu Chen, Zhongjian Chen, Wengao Lu<br><i>Peking University, China</i>  |            |
| <b>B1L-J.5</b> | <b>A SiGe 8-Channel Comparator for Application in a Synthetic Aperture Radiometer.....</b>   | <b>845</b> |
|                | Erik Ryman <sup>2</sup> , Stefan Back Andersson <sup>2</sup> , Johan Riesbeck <sup>2</sup> , Slavko Dejanovic <sup>2</sup> , Anders Emrich <sup>2</sup> , Per Larsson-Edefors <sup>1</sup><br><sup>1</sup> <i>Chalmers University of Technology, Sweden</i> ; <sup>2</sup> <i>Omnisys Instruments AB, Sweden</i> |            |

**B1L-K: Biomedical Systems I**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 307A

Chairs: Mohamad Sawan, *Polytechnique Montreal*  
Julio Georgiou, *University of Cyprus*

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|                |  |            |
|----------------|--|------------|
| <b>B1L-K.1</b> | <b>A 1.52 <math>\mu</math>J/Classification Patient-Specific Seizure Classification Processor Using Linear SVM .....</b>                              | <b>849</b> |
|                | Muhammad Awais Bin Altaf, Jerald Yoo<br><i>Masdar Institute of Science and Technology, U.A.E.</i>  |            |
| <b>B1L-K.2</b> | <b>Similarity-Index Early Seizure Detector VLSI Architecture .....</b>   | <b>853</b> |
|                | Amogh Vidwans, Karim Abdelhalim, Roman Genov<br><i>University of Toronto, Canada</i>   |            |
| <b>B1L-K.3</b> | <b>Low-Power Multi-Processor System Architecture Design for Universal Biomedical Signal Processing .....</b>   | <b>857</b> |
|                | Li-Fang Cheng, Tung-Chien Chen, Liang-Gee Chen<br><i>National Taiwan University, Taiwan</i>  |            |
| <b>B1L-K.4</b> | <b>Reconfigurable Biological Signal Co-Processor for Feature Extraction Dedicated to Implantable Biomedical Microsystems .....</b>                   | <b>861</b> |
|                | Sedigheh Razmpour, Amir Masoud Sodagar, Milad Faizollah, Mohammad Yousef Darmani, Morteza Nourian<br><i>K.N.Toosi University of Technology, Iran</i> |            |
| <b>B1L-K.5</b> | <b>System Level Model for Transcutaneous Optical Telemetric Link .....</b>   | <b>865</b> |
|                | Tianyi Liu, Jens Anders, Maurits Ortmanns<br><i>Universität Ulm, Germany</i>   |            |

**B1L-L: SPECIAL SESSION: Mobile Media Communication & Processing**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Room 307B

Chairs: Junsong Yuan, *Nanyang Technological University*  
Lingyu Duan, *Peking University*

---

- B1L-L.1 Mobile Media Communication, Processing, and Analysis: a Review of Recent Advances .....869**  
Wen Gao<sup>2</sup>, Lingyu Duan<sup>2</sup>, Jun Sun<sup>2</sup>, Junsong Yuan<sup>1</sup>, Yonggang Wen<sup>1</sup>, Yap-Peng Tan<sup>1</sup>, Jianfei Cai<sup>1</sup>, Alex C. Kot<sup>1</sup>  
<sup>1</sup>*Nanyang Technological University, Singapore*; <sup>2</sup>*Peking University, China*
- B1L-L.2 Effective Retargeting for Image Coding .....873**  
Tingxiao Hu, Bo Yan  
*Fudan University, China*
- B1L-L.3 Inter-Screen Interaction for Session Recognition and Transfer Based on Cloud Centric Media Network .....877**  
Yichao Jin, Xiao Liu, Yonggang Wen, Jianfei Cai  
*Nanyang Technological University, Singapore*
- B1L-L.4 Mobile Multimedia Travelogue Generation by Exploring Geo-Locations and Image Tags .....881**  
Shuhui Jiang<sup>2</sup>, Xueming Qian<sup>2</sup>, Ke Lan<sup>2</sup>, Lei Zhang<sup>1</sup>, Tao Mei<sup>1</sup>  
<sup>1</sup>*Microsoft Research Asia, China*; <sup>2</sup>*Xi'an Jiaotong University, China*
- B1L-L.5 Compact Descriptors for Mobile Visual Search and MPEG CDVS Standardization .....885**  
Lingyu Duan, Feng Gao, Jie Chen, Jie Lin, Tiejun Huang  
*Peking University, China*



**B2L-A: Multimedia processing and computing**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 301A

Chairs: Jianfei Cai,  
Weisi Lin, *Nanyang Technological University*

---

- B2L-A.1 Efficient Loop Accelerator for Motion Estimation Specific Instruction-Set Processor .....889**  
Tae Sun Kim<sup>1</sup>, Myung Hoon Sunwoo<sup>1</sup>, Sung Dae Kim<sup>2</sup>  
*<sup>1</sup>Ajou University, Korea, South; <sup>2</sup>Samsung Electronics Co., Korea, South*
- B2L-A.2 Hardware Implementation for Real-Time 3D Rendering in 2D-to-3D Conversion .....893**  
Yeong-Kang Lai, Yu-Chieh Chung, Yu-Fan Lai  
*National Chung Hsing University, Taiwan*
- B2L-A.3 Implementation of Multi-Standard Video Decoding Algorithms on a Coarse-Grained Reconfigurable Multimedia Processor .....897**  
Leibo Liu<sup>3</sup>, Yingjie Chen<sup>3</sup>, Shouyi Yin<sup>3</sup>, Dong Wang<sup>3</sup>, Xing Wang<sup>3</sup>, Shaojun Wei<sup>3</sup>, Li Zhou<sup>1</sup>, Hao Lei<sup>4</sup>, Peng Cao<sup>2</sup>  
*<sup>1</sup>Chinese Academy of Sciences, China; <sup>2</sup>Southeast University, China; <sup>3</sup>Tsinghua University, China; <sup>4</sup>Xi'an Jiaotong University, China*
- B2L-A.4 DRAM Access Reduction in GPUs by Thread-Block Scheduling for Overlapped Data Reuse .....901**  
Seungyeol Lee, Wonyong Sung  
*Seoul National University, Korea, South*
- B2L-A.5 Salient Object Cutout Using Google Images .....905**  
Hongyuan Zhu, Jianfei Cai, Jianmin Zheng, Jianxin Wu, Nadia Thalmann  
*Nanyang Technological University, Singapore*

**B2L-B: Power Converters, Modeling, Dynamics, Control, and Driving I**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 301B

Chairs: Tsorng-Juu Liang, *National Cheng-Kung University*  
Hiroo Sekiya, *Chiba University*

---

- B2L-B.1 94% Performance Improvement by Time-Shift Control (TSC) Technique in Cloud Computing Voltage Regulator Module (VRM).....909**  
Che-Hao Meng, Yi-Ping Su, Yu-Ping Huang, Yu-Huei Lee, Ke-Horng Chen  
*National Chiao Tung University, Taiwan*
- B2L-B.2 Effect of MOSFET Parasitic Capacitances on EER Transmitter with Class-E Amplifier .....913**  
Xiuqin Wei<sup>2</sup>, Tomoharu Nagashima<sup>1</sup>, Hiroo Sekiya<sup>1</sup>, Tadashi Suetsugu<sup>2</sup>  
<sup>1</sup>*Chiba University, Japan*; <sup>2</sup>*Fukuoka University, Japan*
- B2L-B.3 High-PF and Ultra-Low-THD Power Factor Correction Controller by Sinusoidal-Wave Synthesis and Optimized THD Control .....917**  
Chih-Wei Chang<sup>2</sup>, Chia-Lung Ni<sup>2</sup>, Jen-Chieh Tsai<sup>2</sup>, Yi-Ting Chen<sup>2</sup>, Chun-Yen Chen<sup>2</sup>, Ke-Horng Chen<sup>2</sup>, Long-Der Chen<sup>1</sup>, Cheng-Chen Yang<sup>1</sup>  
<sup>1</sup>*Industrial Technology Research Institute, Taiwan*; <sup>2</sup>*National Chiao Tung University, Taiwan*
- B2L-B.4 Switching and Conduction Loss Analysis of Buck Converters Operating in DCM-Only Scenarios .....921**  
Wei Fu<sup>2</sup>, Siang Tan<sup>3</sup>, Ayman Fayed<sup>1</sup>  
<sup>1</sup>*Iowa State University, United States*; <sup>2</sup>*Iowa State University and Texas Instruments Inc., United States*; <sup>3</sup>*Texas Instruments, United States*
- B2L-B.5 Bifurcation Analysis in Dual-Input Buck Converter in Hybrid Power System.....925**  
Xiaoling Xiong<sup>2</sup>, Chi Kong Michael Tse<sup>1</sup>, Xinbo Ruan<sup>2</sup>, Meng Huang<sup>1</sup>  
<sup>1</sup>*Hong Kong Polytechnic University, Hong Kong*; <sup>2</sup>*Nanjing University of Aeronautics and Astronautics, China*

**B2L-C: Visual Analysis and Modeling**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 302A

Chairs: Hongliang Li, *University of Electronic Science and Technology of China*  
Gwo Giun Lee, *National Cheng Kung University*

---

- B2L-C.1 Data-Driven Human Motion Synthesis Based on Angular Momentum Analysis.....929**  
Ping Hu<sup>1</sup>, Qi Sun<sup>2</sup>, Xiangxu Meng<sup>1</sup>, Jingliang Peng<sup>1</sup>  
*<sup>1</sup>Shandong University, China; <sup>2</sup>Taishan College, Shandong University, China*
- B2L-C.2 Visual Masking Estimation Based on Structural Uncertainty .....933**  
Jinjian Wu<sup>2</sup>, Weisi Lin<sup>1</sup>, Guangming Shi<sup>2</sup>  
*<sup>1</sup>Nanyang Technological University, Singapore; <sup>2</sup>Xidian University, China*
- B2L-C.3 Separation of Weak Reflection from a Single Superimposed Image Using Gradient Profile Sharpness .....937**  
Qing Yan, Yi Xu, Xiaokang Yang  
*Shanghai Jiao Tong University, China*
- B2L-C.4 A Visual Attention Model for News Video .....941**  
Bo Wu, Linfeng Xu, Guanghui Liu  
*University of Electronic Science and Technology of China, China*
- B2L-C.5 Saliency Detection Using a Central Stimuli Sensitivity Based Model .....945**  
Linfeng Xu, Hongliang Li, Liaoyuan Zeng, Zhengning Wang, Guanghui Liu  
*University of Electronic Science and Technology of China, China*

**B2L-D: Wireless Communication Systems**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 302B

Chair: Jae Joon Kim, *Ulsan National Institute of Science & Technology*

---

- B2L-D.1 An Energy Efficient Antenna Selection for Large Scale Green MIMO Systems .....950**  
Byung Moo Lee, Jinhyeock Choi, Jongho Bang, Byung-Chang Kang  
*Samsung Electronics / Samsung Advanced Institute of Technolgy, Korea, South*
- B2L-D.2 A Digital Centric Transmitter Architecture with Arbitrary Ratio Baseband-to-LO Upsampling .....954**  
Jan Henning Mueller, Bastian Mohr, Ye Zhang, Renato Negra, Stefan Heinen  
*RWTH Aachen University, Germany*
- B2L-D.3 Reconfigurable Feeding Network for GSM/GPS/3G/WiFi and Global LTE Applications .....958**  
Wei Zhou<sup>2</sup>, Tughrul Arslan<sup>2</sup>, Khaled Benkrid<sup>2</sup>, Ahmed El-Rayis<sup>1</sup>, Nakul Haridas<sup>1</sup>  
<sup>1</sup>*Sofant Technologies, United Kingdom;* <sup>2</sup>*University of Edinburgh, United Kingdom*
- B2L-D.4 A Half Rate CDR with DCD Cleaning Up and Quadrature Clock Calibration for 20Gbps 60GHz Communication in 65nm CMOS .....962**  
Xiaobao Yu<sup>1</sup>, Baoyong Chi<sup>1</sup>, Meng Wei<sup>1</sup>, Albert Wang<sup>2</sup>, Tianling Ren<sup>1</sup>, Zhihua Wang<sup>1</sup>  
<sup>1</sup>*Tsinghua University, China;* <sup>2</sup>*University of California, Riverside, China*
- B2L-D.5 Design of Self-Biased Fully Differential Receiver and Crosstalk Cancellation for Capacitive Coupled Vertical Interconnects in 3DICs .....966**  
Myat Thu Linn Aung<sup>1</sup>, Eric Lim<sup>2</sup>, Takefumi Yoshikawa<sup>2</sup>, Tony Tae Hyoung Kim<sup>1</sup>  
<sup>1</sup>*Nanyang Technological University, Singapore;* <sup>2</sup>*Panasonic, Japan*

**B2L-E: Image Segmentation**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 303A

Chair: Oscar Au, *Hong Kong University of Science & Technology*

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|                |  |            |
|----------------|--|------------|
| <b>B2L-E.1</b> | <b>A Novel Region Merging Based Image Segmentation Approach for Automatic Object Extraction.....</b>                   | <b>970</b> |
|                | Lin Zha, Zhi Liu, Shuhua Luo, Liquan Shen<br><i>Shanghai University, China</i>   |            |
| <b>B2L-E.2</b> | <b>HTS: a New Shape Descriptor Based on Hough Transform.....</b>   | <b>974</b> |
|                | Gustavo Botelho de Souza, Aparecido Nilceu Marana<br><i>Universidade Estadual Paulista, Brazil</i>                     |            |
| <b>B2L-E.3</b> | <b>Gradient Local Binary Patterns for Human Detection .....</b>  | <b>978</b> |
|                | Ning Jiang, Jiu Xu, Wenxin Yu, Satoshi Goto<br><i>Waseda University, Japan</i>   |            |
| <b>B2L-E.4</b> | <b>Segmentation of Low-Altitude Aerial Images of Non-Urban Environment Based on Perceptual Grouping of Edges .....</b> | <b>B#5</b> |
|                | Babak Majidi, Jagdish Patra, Jinchuan Zheng<br><i>Swinburne University of Technology, Australia</i>                    |            |
| <b>B2L-E.5</b> | <b>Segmenting Specific Object Based on Logo Detection.....</b>   | <b>986</b> |
|                | Fanman Meng, Hongliang Li, Guanghui Liu<br><i>University of Electronic Science and Technology of China, China</i>      |            |

**B2L-F: VLSI for Multimedia Processing**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 303B

Chairs: Jun Jin Kong, *Samsung Electronics Company Ltd.*  
Jinsang Kim, *Kyung Hee University*

---

- B2L-F.1 A Novel Implementation Scheme for High Area-Efficient DCT Based on Signed Stochastic Computation .....990**  
Yan Li, Jianhao Hu  
*University of Electronic Science and Technology of China, China*
- B2L-F.2 Optimization of ETSI DSR Frontend Software on a High-Efficient Audio DSP.....994**  
Zhenqi Wei, Peilin Liu, Cun Yu, Hongbin Zhou, Ying Ye, Ji Kong, Rendong Ying  
*Shanghai Jiao Tong University, China*
- B2L-F.3 A High-Throughput Low-Latency Arithmetic Encoder Design for HDTV.....998**  
Yuan Li, Shangang Zhang, Huizhu Jia, Xiaodong Xie, Wen Gao  
*Peking University, China*
- B2L-F.4 A 32.8mW 60fps Cortical Vision Processor for Spatio-Temporal Action Recognition.....1002**  
Seongwook Park, Junyoung Park, Injoon Hong, Hoi-Jun Yoo  
*Korea Advanced Institute of Science and Technology, Korea, South*
- B2L-F.5 A Reconfigurable Inverse Transform Architecture Design for HEVC Decoder .....1006**  
Pai-Tse Chiang, Tian-Sheuan Chang  
*National Chiao Tung University, Taiwan*

**B2L-G: Cross-Disciplinary Applications II**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 305

Chairs: Viktor Öwall, *Lund University*  
Dong Ha, *Virginia Tech Blacksburg*

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- B2L-G.1 Cluster-Based Distributed Active Current Timer for Hardware Trojan Detection .....1010**  
Yuan Cao, Chip Hong Chang, Shoushun Chen  
*Nanyang Technological University, Singapore*
- B2L-G.2 Robust Random Chip ID Generation with Wide-Aperture Clocked Comparators  
and Maximum Likelihood Detection .....1014**  
Yunju Choi, Jaeha Kim  
*Seoul National University, Korea, South*
- B2L-G.3 A Power-Efficient Scan Tree Design by Exploring the Q'-D Connection .....1018**  
Linfeng Chen, Aijiao Cui  
*Harbin Institute of Technology Shenzhen Graduate School, China*
- B2L-G.4 Development of Hybrid Electrical Model for CNT Based Through Silicon Vias .....1022**  
Kaushal Kannan<sup>2</sup>, Sureshwar Kannan<sup>2</sup>, Bruce Kim<sup>2</sup>, Sang-Bock Cho<sup>1</sup>  
<sup>1</sup>*Ulsan University, Korea, South*; <sup>2</sup>*University of Alabama, United States*
- B2L-G.5 Evolution of Graphics Northbridge Debug Bus Architecture Across Four  
Generations of AMD SoCs .....B#5**  
Arie Margulis, David Akselrod, Mike Ricchetti, Eric Rentschler  
*Advanced Micro Devices, United States*

**B2L-H: Sigma-Delta Converters II**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 306A

Chairs: Jose M. de la Rosa, *Instituto de Microelectrónica de Sevilla*  
Luis Hernandez, *University Carlos III de Madrid*

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- B2L-H.1 Concurrent Estimation of Amplifier Nonidealities and Excess Loop Delay in Continuous-Time Sigma-Delta Modulators.....1031**  
Matthias Lorenz, Timon Brückner, Rudolf Ritter, Maurits Ortmanns  
*Universität Ulm, Germany*
- B2L-H.2 Direct Delta-Sigma Receiver: Analysis, Modelization and Simulation .....1035**  
Minh Tien Nguyen<sup>1</sup>, Chadi Jabbour<sup>1</sup>, Cyrius Ouffoue<sup>1</sup>, Rayan Mina<sup>2</sup>, Florent Sibille<sup>2</sup>, Patrick Loumeau<sup>1</sup>, Pascal Triaire<sup>2</sup>, Van Tam Nguyen<sup>1</sup>  
<sup>1</sup>*Institute Mines-Telecom, Telecom ParisTech, France;* <sup>2</sup>*ST-Ericsson SAS, France*
- B2L-H.3 A 1.7mW Quadrature Bandpass Delta Sigma ADC with 1MHz BW and 60dB DR at 1MHz IF .....1039**  
Aytac Atac, Lei Liao, Yifan Wang, Martin Schleyer, Ye Zhang, Ralf Wunderlich, Stefan Heinen  
*RWTH Aachen University, Germany*
- B2L-H.4 A Multi-Stage and Time-Based Continuous Time Sigma-Delta Architecture Using a Gated Ring Oscillator.....1043**  
Juan Antonio Torreño<sup>2</sup>, Susana Paton<sup>2</sup>, Luis Hernandez<sup>2</sup>, Enrique Prefasi<sup>2</sup>, Maria Presicce<sup>1</sup>, Gerhard Paoli<sup>1</sup>  
<sup>1</sup>*Lantiq, Austria;* <sup>2</sup>*Universidad Carlos III de Madrid, Spain*
- B2L-H.5 Approaches to the Implementation of Noise-Coupling in Continuous-Time Delta-Sigma Modulators .....1047**  
Chongjun Ding<sup>1</sup>, Yiannos Manoli<sup>1</sup>, Matthias Keller<sup>2</sup>  
<sup>1</sup>*Albert-Ludwigs-Universität Freiburg, Germany;* <sup>2</sup>*Albert-Ludwigs-Universität Freiburg - IMTEK, Germany*



**B2L-J: Analog Circuit Techniques II**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 306B

Chairs: Thierry Taris, *IMS Bordeaux*  
Baoyong Chi, *Tsinghua University*

---

- B2L-J.1 Analog Signal Processing Solutions for Particle Physics Detectors: Upgrade of the LHCb Calorimeter Electronics .....1051**  
David Gascon Fora<sup>1</sup>, Eduardo Picatoste<sup>1</sup>, Carlos Abellan Beteta<sup>1</sup>, Eugeni Graugés<sup>1</sup>, Lluís Garrido<sup>1</sup>, Xavier Vilasís-Cardona<sup>2</sup>, Frederic Machefer<sup>4</sup>, Olivier Duarte<sup>3</sup>, Jacques Lefrançois<sup>3</sup>  
<sup>1</sup>*ECM and ICC - Universitat de Barcelona, Spain;* <sup>2</sup>*La Salle - Ramon Llull University, Spain;* <sup>3</sup>*LAL - Université de Paris-Sud, France;* <sup>4</sup>*LAL - Université de Paris-Sud, France*
- B2L-J.2 A Compact Analog Active Time Delay Line Using SiGe BiCMOS Technology .....1055**  
Mohamed Hamouda, Georg Fischer, Robert Weigel, Thomas Ussmueller  
*Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany*
- B2L-J.3 Design and Analysis of Full-Chip HV ESD Protection in BCD30V for Mixed-Signal ICs .....1059**  
Shijun Wang<sup>1</sup>, Fei Yao<sup>1</sup>, Li Wang<sup>4</sup>, Rui Ma<sup>4</sup>, Chen Zhang<sup>4</sup>, Zongyu Dong<sup>4</sup>, Albert Wang<sup>5</sup>, Zitao Shi<sup>2</sup>, Yuhua Cheng<sup>2</sup>, Baoyong Chi<sup>3</sup>, Tianling Ren<sup>3</sup>  
<sup>1</sup>*Citruscom Semiconductor, China;* <sup>2</sup>*Peking University, United States;* <sup>3</sup>*Tsinghua University, China;* <sup>4</sup>*University of California, United States;* <sup>5</sup>*University of California, Riverside, United States*
- B2L-J.4 Reliability Degradation with Electrical, Thermal and Thermal Gradient Stress in Interconnects .....1063**  
Srijita Patra, Degang Chen, Randall Geiger  
*Iowa State University, United States*
- B2L-J.5 A Simple Analog CMOS Design Tool Using Transistor Dimension-Independent Parameters .....1067**  
Omar Abdelfattah, Ishiang Shih, Gordon Roberts  
*McGill University, Canada*

**B2L-K: Biomedical Systems II**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Room 307A

Chairs: Tor Sverre Lande, *University of Oslo*

George Yuan, *Hong Kong University of Science & Technology*

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- B2L-K.1**     **A Portable Lab-on-Chip Platform for Magnetic Beads Density Measuring.....1071**  
Yushan Zheng<sup>1</sup>, Cyril Jacquemod<sup>2</sup>, Mohamad Sawan<sup>1</sup>  
*<sup>1</sup>École Polytechnique de Montréal, Canada; <sup>2</sup>Polytechnique Montréal, Canada*
- B2L-K.2**     **Characterization of Standard CMOS Compatible Photodiodes and Pixels for Lab-on-Chip Devices .....1075**  
Gözen Köklü<sup>1</sup>, Ralph Etienne-Cummings<sup>2</sup>, Yusuf Leblebici<sup>1</sup>, Giovanni De Micheli<sup>1</sup>, Sandro Carrara<sup>1</sup>  
*<sup>1</sup>École Polytechnique Fédérale de Lausanne, Switzerland; <sup>2</sup>Johns Hopkins University, United States*
- B2L-K.3**     **Human Respiratory Feature Extraction on an UWB Radar Signal Processing Platform.....1079**  
Chi-Hsuan Hsieh, Yi-Hsiang Shen, Yu-Fang Chiu, Ta-Shun Chu, Yuan-Hao Huang  
*National Tsing Hua University, Taiwan*
- B2L-K.4**     **Efficient Implementation of Real-Time ECG Derived Respiration System Using Cubic Spline Interpolation .....1083**  
Ali Shayeji, Pooya Ehsani, Mahdi Shabany  
*Sharif University of Technology, Iran*
- B2L-K.5**     **A Low Power Low Inaccuracy Linearity-Compensated Temperature Sensor for Attachable Medical Devices .....1087**  
Oh-Yong Jung, Seungjin Kim, Sok-Kyun Han, Sang-Gug Lee  
*Korea Advanced Institute of Science and Technology, Korea, South*

**B2L-L: SPECIAL SESSION: Perception-based Multimedia Quality of Experience (QoE) Evaluation**

Time: Tuesday, May 21, 2013, 11:30 - 13:00  
Room: Room 307B  
Chairs: Chenwei Deng, *Beijing Institute of Technology*  
Weisi Lin, *Nanyang Technological University*  
King Ngi Ngan, *The Chinese Univ. of Hong Kong*  
Lin Ma, *The Chinese Univ. of Hong Kong*

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- B2L-L.1 Overview of Quality Assessment for Visual Signals and Newly Emerged Trends .....1091**  
Lin Ma<sup>2</sup>, Chenwei Deng<sup>1</sup>, King Ngi Ngan<sup>2</sup>, Weisi Lin<sup>3</sup>  
<sup>1</sup>*Beijing Institute of Technology, China;* <sup>2</sup>*Chinese University of Hong Kong, Hong Kong;* <sup>3</sup>*Nanyang Technological University, Singapore*
- B2L-L.2 A New Reduced-Reference Image Quality Assessment Using Structural Degradation Model .....1095**  
Ke Gu, Guangtao Zhai, Xiaokang Yang, Wenjun Zhang  
*Shanghai Jiao Tong University, China*
- B2L-L.3 Paired Comparison for Subjective Multimedia Quality Assessment: Theory and Practice .....1099**  
Jong-Seok Lee  
*Yonsei University, Korea, South*
- B2L-L.4 Adaptive Contrast Adjustment for Postprocessing of Tone Mapped High Dynamic Range Images .....1103**  
Manish Narwaria, Matthieu Perreira Da Silva, Patrick Le Callet, Romuald Pepion  
*LUNAM University, France*
- B2L-L.5 On the Impact of Packet-Loss Impairments on Visual Attention Mechanisms .....1107**  
Judith Redi<sup>1</sup>, Ingrid Heynderickx<sup>1</sup>, Bruno Macchiavello<sup>2</sup>, Mylene Farias<sup>2</sup>  
<sup>1</sup>*Delft University of Technology, Netherlands;* <sup>2</sup>*Universidade de Brasilia, Brazil*

**B3L-A: Millimeter-wave & Optical Communications Circuits**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 301A

Chair: Jaehyok Choi, *Ulsan National Institute of Science & Technology*

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- B3L-A.1 A Transformer Neutralization Based 60GHz LNA in 65 nm LP CMOS with 22dB Gain and 5.5dB NF .....1111**  
Aili Wang, Lianming Li, Tiejun Cui  
*Southeast University, China*
- B3L-A.2 12.5-Gb/s Analog Front-End of an Optical Transceiver in 0.13- $\mu$ m CMOS .....1115**  
Dong-Wook Kim<sup>2</sup>, Han-Kyu Chi<sup>2</sup>, Yu-Sang Chun<sup>2</sup>, Myung-Heon Chin<sup>2</sup>, Gyungock Kim<sup>1</sup>, Deog-Kyoon Jeong<sup>2</sup>  
<sup>1</sup>*ETRI, Korea, South*; <sup>2</sup>*Seoul National University, Korea, South*
- B3L-A.3 A 12-40 GHz Low Phase Variation Highly Linear BiCMOS Variable Gain Amplifier....1119**  
Suman Sah, Siqi Zhu, Tai Nguyen, Xinmin Yu, Deukhyoun Heo  
*Washington State University, United States*
- B3L-A.4 A 3.4dB NF K-Band LNA in 65nm CMOS Technology.....1123**  
Jianfei Xu<sup>2</sup>, Na Yan<sup>2</sup>, Qiang Chen<sup>2</sup>, Jianjun Gao<sup>1</sup>, Xiaoyang Zeng<sup>2</sup>  
<sup>1</sup>*East China Normal University, China*; <sup>2</sup>*Fudan University, China*
- B3L-A.5 Inductorless, Power-Proportional, Optical Receiver Front-End in TSMC 90 nm.....1127**  
Partha Dash<sup>1</sup>, Glenn Cowan<sup>1</sup>, Odile Liboiron-Ladouceur<sup>2</sup>  
<sup>1</sup>*Concordia University, Canada*; <sup>2</sup>*McGill University, Canada*

**B3L-B: DSP for Communication**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 301B

Chairs: Xinping Huang, *Communication Research Center, Canada*  
Hakan Johansson, *Linkoping University*

---

- B3L-B.1 A New, Delay-Line-Discriminator-Based, Hybrid RF/Digital Phase Noise Cancellation Technique .....1131**  
Sam Gharavi, Babak Daneshrad  
*University of California, Los Angeles, United States*
- B3L-B.2 Multi-Carrier LINC Amplifier Calibration by Min-Minimum Criterion .....1135**  
Xinping Huang, Mario Caron  
*Communications Research Centre Canada, Canada*
- B3L-B.3 Improving the Error Correction Capability of Arithmetic Coding by Forecasting Forbidden Symbols .....1139**  
Qiuzhen Lin, Kwok-Wo Wong  
*City University of Hong Kong, Hong Kong*
- B3L-B.4 Novel Adaptive Soft Input Soft Output Demodulator for Serially Concatenated CPM Signals .....1143**  
Wenwen Wang, Saman Abeysekera  
*Nanyang Technological University, Singapore*
- B3L-B.5 Blind Identifiability of General Constellations .....1147**  
Xu Wang<sup>1</sup>, Rueywen Liu<sup>2</sup>, Fan He<sup>1</sup>, Tao Yang<sup>1</sup>, Bo Hu<sup>1</sup>  
<sup>1</sup>*Fudan University, China;* <sup>2</sup>*University of Notre Dame, United States*

**B3L-C: Visual Communication**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 302A

Chairs: Tian-Sheuan Chang, *National Chiao-Tung University*  
Viet Anh Nguyen, *Advanced Digital Sciences Center, Singapore*

---

- B3L-C.1 Channel Estimation for MIMO-OFDM Systems Based on Subspace Pursuit Algorithm .....1151**  
Enqing Chen, Xiaoqiang Xiang, Xiaomin Mu  
*ZhengZhou University, China*
- B3L-C.2 Adaptive Channel Scheduling for Scalable Video Broadcasting Over MIMO Wireless Networks .....1155**  
Chao Zhou, Xinggong Zhang, Zongming Guo  
*Peking University, China*
- B3L-C.3 Performance Analysis of Transform in Uncoded Wireless Visual Communication ...1159**  
Ruiqin Xiong<sup>2</sup>, Feng Wu<sup>1</sup>, Jizheng Xu<sup>1</sup>, Wen Gao<sup>2</sup>  
<sup>1</sup>*Microsoft Research Asia, China;* <sup>2</sup>*Peking University, China*
- B3L-C.4 Hybrid Digital-Analog Scheme for Video Transmission Over Wireless .....1163**  
Lei Yu, Houqiang Li, Weiping Li  
*University of Science and Technology of China, China*
- B3L-C.5 Adaptive Packet Encapsulation of Scalable Video Coding Bitstream .....1167**  
Haibo Zhu, Houqiang Li  
*University of Science and Technology of China, China*

**B3L-D: Wireline Communicatios I**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 302B

Chair: Zhongfeng Wang, *Broadcom Corp.*

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- B3L-D.1 A 10-bit Fast Lock All-Digital Data Recovery with CR Oscillator Reference for Automotive Network .....1171**  
Hironobu Akita, Takahisa Yoshimoto, Hirofumi Yamamoto, Nobuaki Matsudaira, Shigeki Ohtsuka, Shinichirou Taguchi  
*DENSO CORPORATION, Japan*
- B3L-D.2 Analysis of a Class of Decimated Clock/Data Recovery Architectures for Serial Links .....1175**  
Pervez Aziz, Amaresh Malipatil  
*LSI Corporation, United States*
- B3L-D.3 A PLL/DLL Based CDR with Delta-Sigma Frequency Tracking and Low Algorithmic Jitter Generation.....1179**  
Shuli Geng<sup>2</sup>, Ni Xu<sup>2</sup>, Jun Li<sup>3</sup>, Xueyi Yu<sup>1</sup>, Woogeun Rhee<sup>2</sup>, Zihua Wang<sup>2</sup>  
<sup>1</sup>Marvell, Shanghai, China; <sup>2</sup>Tsinghua University, China; <sup>3</sup>University of California, San Diego, United States
- B3L-D.4 A 0.7pJ/Bit 2Gbps Self-Synchronous Serial Link Receiver Using Gated-Ring Oscillator for Inductive Coupling Communication.....1183**  
Unsoo Ha, Hyunwoo Cho, Hoi-Jun Yoo  
*Korea Advanced Institute of Science and Technology, Korea, South*
- B3L-D.5 A Fully-Differential Adaptive Equalizer Using the Spectrum-Balancing Technique ...1187**  
Cecilia Gimeno, Erick Guerrero, Concepcion Aldea, Santiago Celma, Cristina Azcona  
*Universidad de Zaragoza, Spain*

**B3L-E: Image and Video Super Resolution**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 303A

Chair: Wan-Chi Siu, *Hong Kong Polytechnic University*

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- B3L-E.1 Fast Single Frame Super-Resolution Using Scale-Invariant Self-Similarity .....1191**  
Luhong Liang<sup>1</sup>, King Hung Chiu<sup>1</sup>, Edmund Y. Lam<sup>2</sup>  
<sup>1</sup>*Hong Kong Applied Science and Technology Research Institute, Hong Kong;*  
<sup>2</sup>*University of Hong Kong, Hong Kong*
- B3L-E.2 Spatially-Varying Super-Resolution for HDTV.....1195**  
Chih-Tsung Shen<sup>2</sup>, Hung-Hsun Liu<sup>1</sup>, Ming-Sui Lee<sup>2</sup>, Yi-Ping Hung<sup>2</sup>, Soo-Chang Pei<sup>2</sup>  
<sup>1</sup>*Chunghwa Telecom, Taiwan;* <sup>2</sup>*National Taiwan University, Taiwan*
- B3L-E.3 Robust Super-Resolution for Face Images via Principle Component Sparse Representation and Least Squares Regression.....1199**  
Tao Lu, Ruimin Hu, Zhen Han, Junjun Jiang, Yang Xia  
*Wuhan University, China*
- B3L-E.4 Illumination-Invariance and Nonlocal Means Based Super Resolution .....1203**  
Mengyan Wang, Jiaying Liu, Wei Bai, Zongming Guo  
*Peking University, China*
- B3L-E.5 Improving Dictionary Based Image Super-Resolution with Nonlocal Total Variation Regularization .....1207**  
Cheolkon Jung, Junwei Ju  
*Xidian University, China*



**B3L-F: SOC & Hardware-Software Codesign I**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 303B

Chairs: Wael Badawy, *IntelliView*

Qiaoyan Yu, *University of New Hampshire*

---

- B3L-F.1 Latency-Constrained Binding of Data Flow Graphs to Energy Conscious Gals-Based MPSoCs .....1212**  
Jude Angelo Ambrose, Isuru Nawinne, Sri Parameswaran  
*University of New South Wales, Australia*
- B3L-F.2 FPGA Implementation of a Scheduler Supporting Parallel Dataflow Execution .....1216**  
Junneng Zhang, Chao Wang, Xi Li, Xuehai Zhou  
*University of Science and Technology of China, China*
- B3L-F.3 Parallelization Techniques for Implementing Trellis Algorithms on Graphics Processors .....1220**  
Qi Zheng<sup>2</sup>, Yajing Chen<sup>2</sup>, Ronald Dreslinski<sup>2</sup>, Chaitali Chakrabarti<sup>1</sup>, Achilleas Anastasopoulos<sup>2</sup>, Scott Mahlke<sup>2</sup>, Trevor Mudge<sup>2</sup>  
<sup>1</sup>*Arizona State University, United States;* <sup>2</sup>*University of Michigan, United States*
- B3L-F.4 CASL Hypervisor and its Virtualization Platform .....1224**  
Chien-Te Liu, Kuan-Chung Chen, Chung-Ho Chen  
*National Cheng Kung University, Taiwan*
- B3L-F.5 Network Partitioning and GA Heuristic Crossover for NoC Application Mapping .....1228**  
Yin Zhen Tei, Muhammad Nadzir Marsono, Nasir Shaikh-Husin, Yuan Wen Hau  
*Universiti Teknologi Malaysia, Malaysia*

**B3L-G: Memory Circuits and Architectures I**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 305

Chairs: Ik-Joon Chang, *Kyung Hee University*  
Zhiyuan Yan, *Lehigh University*

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- B3L-G.1 Power-Aware Buddy System and Task Group Scheduler .....1232**  
Xi Li, Zongwei Zhu, Gangyong Jia, Xuehai Zhou  
*University of Science and Technology of China, China*
- B3L-G.2 Low-Energy and Low-Latency Error-Correction for Phase Change Memory .....1236**  
Xinmiao Zhang<sup>1</sup>, Fang Cai<sup>1</sup>, M.P Anantram<sup>2</sup>  
<sup>1</sup>Case Western Reserve University, United States; <sup>2</sup>University of Washington, United States
- B3L-G.3 Using Condition Flag Prediction to Improve the Performance of Out-of-Order Processors .....1240**  
Tzu-Hsuan Hsu, Ching-Wen Lin, Chung-Ho Chen  
*National Cheng Kung University, Taiwan*
- B3L-G.4 Designing Scratchpad Memory Architecture with Emerging STT-RAM Memory Technologies .....1244**  
Peng Wang<sup>1</sup>, Guangyu Sun<sup>1</sup>, Tao Wang<sup>1</sup>, Yuan Xie<sup>2</sup>, Jason Cong<sup>3</sup>  
<sup>1</sup>Peking University, China; <sup>2</sup>Pennsylvania State University, United States; <sup>3</sup>University of California, Los Angeles, United States
- B3L-G.5 An MTJ-Based Nonvolatile Associative Memory Architecture with Intelligent Power-Saving Scheme for High-Speed Low-Power Recognition Applications.....1248**  
Yitao Ma<sup>1</sup>, Tadashi Shibata<sup>2</sup>, Tetsuo Endoh<sup>1</sup>  
<sup>1</sup>Tohoku University, Japan; <sup>2</sup>University of Tokyo, Japan

**B3L-H: Delta-Sigma Modulators I**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 306A

Chairs: Jose M. de la Rosa, *Instituto de Microelectrónica de Sevilla*  
Viktor Gruev, *Washington University St. Louis*

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- B3L-H.1 Improved Characterization of High Speed Continuous-Time Delta Sigma Modulators Using a Duobinary Test Interface .....1252**  
Ankesh Jain, Shanthi Pavan  
*Indian Institute of Technology Madras, India*
- B3L-H.2 Hybrid Incremental-Sigma-Delta-ADC for Ambient Light Sensing Applications .....1256**  
Johannes Uhlig<sup>1</sup>, Stefan Haenzsche<sup>1</sup>, Johannes Görner<sup>1</sup>, Rene Schüffny<sup>1</sup>,  
Thomas Reichel<sup>2</sup>, Lars Göpfert<sup>2</sup>, Valeri Razhenikov<sup>2</sup>  
<sup>1</sup>*Technische Universität Dresden, Germany;* <sup>2</sup>*ZMD AG Dresden, Germany*
- B3L-H.3 Power and Area Efficient Comb-Based Decimator for Sigma-Delta ADCs with High Decimation Factors .....1260**  
Gerardo Molina Salgado<sup>2</sup>, Gordana Jovanovic Dolecek<sup>2</sup>, José M. de la Rosa<sup>1</sup>  
<sup>1</sup>*CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain;* <sup>2</sup>*Institute, INAOE, Mexico*
- B3L-H.4 Calculating Transfer Functions of CT Sigma-Delta Modulators with Arbitrary DAC Waveforms .....1264**  
Timon Brückner<sup>2</sup>, Martin Kiebler<sup>2</sup>, Matthias Lorenz<sup>2</sup>, Christoph Zorn<sup>1</sup>, Wolfgang Mathis<sup>1</sup>, Maurits Ortmanns<sup>2</sup>  
<sup>1</sup>*Leibniz University of Hannover, Germany;* <sup>2</sup>*Universität Ulm, Germany*
- B3L-H.5 Analysis and Design of High Speed/High Linearity Continuous Time Delta-Sigma Modulator .....1268**  
Chao Chu, Timon Brückner, John G. Kauffman, Jens Anders, Joachim Becker, Maurits Ortmanns  
*Universität Ulm, Germany*

**B3L-J: Analog Filters**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 306B

Chairs: Wouter Serdijn, *Delft University of Technology*  
Joseph Sylvester Chang, *Nanyang Technological University*

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- B3L-J.1 A Type of Lumped-Element-Based Analog Filters Based on Transversal Circuit Networks .....1272**  
Raul Loeches-Sánchez, Roberto Gómez-García  
*Universidad de Alcalá, Spain*
- B3L-J.2 A Steerable DC-1 GHz All-Pass Filter-Sum RF Space-Time 2-D Beam Filter in 65 nm CMOS .....1276**  
Chamith Wijenayake<sup>1</sup>, Arjuna Madanayake<sup>1</sup>, Yongsheng Xu<sup>2</sup>, Leonid Belostotski<sup>2</sup>, Len Bruton<sup>2</sup>  
<sup>1</sup>*University of Akron, United States;* <sup>2</sup>*University of Calgary, Canada*
- B3L-J.3 A 54dB-DR 1-GHz-Bandwidth Continuous-Time Low-Pass Filter with in-Band Noise Reduction .....1280**  
Marcello De Matteis<sup>1</sup>, Stefano D'Amico<sup>2</sup>, Giuseppe Cocciolo<sup>2</sup>, Marco De Blasi<sup>2</sup>, Andrea Baschiroto<sup>1</sup>  
<sup>1</sup>*Università degli Studi di Milano - Bicocca, Italy;* <sup>2</sup>*Università del Salento, Italy*
- B3L-J.4 An Inductorless 3-5 GHz Band-Pass Filter with Tunable Center Frequency in 90 nm CMOS .....1284**  
Tuan Anh Vu, Shanthi Sudalaiyandi, Håkon Andre Hjortland, Øivind Næss, Tor Sverre Lande  
*Universitetet i Oslo, Norway*
- B3L-J.5 Improved Technique for Continuous Tuning of CMOS Transconductor .....1288**  
Jose Maria Algueta<sup>3</sup>, Antonio J. Lopez-Martin<sup>3</sup>, Jaime Ramirez-Angulo<sup>1</sup>, Ramon G. Carvajal<sup>2</sup>  
<sup>1</sup>*New Mexico State University, United States;* <sup>2</sup>*Universidad de Sevilla, Spain;* <sup>3</sup>*Universidad Pública de Navarra, Spain*

**B3L-K: Biomedical Information Processing I**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 307A

Chairs: Yong Lian, *National University of Singapore*  
Herming Chiueh, *National Chiao Tung University*

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- B3L-K.1 Error Correction Algorithm for High Accuracy Bio-Impedance Measurement in Wearable Healthcare Applications ..... 1292**  
Rajkumar Chinnakonda Kubendran<sup>2</sup>, Sunyoung Kim<sup>1</sup>, Refet Firat Yazicioglu<sup>1</sup>  
<sup>1</sup>IMEC, Belgium; <sup>2</sup>Purdue University, United States
- B3L-K.2 An Efficient DCT-IV-Based ECG Compression Algorithm and its Hardware Accelerator Design..... 1296**  
Shin-Chi Lai, Wei-Che Chien, Chien-Sheng Lan, Meng-Kun Lee, Ching-Hisng Luo, Sheau-Fang Lei  
*National Cheng Kung University, Taiwan*
- B3L-K.3 Wireless Wearable ECG Sensor Design Based on Level-Crossing Sampling and Linear Interpolation ..... 1300**  
Yibin Hong, Zhixiong Xie, Yong Lian  
*National University of Singapore, Singapore*
- B3L-K.4 Influence of Prior Knowledge on the Accuracy Limit of Parameter Estimation in Single-Molecule Fluorescence Microscopy ..... 1304**  
Zhiping Lin<sup>1</sup>, Yau Wong<sup>1</sup>, Raimund Ober<sup>2</sup>  
<sup>1</sup>Nanyang Technological University, Singapore; <sup>2</sup>University of Texas at Dallas, United States
- B3L-K.5 Identification of Motor Neuron Disease Using Wavelet Domain Features Extracted from EMG Signal ..... 1308**  
Shaikh Anowarul Fattah<sup>1</sup>, A. B. M. Sayeed Ud Doulah<sup>1</sup>, Md. Asif Iqbal<sup>1</sup>, Celia Shahnaz<sup>1</sup>, Wei-Ping Zhu<sup>2</sup>, M. Omair Ahmad<sup>2</sup>  
<sup>1</sup>Bangladesh University of Engineering and Technology, Bangladesh; <sup>2</sup>Concordia University, Canada

**B3L-L: SPECIAL SESSION: Power Electronics for Smart Grid**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Room 307B

Chairs: Herbert H.C. Iu, *University of Western Australia*

Dylan D.C. Lu, *University of Sydney, Australia*

Akshay Kumar Rathore, *National University of Singapore*

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- B3L-L.1**      **Extracting Underlying Trend and Predicting Power Usage via Joint SSA and Sparse Binary Programming** .....1312  
Zhijing Yang<sup>1</sup>, Wing-Kuen Ling<sup>1</sup>, Chris Bingham<sup>2</sup>  
<sup>1</sup>*Guangdong University of Technology, China;* <sup>2</sup>*University of Lincoln, United Kingdom*
- B3L-L.2**      **Steady State Reliability of Maximum Power Point Tracking Algorithms Used with a Thermoelectric Generator** .....1316  
Ian Laird, Dylan Lu  
*University of Sydney, Australia*
- B3L-L.3**      **A Generalized Droop-Control Scheme for Decentralized Control of Inverter-Interfaced Microgrids** .....1320  
Fei Luo<sup>1</sup>, Yuk Ming Lai<sup>1</sup>, Ka Hong Loo<sup>1</sup>, Chi Kong Michael Tse<sup>1</sup>, Xinbo Ruan<sup>2</sup>  
<sup>1</sup>*Hong Kong Polytechnic University, Hong Kong;* <sup>2</sup>*Nanjing University of Aeronautics and Astronautics, China*
- B3L-L.4**      **Stability Issues in Cascade Connected Switching Converters for DC Microgrid Applications** .....1324  
Reham Haroun<sup>2</sup>, Abdelali El Aroudi<sup>1</sup>, Angel Cid-Pastor<sup>2</sup>, Luis Martinez-Salamero<sup>2</sup>  
<sup>1</sup>*Univeristat Rovira i Virgili, Spain;* <sup>2</sup>*Universitat Rovira i Virgili, Spain*
- B3L-L.5**      **A Isolated Bidirectional Interleaved Flyback Converter for Battery Backup System Application** .....1328  
Shih-Ming Chen, Tsorng-Juu Liang, Yong-Hong Huang  
*National Cheng Kung University, Taiwan*

**B4L-A: Error Correction Code Designs I**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 301A

Chair: Hanho Lee, *Inha University*

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- B4L-A.1 Low-Complexity Finite Alphabet Iterative Decoders for LDPC Codes .....1332**  
Fang Cai<sup>1</sup>, Xinmiao Zhang<sup>1</sup>, David Declercq<sup>2</sup>, Bane Vasic<sup>3</sup>, Dung Viet Nguyen<sup>3</sup>,  
Shiva Planjery<sup>3</sup>  
<sup>1</sup>Case Western Reserve University, United States; <sup>2</sup>ETIS Laboratory, France;  
<sup>3</sup>University of Arizona, United States
- B4L-A.2 Memory Efficient Ems Decoding for Non-Binary LDPC Codes.....1336**  
Leixin Zhou<sup>3</sup>, Jin Sha<sup>3</sup>, Yun Chen<sup>2</sup>, Zhongfeng Wang<sup>1</sup>  
<sup>1</sup>Broadcom Corporation, United States; <sup>2</sup>Fudan University, China; <sup>3</sup>Nanjing  
University, China
- B4L-A.3 Parallel Interleaver Architecture with New Scheduling Scheme for High  
Throughput Configurable Turbo Decoder.....1340**  
Guohui Wang<sup>2</sup>, Aida Vosoughi<sup>2</sup>, Hao Shen<sup>2</sup>, Joseph R. Cavallaro<sup>2</sup>, Yuanbin Guo<sup>1</sup>  
<sup>1</sup>Futurewei Technologies, United States; <sup>2</sup>Rice University, United States
- B4L-A.4 High-Performance Iterative BCH Decoder Architecture for 100 Gb/s Optical  
Communications .....1344**  
Jewong Yeon, Hanho Lee  
*Inha University, Korea, South*
- B4L-A.5 Low-Complexity Layered Iterative Hard-Reliability-Based Majority-Logic Decoder  
for Non-Binary Quasi-Cyclic LDPC Codes.....1348**  
Chenrong Xiong, Zhiyuan Yan  
*Lehigh University, United States*

**B4L-B: Advanced DSP Algorithm and Application**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 301B

Chairs: Wu-Sheng Lu, *University of Victoria*  
Zhiping Lin, *Nanyang Technological University*

---

- B4L-B.1 A New Algorithm for Compressive Sensing Based on Total-Variation Norm .....1352**  
Jeevan Pant, Wu-Sheng Lu, Andreas Antoniou  
*University of Victoria, Canada*
- B4L-B.2 A Two-Class Information Concealing System Based on Compressed Sensing .....1356**  
Valerio Cambareni<sup>3</sup>, Javier Haboba<sup>3</sup>, Fabio Pareschi<sup>2</sup>, Riccardo Rovatti<sup>3</sup>,  
Gianluca Setti<sup>2</sup>, Kwok-Wo Wong<sup>1</sup>  
<sup>1</sup>*City University of Hong Kong, Hong Kong*; <sup>2</sup>*Università degli Studi di Ferrara, Italy*;  
<sup>3</sup>*Università di Bologna, Italy*
- B4L-B.3 A Rakeness-Based Design Flow for Analog-to-Information Conversion by  
Compressive Sensing .....1360**  
Valerio Cambareni<sup>2</sup>, Mauro Mangia<sup>2</sup>, Fabio Pareschi<sup>1</sup>, Riccardo Rovatti<sup>2</sup>,  
Gianluca Setti<sup>1</sup>  
<sup>1</sup>*Università degli Studi di Ferrara, Italy*; <sup>2</sup>*Università di Bologna, Italy*
- B4L-B.4 Gating and Robust EKF Based Target Tracking in Mixed LOS/NLOS  
Environments .....1364**  
Lili Yi<sup>2</sup>, Sirajudeen Gulam Razul<sup>2</sup>, Zhiping Lin<sup>2</sup>, Chong Meng See<sup>1</sup>  
<sup>1</sup>*DSO National Laboratories, Singapore*; <sup>2</sup>*Nanyang Technological University,  
Singapore*
- B4L-B.5 Compressive Sensing Recovery from Non-Ideally Quantized Measurements .....1368**  
Hsuan-Tsung Wang<sup>2</sup>, Suvradip Ghosh<sup>2</sup>, Walter Leon-Salas<sup>1</sup>  
<sup>1</sup>*Purdue University, United States*; <sup>2</sup>*University of Missouri-Kansas City, United States*



**B4L-C: Architecture Design for Visual Coding and Signal Processing**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 302A

Chairs: Marco Mattavelli, *EPFL*  
Jorn Janneck, *Lund University*

---

- B4L-C.1 A Hardware CABAC Encoder for HEVC .....1372**  
Bin Peng, Dandan Ding, Xingguo Zhu, Lu Yu  
*Zhejiang University, China*
- B4L-C.2 Flexible Integer DCT Architectures for HEVC.....1376**  
Sang Yoon Park, Pramod Kumar Meher  
*Institute for Infocomm Research, Singapore*
- B4L-C.3 An FPGA Co-Processor for Adaptive Lane Departure Warning System.....1380**  
Wei Wang, Xinming Huang  
*Worcester Polytechnic Institute, United States*
- B4L-C.4 Buffer Optimization Based on Critical Path Analysis of a Dataflow Program Design .....1384**  
Simone Casale Brunet<sup>1</sup>, Marco Mattavelli<sup>1</sup>, Jorn Janneck<sup>2</sup>  
<sup>1</sup>*École Polytechnique Fédérale de Lausanne, Switzerland*; <sup>2</sup>*Lund University, Sweden*
- B4L-C.5 A New Bandwidth Adaptive Non-Local Kernel Regression Algorithm for Image/Video Restoration and its GPU Realization .....1388**  
Chong Wang, Shing-Chow Chan  
*University of Hong Kong, Hong Kong*

**B4L-D: Wireline Communications II**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 302B

Chair: Franklin Bien, *Ulsan National Institute of Science & Technology*

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|                |   |             |
|----------------|---|-------------|
| <b>B4L-D.1</b> | <b>A 7 mW 2.5 GHz Spread Spectrum Clock Generator Using Switch-Controlled Injection-Locked Oscillator .....</b>                   | <b>1392</b> |
|                | Jeongmin Yang, Young-Ju Kim, Lee-Sup Kim<br><i>Korea Advanced Institute of Science and Technology, Korea, South</i>               |             |
| <b>B4L-D.2</b> | <b>A 40Gb/s 860<math>\mu</math>W Single-Phase 4:1 Multiplexer in 45nm CMOS .....</b>  | <b>1396</b> |
|                | Elkim Roa, Byunghoo Jung<br><i>Purdue University, United States</i>   |             |
| <b>B4L-D.3</b> | <b>A Self-Calibrating Multi-VCO PLL Scheme with Leakage and Capacitive Modulation Mitigations .....</b>                           | <b>1400</b> |
|                | Yikui Jen Dong, Freeman Zhong<br><i>LSI Corporation, United States</i>  |             |
| <b>B4L-D.4</b> | <b>A 52 dBc MTPR Line Driver for Powerline Communication HomePlug AV Standard in 0.18-<math>\mu</math>m CMOS Technology .....</b> | <b>1404</b> |
|                | Pang-Kai Liu, Szu-Yao Hung, Chang-Yi Liu, Min-Han Hsieh, Charlie Chung-Ping Chen<br><i>National Taiwan University, Taiwan</i>     |             |
| <b>B4L-D.5</b> | <b>SSC Tracking Analysis and a Deeper-SSC Estimator.....</b>  | <b>1408</b> |
|                | Yaming Zhang, Weixin Gai<br><i>Peking University, China</i>   |             |

**B4L-E: Video coding**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 303A

Chairs: Houqiang Li, *University of Science & Technology of China*  
Moncef Gabbouj, *Tampere University of Technology*

---

- B4L-E.1 Video Compression Using 3D Multiscale Recurrent Patterns .....1412**  
Nelson Francisco<sup>1</sup>, Nuno Rodrigues<sup>2</sup>, Eduardo da Silva<sup>3</sup>, Murilo de Carvalho<sup>4</sup>,  
Sérgio de Faria<sup>1</sup>  
<sup>1</sup>*Instituto de Telecomunicações, Portugal*; <sup>2</sup>*Instituto Politécnico Leiria, Portugal*;  
<sup>3</sup>*Universidade Federal do Rio de Janeiro, Brazil*; <sup>4</sup>*Universidade Federal Fluminense,*  
*Brazil*
- B4L-E.2 Effective Early Termination Using Adaptive Search Order for Frame Rate Up-  
Conversion.....1416**  
Yong Guo, Zhiyong Gao, Li Chen, Xiaoyun Zhang  
*Shanghai Jiao Tong University, China*
- B4L-E.3 Stereo Matching by Adaptive Weighting Selection Based Cost Aggregation.....1420**  
Lingfeng Xu<sup>1</sup>, Oscar C. Au<sup>1</sup>, Wenxiu Sun<sup>1</sup>, Lu Fang<sup>2</sup>, Ketan Tang<sup>1</sup>, Jiali Li<sup>1</sup>,  
Yuanfang Guo<sup>1</sup>  
<sup>1</sup>*Hong Kong University of Science and Technology, Hong Kong*; <sup>2</sup>*University of*  
*Science and Technology of China, China*
- B4L-E.4 Line-Based Distributed Coding Scheme for Onboard Lossless Compression of  
High-Resolution Stereo Images .....1424**  
Jinlei Zhang, Houqiang Li  
*University of Science and Technology of China, China*
- B4L-E.5 Personal Photo Album Compression and Management.....1428**  
Ruobing Zou, Oscar C. Au, Guyue Zhou, Wei Dai, Wei Hu, Pengfei Wan  
*Hong Kong University of Science and Technology, China*

**B4L-F: Specialized VLSI Circuits**  
Time: Tuesday, May 21, 2013, 16:20 - 17:50  
Room: Room 303B  
Chairs: Oscar Gustafsson, *Linkoping University*  
Pinaki Mazumder, *University of Michigan*

---

- B4L-F.1 Concurrent Faulty Clock Detection for Crypto Circuits Against Clock Glitch Based DFA .....1432**  
Hiroaki Igarashi, Youhua Shi, Masao Yanagisawa, Nozomu Togawa  
*Waseda University, Japan*
- B4L-F.2 A High-Performance Low-Power SoC for Mobile One-Time Password Applications .....1436**  
Songping Mai, Chunhong Li, Yixin Zhao, Chun Zhang, Zhihua Wang  
*Tsinghua University, China*
- B4L-F.3 High-Efficient Hardware Design Based on Enhanced Tschirnhaus Transform for Solving the LSPs .....1440**  
Chung-Hsien Chang<sup>1</sup>, Shi-Huang Chen<sup>2</sup>, Bo-Wei Chen<sup>1</sup>, Chih-Hsiang Peng<sup>1</sup>,  
Jhing-Fa Wang<sup>1</sup>  
<sup>1</sup>*National Cheng Kung university, Taiwan*; <sup>2</sup>*Shu-Te university, Taiwan*
- B4L-F.4 PCKGen: a Phase Change Memory Based Cryptographic Key Generator .....1444**  
Le Zhang, Zhi Hui Kong, Chip Hong Chang  
*Nanyang Technological University, Singapore*
- B4L-F.5 39.9 GOPs/Watt Multi-Mode CGRA Accelerator for a Multi-Standard Basestation .....1448**  
Nasim Farahini<sup>2</sup>, Shuo Li<sup>2</sup>, Muhamamd Adeel Tajammul<sup>2</sup>, Muhammad Ali  
Shami<sup>2</sup>, Guo Chen<sup>2</sup>, Ahmed Hemani<sup>2</sup>, Wei Ye<sup>1</sup>  
<sup>1</sup>*Huawei Technologies, China*; <sup>2</sup>*KTH Royal Institute of Technology, Sweden*

**B4L-G: Memory Circuits and Architectures II**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 305

Chairs: Kwen-Siong Chong, *Nanyang Technological University*  
Zhongfeng Wang, *Broadcom Corp.*

---

- B4L-G.1 Multiple-Pulse Dynamic Stability and Failure Analysis of Low-Voltage 6T-SRAM Bitcells in 28nm UTBB-FDSOI.....1452**  
Kaya Can Akyel<sup>3</sup>, Lorenzo Ciampolini<sup>4</sup>, Olivier Thomas<sup>1</sup>, Bertrand Pelloux-Prayer<sup>4</sup>, Shishir Kumar<sup>5</sup>, Philippe Flatresse<sup>4</sup>, Christophe Lecocq<sup>4</sup>, Gérard Ghibaudo<sup>2</sup>  
<sup>1</sup>CEA LETI, France; <sup>2</sup>IMEP-LAHC Minatec, France; <sup>3</sup>STMicroelectronics, France; <sup>4</sup>STMicroelectronics CCDS Crolles, France; <sup>5</sup>STMicroelectronics CCDS Noida, India
- B4L-G.2 An Improved Read/Write Scheme for Anchorless NEMS-CMOS Non-Volatile Memory.....1456**  
Anh Tuan Do<sup>2</sup>, Karthik Gopal Jayaraman<sup>2</sup>, Vincent Pott<sup>1</sup>, Geng L. Chua<sup>1</sup>, Pushpapraj Singh<sup>1</sup>, Kiat Seng Yeo<sup>2</sup>, Tony Tae Hyoung Kim<sup>2</sup>  
<sup>1</sup>Agency for Science, Technology and Research, Singapore; <sup>2</sup>Nanyang Technological University, Singapore
- B4L-G.3 CMOS SRAM Scaling Limits Under Optimum Stability Constraints.....1460**  
Adam Makosiej<sup>2</sup>, Olivier Thomas<sup>1</sup>, Amara Amara<sup>2</sup>, Andrei Vladimirescu<sup>3</sup>  
<sup>1</sup>CEA LETI, France; <sup>2</sup>Institut Supérieur d'Electronique de Paris, France; <sup>3</sup>Institut Supérieur d'Electronique de Paris and University of California, Berkeley, France
- B4L-G.4 0.18  $\mu\text{m}$  CMOS Process Photodiode Memory.....1464**  
Takayuki Kubota, Minoru Watanabe  
*Shizuoka University, Japan*
- B4L-G.5 A 40nm 1.0Mb Pipeline 6T SRAM with Variation-Tolerant Step-Up Word-Line and Adaptive Data-Aware Write-Assist .....1468**  
Chi-Shin Chang<sup>2</sup>, Hao-I Yang<sup>2</sup>, Wei-Nan Liao<sup>2</sup>, Yi-Wei Lin<sup>2</sup>, Nan-Chun Lien<sup>2</sup>, Chien-Hen Chen<sup>2</sup>, Ching-Te Chuang<sup>2</sup>, Wei Hwang<sup>2</sup>, Shyh-Jye Jou<sup>2</sup>, Ming-Hsien Tu<sup>1</sup>, Huan-Shun Huang<sup>1</sup>, Yong-Jyun Hu<sup>1</sup>, Paul-Sen Kan<sup>1</sup>, Cheng-Yo Cheng<sup>1</sup>, Wei-Chang Wang<sup>1</sup>, Jian-Hao Wang<sup>1</sup>, Kuen-Di Lee<sup>1</sup>, Chia-Cheng Chen<sup>1</sup>, Wei-Chiang Shih<sup>1</sup>  
<sup>1</sup>Faraday Technology Corporation, Taiwan; <sup>2</sup>National Chiao Tung University, Taiwan

**B4L-H: Regulator and Reference Circuits**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 306A

Chairs: Gabriel Rincon-Mora, *Georgia Tech*  
Igor Filanovsky, *University of Alberta*

---

- B4L-H.1**      **An Auto-Reconfigurable Dual-Output SC DC-DC Regulator with Sub-Harmonic Fixed on-Time Control for Energy-Harvesting Applications .....1472**  
Zhe Hua<sup>2</sup>, Hoi Lee<sup>2</sup>, Xiwen Zhang<sup>1</sup>  
<sup>1</sup>Texas Instruments, United States; <sup>2</sup>University of Texas at Dallas, United States
- B4L-H.2**      **An All-Subthreshold, 0.75V Supply, 2ppm/ C, CMOS Voltage Reference .....1476**  
Charalambos Andreou, Julius Georgiou  
*University of Cyprus, Cyprus*
- B4L-H.3**      **A Low Voltage Low Output Impedance CMOS Bandgap Voltage Reference .....1480**  
Edward Lee  
*Alfred Mann Foundation, United States*
- B4L-H.4**      **Output-Capacitorless CMOS LDO Regulator Based on High Slew-Rate Current-Mode Transconductance Amplifier .....1484**  
Alireza Saberhari<sup>2</sup>, Rasoul Fathipour<sup>2</sup>, Herminio Martínez<sup>1</sup>, Alberto Poveda<sup>1</sup>,  
Eduard Alarcón<sup>1</sup>  
<sup>1</sup>Universitat Politècnica de Catalunya, Spain; <sup>2</sup>University of Guilan, Iran
- B4L-H.5**      **A FVF Based Output Capacitorless LDO Regulator with Wide Load Capacitance Range .....1488**  
Kuan Chuang Koay, Sau Siong Chong, Pak Kwong Chan  
*Nanyang Technological University, Singapore*

**B4L-J: Interface Circuits**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 306B

Chairs: Mohamad Sawan, *Polytechnique Montreal*  
Joseph Sylvester Chang, *Nanyang Technological University*

---

- B4L-J.1**     **An Interface for the I2C Protocol in the Waferboard™ .....1492**  
Wasim Hussain<sup>1</sup>, Yvon Savaria<sup>1</sup>, Yves Blaquièrè<sup>2</sup>  
<sup>1</sup>École Polytechnique de Montréal, Canada; <sup>2</sup>Université du Québec à Montréal,  
Canada
- B4L-J.2**     **A Radiation-Hardened DLL with Fine Resolution and DCC for DDR2 Memory  
Interface in 0.13µm CMOS .....1496**  
Siyu Yang, Deping Huang, Xiaoke Wen, Lei Chen, Jinghong Chen  
*Southern Methodist University, United States*
- B4L-J.3**     **A 0.3mm<sup>2</sup> 60µW 11.2b ENOB Signal Acquisition ASIC for Resistive Bridge  
Sensors .....1500**  
Alan Pun, Jeff Wong, Gigi Chan, William Wong, David Kwong, Kc Wang  
*Hong Kong Applied Science and Technology Research Institute, Hong Kong*
- B4L-J.4**     **A 5-V 555-µW 0.8-µm CMOS MEMS Capacitive Sensor Interface Using Correlated  
Level Shifting .....1504**  
Jack Shiah, Shahriar Mirabbasi  
*University of British Columbia, Canada*
- B4L-J.5**     **A Low-Power Ratiometric Single/Differential Quasi-Digital Converter .....1508**  
Cristina Azcona, Belén Calvo, Santiago Celma, Nicolás Medrano, Pedro Antonio  
Martínez  
*Universidad de Zaragoza, Spain*

**B4L-K: Biomedical Information Processing II**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Room 307A

Chairs: Gianluca Setti, *Universita' di Bologna*  
Xiao Liu, *Brunel University*

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- B4L-K.1 High Effective Medical Image Segmentation with Model Adjustable Method .....1512**  
Yiwu Yao, Yuhua Cheng  
*Peking University, China*
- B4L-K.2 Lobe Asymmetry-Based Automatic Classification of Brain Magnetic Resonance Images .....1516**  
Salim Lahmiri, Mounir Boukadoum  
*University of Quebec at Montreal, Canada*
- B4L-K.3 Reconstruction of Neural Action Potentials Using Signal Dependent Sparse Representations .....1520**  
Jie Zhang<sup>2</sup>, Yuanming Suo<sup>2</sup>, Srinjoy Mitra<sup>1</sup>, Sang Peter Chin<sup>2</sup>, Trac Tran<sup>2</sup>, Refet Firat Yazicioglu<sup>1</sup>, Ralph Etienne-Cummings<sup>2</sup>  
<sup>1</sup>*IMEC, Belgium;* <sup>2</sup>*Johns Hopkins University, United States*
- B4L-K.4 Estimation of Time-Varying Autocorrelation and its Application to Time-Frequency Analysis of Nonstationary Signals .....1524**  
Zening Fu, Zhiguo Zhang, Shing-Chow Chan  
*University of Hong Kong, Hong Kong*
- B4L-K.5 Real-Time Assessment of Vigilance Level Using an Innovative Mindo4 Wireless EEG System .....1528**  
Chin-Teng Lin, Chun-Hsiang Chuang, Chih-Sheng Huang, Yen-Hsuan Chen, Li-Wei Ko  
*National Chiao Tung University, Taiwan*



**B4L-L: SPECIAL SESSION: Nonlinear Methods for Power Grids with Renewable Energy Sources**

Time: Tuesday, May 21, 2013, 16:20 - 17:50  
Room: Room 307B  
Chair: Hsiao-Dong Chiang, *Cornell University*

---

- B4L-L.1 Convergence Regions of Newton Method in Power Flow Studies: Numerical Studies .....1532**  
Jiao-Jiao Deng<sup>3</sup>, Tian-Qi Zhao<sup>3</sup>, Hsiao-Dong Chiang<sup>2</sup>, Yong Tang<sup>1</sup>, Yi Wang<sup>1</sup>  
<sup>1</sup>*China Electric Power Research Institute, China*; <sup>2</sup>*Cornell University, United States*;  
<sup>3</sup>*Tianjin University, China*
- B4L-L.2 Homotopy-Enhanced Power Flow Methods for General Distribution Networks with Distributed Generators .....1536**  
Tian-Qi Zhao<sup>1</sup>, Jiao-Jiao Deng<sup>1</sup>, Kaoru Koyanagi<sup>2</sup>  
<sup>1</sup>*Tianjin University, China*; <sup>2</sup>*Waseda University, Japan*
- B4L-L.3 Probabilistic Load Margins of Power Systems Embedded with Wind Farms .....1540**  
Jian Hong Liu, Jia Long Shyu, Chia Chi Chu  
*National Tsing Hua University, Taiwan*
- B4L-L.4 Modeling and Simulation of Information-Embedded Multi-Converter Power Systems .....1544**  
Chika Nwankpa, Juan Jimenez, Sachi Jayasuriya  
*Drexel University, United States*
- B4L-L.5 Towards Development of a CUEP Method for Network-Preserving Power System Models .....1548**  
Luís Fernando Alberto<sup>2</sup>, Warut Suampun<sup>1</sup>, Hsiao-Dong Chiang<sup>1</sup>  
<sup>1</sup>*Cornell University, United States*; <sup>2</sup>*Universidade de São Paulo, Brazil*

**B5P-N: Error Correction Code Designs II**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Poster Area

Chair: Zhongfeng Wang, *Broadcom Corp.*

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- B5P-N.1 Optimized Algorithms for Binary BCH Codes .....1552**  
Min Yin<sup>1</sup>, Menwang Xie<sup>2</sup>, Bo Yi<sup>2</sup>  
*<sup>1</sup>IBM GCG Systems & Technology Lab, China; <sup>2</sup>University of Science and Technology of China, China*
- B5P-N.2 Two Programmable BCH Soft Decoders for High Rate Codes with Large Word Length .....1556**  
Mohamed Osman<sup>1</sup>, Hossam A. H. Fahmy<sup>1</sup>, Yasmine A. H. Fahmy<sup>1</sup>, Maha Elsabrouty<sup>2</sup>  
*<sup>1</sup>Cairo University, Egypt; <sup>2</sup>Egypt-Japan University of Science and Technology, Egypt*
- B5P-N.3 Low-Power Design of Reed-Solomon Encoders .....1560**  
Wei Zhang<sup>2</sup>, Jing Wang<sup>2</sup>, Xinmiao Zhang<sup>1</sup>  
*<sup>1</sup>Case Western Reserve University, United States; <sup>2</sup>Tianjin University, China*
- B5P-N.4 Analog and Digital Approaches for an Energy Efficient Low Complexity Channel Decoder .....1564**  
Reza Meraji, S.M. Yasser Sherazi, John B. Anderson, Henrik Sjöland, Viktor Öwall  
*Lund University, Sweden*
- B5P-N.5 Dependability-Increasing Technique for a Multi-Context Optically Reconfigurable Gate Array .....1568**  
Akira Tanigawa, Minoru Watanabe  
*Shizuoka University, Japan*

**B5P-P: Low Power Design**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Poster Area

Chair: Vassilis Paliouras, *University of Patras*

---

- B5P-P.1 System Analysis and Energy Model for Radio-Triggered Battery-Less Monolithic Wireless Sensor Receiver .....1572**  
Hao Gao, Yan Wu, Marion Matters-Kammerer, Jean-Paul Linnartz, Arthur van Roermund, Peter Baltus  
*Eindhoven University of Technology, Netherlands*
- B5P-P.2 A 1.26mW/Gbps 8 Locking Cycles Versatile All-Digital CDR with TDC Combined DLL .....1576**  
Yuki Urano, Won-Joo Yun, Tadahiro Kuroda, Hiroki Ishikuro  
*Keio University, Japan*
- B5P-P.3 Improved Lifetime Routing for Wireless Sensor Networks .....1580**  
Hamid Rafiei Karkvandi, Efraim Pecht, Orly Yadid-Pecht  
*University of Calgary, Calgary, Canada*
- B5P-P.4 A Super-Regenerative Pulsed UWB Receiver Combined with Injection-Locking .....1584**  
Tongning Hu, Bo Wang, Shan Liu, Yi Peng, Jinhai Zhang, Jinpeng Shen, Xinan Wang  
*Peking University, China*
- B5P-P.5 A UWB Mixer with a Balanced Wide Band Active Balun Using Crossing Centertaped Inductor .....1588**  
Xiangrong Zhang, Xiaole Cui, Bo Wang, Chung Len Lee  
*Peking University, China*

**B5P-Q: Applications of Neural Networks and Systems I**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Poster Area

Chair: Kai-Kuang Ma, *Nanyang Technological University*

---

- B5P-Q.1**     **An Improved aVLSI Axon with Programmable Delay Using Spike Timing  
Dependent Delay Plasticity .....1592**  
Runchun Wang<sup>2</sup>, Gregory Cohen<sup>2</sup>, Tara Hamilton<sup>1</sup>, Jonathan Tapson<sup>2</sup>, André van  
Schaik<sup>2</sup>  
*<sup>1</sup>University of New South Wales, Australia; <sup>2</sup>University of Western Sydney, Australia*
- B5P-Q.2**     **Stochastic Resonance in an Analog Current-Mode Neuromorphic Circuit .....1596**  
Damien Querlioz, Vincent Trauchesse  
*Université Paris-Sud 11, France*
- B5P-Q.3**     **A Floating-Gate Analog Memory with Bidirectional Sigmoid Updates in a  
Standard Digital Process .....1600**  
Junjie Lu, Jeremy Holleman  
*University of Tennessee, Knoxville, United States*
- B5P-Q.4**     **Genetic Algorithm with Virus Infection for Finding Approximate Solution .....1604**  
Takuya Inoue, Yoko Uwate, Yoshifumi Nishio  
*Tokushima University, Japan*
- B5P-Q.5**     **A Multi-Modal and Tunable Radial-Basis-Funtion Circuit with Supply and  
Temperature Compensation .....1608**  
Kyuho Lee, Junyoung Park, Gyeonghoon Kim, Injoon Hong, Hoi-Jun Yoo  
*Korea Advanced Institute of Science and Technology, Korea, South*

**B5P-R: Applications of Neural Networks and Systems II**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Poster Area

Chair: Wei-Ping Zhu, *Concordia University*

---

- B5P-R.1 Analog Implementation of Encoded Neural Networks.....1612**  
Benoit Larras, Cyril Lahuec, Matthieu Arzel, Fabrice Seguin  
*Télécom Bretagne, France*
- B5P-R.2 Excitatory and Inhibitory Memristive Synapses for Spiking Neural Networks.....1616**  
Gwendal Lecerf, Jean Tomas, Sylvain Saïghi  
*L'Université de Bordeaux, France*
- B5P-R.3 A Spiking-Neuron Collective Analog Adder with Scalable Precision.....1620**  
Sung Sik Woo, Rahul Sarpeshkar  
*Massachusetts Institute of Technology, United States*
- B5P-R.4 Spike-Based Analog-Digital Neuromorphic Information Processing System for Sensor Applications.....1624**  
Giovanny Sánchez<sup>1</sup>, Thomas Jacob Koickal<sup>2</sup>, Athul Sripad Tiruvendipura<sup>1</sup>, Luiz Carlos Gouveia<sup>2</sup>, Alister Hamilton<sup>2</sup>, Jordi Madrenas<sup>1</sup>  
<sup>1</sup>*Universitat Politècnica de Catalunya, Spain;* <sup>2</sup>*University of Edinburgh, United Kingdom*
- B5P-R.5 Application of Neural Networks with CSD Coefficients for Human Face Recognition.....1628**  
Ayesa Parvin, Majid Ahmadi, Roberto Muscedere  
*University of Windsor, Canada*

**B5P-S:      Advanced Visual Signal Coding II**

Time:        Tuesday, May 21, 2013, 09:40 - 11:10

Room:        Poster Area

Chairs:      Yo-Sung Ho, *Gwangju Institute of Science and Technology, Korea*  
              Yap-Peng Tan, *Nanyang Technological University*

---

- B5P-S.1      Disparity Vector Based Advanced Inter-View Prediction in 3D-HEVC .....1632**  
Li Zhang, Ying Chen, Marta Karczewicz  
*Qualcomm Technology Inc., United States*
- B5P-S.2      Inter-Layer Intra Mode Coding for the Scalable Extension of HEVC .....1636**  
Zhijie Zhao<sup>1</sup>, Junyong Si<sup>2</sup>, Joern Ostermann<sup>1</sup>, Weiping Li<sup>2</sup>  
<sup>1</sup>*Leibniz Universitaet Hannover, Germany;* <sup>2</sup>*University of Science and Technology of  
China, China*
- B5P-S.3      Fast Zero Block Detection and Early CU Termination for HEVC Video Coding .....1640**  
Pai-Tse Chiang, Tian-Sheuan Chang  
*National Chiao Tung University, Taiwan*
- B5P-S.4      Directional Block Compressed Sensing for Image Coding .....1644**  
Lei Liu<sup>1</sup>, Anhong Wang<sup>2</sup>, Kongfen Zhu<sup>2</sup>, Chunyu Lin<sup>1</sup>, Yao Zhao<sup>1</sup>  
<sup>1</sup>*Beijing Jiaotong University, China;* <sup>2</sup>*Taiyuan University of Science and Technology,  
China*
- B5P-S.5      A Mode-Mapping and Optimized MV Conjunction Based MGS-Scalable SVC to  
AVC IPPP Transcoder .....1648**  
Lei Sun<sup>2</sup>, Zhenyu Liu<sup>1</sup>, Takeshi Ikenaga<sup>2</sup>  
<sup>1</sup>*Tsinghua University, China;* <sup>2</sup>*Waseda University, Japan*

**B5P-T: SOC & Hardware-Software Codesign II**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Poster Area

Chairs: Hanho Lee, *Inha University*.

Izzet Kale, *University of Westminster*

---

- B5P-T.1 Time-Division-Multiplexer Based Routing Algorithm for NoC System .....1652**  
Ming'E Jing<sup>1</sup>, Zhiyi Yu<sup>2</sup>, Xiaoyang Zeng<sup>2</sup>, Liyang Zhou<sup>3</sup>  
<sup>1</sup>Fudan Univerisity, China; <sup>2</sup>Fudan University, China; <sup>3</sup>Spreadtrum Company, China
- B5P-T.2 Implementation and Optimization of 3780-Point FFT on Multi-Core System.....1656**  
Ming'E Jing<sup>2</sup>, Zhiyi Yu<sup>3</sup>, Xiaoyang Zeng<sup>3</sup>, Jiayi Sheng<sup>1</sup>, Haofan Yang<sup>4</sup>  
<sup>1</sup>Boston University, United States; <sup>2</sup>Fudan Univerisity, China; <sup>3</sup>Fudan University, China; <sup>4</sup>Toronto University, Canada
- B5P-T.3 Traffic- and Thermal-Aware Adaptive Beltway Routing for Three Dimensional Network-on-Chip Systems.....1660**  
Kun-Chih Chen, Che-Chuan Kuo, Hui-Shun Hung, An-Yeu Wu  
*National Taiwan University, Taiwan*
- B5P-T.4 A Run-Time Adaptive Multiprocessor System .....1664**  
Mateus Rutzig<sup>1</sup>, Antonio Carlos Beck<sup>2</sup>, Luigi Carro<sup>2</sup>  
<sup>1</sup>Universidade Federal de Santa Maria, Brazil; <sup>2</sup>Universidade Federal do Rio Grande do Sul, Brazil
- B5P-T.5 High-Performance Multiplierless Transform Architecture for HEVC.....1668**  
Wenjun Zhao<sup>1</sup>, Takao Onoye<sup>1</sup>, Tian Song<sup>2</sup>  
<sup>1</sup>Osaka University, Japan; <sup>2</sup>Tokushima University, Japan

**B5P-U: Emerging Topics in VLSI**

Time: Tuesday, May 21, 2013, 09:40 - 11:10

Room: Poster Area

Chairs: Pinaki Mazumder, *University of Michigan*  
Sau Gee Chen, *National Chiao Tung University*

---

- B5P-U.1 TSV-Based on-Chip Inductive Coupling Communications .....1672**  
Khaled Salah<sup>3</sup>, Alaa El-Rouby<sup>3</sup>, Hani Ragai<sup>1</sup>, Yehea Ismail<sup>2</sup>  
<sup>1</sup>Ain Shams University, Egypt; <sup>2</sup>American University in Cairo, Egypt; <sup>3</sup>Mentor Graphics, Egypt
- B5P-U.2 Differential Pair Sense Amplifier for a Robust Reading Scheme for Memristor-Based Memories .....1676**  
Sami Smaili, Yehia Massoud  
Worcester Polytechnic Institute, United States
- B5P-U.3 Muller C-Element Based Decoder (MCD): a Decoder Against Transient Faults .....1680**  
Yangyang Tang<sup>3</sup>, Emmanuel Boutillon<sup>3</sup>, Chris Winstead<sup>4</sup>, Christophe Jégo<sup>1</sup>, Michel Jézéquel<sup>2</sup>  
<sup>1</sup>Institut Polytechnique Bordeaux, France; <sup>2</sup>Institut TELECOM/TELECOM Bretagne, France; <sup>3</sup>Université de Bretagne Sud, France; <sup>4</sup>Utah State University, United States
- B5P-U.4 Design and Verification of an All-Digital on-Chip Process Variation Sensor .....1684**  
Reum Oh<sup>2</sup>, Jiwoong Jang<sup>1</sup>, Man Young Sung<sup>1</sup>  
<sup>1</sup>Korea University, Korea, South; <sup>2</sup>Korea University, Samsung Elec., Korea, South
- B5P-U.5 A Decoding Algorithm with Reduced Complexity for Non-Binary LDPC Codes Over Large Fields .....1688**  
Jun Lin, Zhiyuan Yan  
Lehigh University, United States



**B6P-N: Analog Circuit Techniques III**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chair: Shahriar Mirabbasi, *University of British Columbia*

---

- B6P-N.1 A Meminductive Circuit Based on Floating Memristive Emulator .....1692**  
Dongsheng Yu<sup>1</sup>, Hao Chen<sup>1</sup>, Herbert Ho-Ching lu<sup>2</sup>  
<sup>1</sup>*China University of Mining and Technology, China;* <sup>2</sup>*University of Western Australia, Australia*
- B6P-N.3 New Implementation of Time Domain Measurement of Quality Factor .....1700**  
Ming Zhang<sup>2</sup>, Nicolas Llaser<sup>2</sup>, Xusheng Wang<sup>2</sup>, Francis Rodes<sup>1</sup>, Romain Deniéport<sup>1</sup>  
<sup>1</sup>*ENSEIRB, France;* <sup>2</sup>*Université Paris-Sud 11, France*
- B6P-N.4 A LUT-Free DC Offset Calibration Method for Removing the PGA-Gain-  
Correlated Offset Residue .....1704**  
Lingwei Zhang, Hanjun Jiang, Fule Li, Jingjing Dong, Zhihua Wang  
*Tsinghua University, China*
- B6P-N.5 A Monolithic CMOS Automatic Biasing System for 40GHz Multistage HEMT .....1708**  
Marco De Blasi<sup>2</sup>, Mino Pierri<sup>2</sup>, Stefano D'Amico<sup>2</sup>, Marcello De Matteis<sup>1</sup>, Andrea Baschiroto<sup>1</sup>, Alessandro Bau<sup>1</sup>, A Passerini<sup>1</sup>, Massimo Gervasi<sup>1</sup>, Mario Zannoni<sup>1</sup>  
<sup>1</sup>*Università degli Studi di Milano - Bicocca, Italy;* <sup>2</sup>*Università del Salento, Italy*

**B6P-P: Physical and Low-level Synthesis and Test**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chair: Yu Wang, *Tsinghua University*

---

- B6P-P.1 An Analytical Model of the Overshooting Effect for Multiple-Input Gates in Nanometer Technologies .....1712**  
Li Ding<sup>2</sup>, Jing Wang<sup>2</sup>, Zhangcai Huang<sup>2</sup>, Atsushi Kurokawa<sup>1</sup>, Yasuaki Inoue<sup>2</sup>  
*<sup>1</sup>Hirosaki University, Japan; <sup>2</sup>Waseda University, Japan*
- B6P-P.2 A Rapid Analog Amendment Framework Using the Incremental Floorplanning Technique .....1716**  
Sheng-Jhih Jiang, Tsung-Yi Ho  
*National Cheng Kung University, Taiwan*
- B6P-P.3 Post-Layout Redundant Wire Insertion for Fixing Min-Delay Violations .....1720**  
Jin-Tai Yan, Zhi-Wei Chen  
*Chung Hua University, Taiwan*
- B6P-P.4 Feasible Transition Path Generation for EFSM-Based System Testing.....1724**  
Sieng Wong, Chia Yee Ooi, Yuan Wen Hau, Muhammad Nadzir Marsono, Nasir Shaikh-Husin  
*Universiti Teknologi Malaysia, Malaysia*
- B6P-P.5 Rules Maps for Scheduling Algorithm Knowledge .....1728**  
Martin Dubois, Mounir Boukadoum  
*University of Quebec at Montreal, Canada*

**B6P-Q: High Level Design Tools**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chair: Qiang Liu, *Tianjin University*

---

- B6P-Q.1 Topology-Aware Floorplanning for 3D Application-Specific Network-on-Chip Synthesis .....1732**  
Bo Huang<sup>3</sup>, Song Chen<sup>1</sup>, Wei Zhong<sup>2</sup>, Takeshi Yoshimura<sup>2</sup>  
<sup>1</sup>*University of Science and Technology of China, China;* <sup>2</sup>*Waseda University, Japan;*  
<sup>3</sup>*Waseda University and Shanghai Jiao Tong University Electronic Engineering, China*
- B6P-Q.2 A Partial Redundant Fault-Secure High-Level Synthesis Algorithm for RDR Architectures .....1736**  
Kazushi Kawamura, Sho Tanaka, Masao Yanagisawa, Nozomu Togawa  
*Waseda University, Japan*
- B6P-Q.3 Automatic Verification of Transition Systems with Unspecified Components .....1740**  
Mo Xia, Ming Jin, Guiming Luo  
*Tsinghua University, China*
- B6P-Q.4 Mobility Overlap-Removal Based Leakage Power Aware Scheduling in High-Level Synthesis .....1745**  
Nan Wang<sup>2</sup>, Song Chen<sup>1</sup>, Yuhuan Sun<sup>2</sup>, Takeshi Yoshimura<sup>2</sup>  
<sup>1</sup>*University of Science and Technology of China, China;* <sup>2</sup>*Waseda University, Japan*
- B6P-Q.5 Efficient Middleware for Network Evaluation and Optimization in Wireless Sensor Network Design .....1749**  
Yujie Liang, Rendong Ying, Peilin Liu  
*Shanghai Jiao Tong University, China*

**B6P-R: Oscillators and PLLs**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chair: Elena Blokhina, *University College Dublin*

---

- B6P-R.1**     **An Efficient Method to Compute Phase-Noise in Injection-Locked Frequency Dividers** .....1753  
Giovanni Marucci, Salvatore Levantino, Paolo Maffezzoni, Carlo Samori  
*Politecnico di Milano, Italy*
- B6P-R.2**     **A 47 $\mu$ W 204MHz AIN Contour-Mode MEMS Based Tunable Oscillator in 65nm CMOS**.....1757  
Xiaotie Wu, Chengjie Zuo, Milin Zhang, Jan Van der Spiegel, Gianluca Piazza  
*University of Pennsylvania, United States*
- B6P-R.3**     **Bang-Bang Phase Detector Model Revisited**.....1761  
Carlos Sánchez-Azqueta, Cecilia Gimeno, Concepcion Aldea, Santiago Celma, Cristina Azcona  
*Universidad de Zaragoza, Spain*
- B6P-R.4**     **A Mismatch-Robust Period-Based VCO Frequency Comparison Technique for ULP Receivers** .....1765  
Shahaboddin Moazzeni<sup>1</sup>, Glenn Cowan<sup>1</sup>, Mohamad Sawan<sup>2</sup>  
<sup>1</sup>*Concordia University, Canada*; <sup>2</sup>*École Polytechnique de Montréal, Canada*

**B6P-S: Oscillations, Nonlinear Dynamics & Synchronization**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chair: Yoshifumi Nishio, *Tokushima University*

---

- B6P-S.2 Simulating the Synchronization of Multi-Scroll Chaotic Oscillators .....1773**  
Victor Hugo Carbajal-Gómez<sup>2</sup>, Esteban Tlelo-Cuautle<sup>2</sup>, Rodolfo Trejo-Guerra<sup>3</sup>,  
Jesus Manuel Muñoz-Pacheco<sup>1</sup>  
<sup>1</sup>*Benemérita Universidad Autónoma de Puebla, Mexico*; <sup>2</sup>*INAOE, Mexico*;  
<sup>3</sup>*SEMTECH/Snowbush, Mexico*
- B6P-S.3 On Oscillatory Dynamics of Small-RNAs-Mediated Two-Gene Regulatory  
Networks .....1777**  
Min Xiao<sup>1</sup>, Wei Xing Zheng<sup>2</sup>  
<sup>1</sup>*Nanjing Xiaozhuang University, China*; <sup>2</sup>*University of Western Sydney, Australia*
- B6P-S.4 Frustrated Synchronization in Two Coupled Polygonal Oscillatory Networks .....1781**  
Yoko Uwate, Yoshifumi Nishio  
*Tokushima University, Japan*
- B6P-S.5 Ultra-Low-Power 2.4 GHz Colpitts Oscillator Based on Double Feedback  
Technique .....1785**  
Rodrigo Eduardo Rottava<sup>2</sup>, Carlyle Câmara S. Jr. }, Fernando Rangel de Sousa<sup>2</sup>,  
Robson Nunes de Lima<sup>1</sup>  
<sup>1</sup>*Universidade Federal da Bahia, Brazil*; <sup>2</sup>*Universidade Federal de Santa Catarina,  
Brazil*

**B6P-T: Programmable & Reconfigurable Architectures II**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Mohsin Jamali, *The University of Toledo*  
Seokbum Ko, *University of Saskatchewan*

---

- B6P-T.1**      **A Multilevel Fingerprinting Method for FPGA IP Protection .....1789**  
Tingyuan Nie<sup>2</sup>, Yansheng Li<sup>2</sup>, Li Lijian Zhou<sup>2</sup>, Masahiko Toyonaga<sup>1</sup>  
*<sup>1</sup>Kochi University, Japan; <sup>2</sup>Qingdao Technological University, China*
- B6P-T.2**      **A VLSI Architecture for Enhancing the Fault Tolerance of NoC Using Quad-Spare Mesh Topology and Dynamic Reconfiguration .....1793**  
Yu Ren<sup>1</sup>, Leibo Liu<sup>1</sup>, Shouyi Yin<sup>1</sup>, Qinghua Wu<sup>1</sup>, Shaojun Wei<sup>1</sup>, Jie Han<sup>2</sup>  
*<sup>1</sup>Tsinghua University, China; <sup>2</sup>University of Alberta, Canada*
- B6P-T.3**      **A Fast Cam-Based Image Matching System on FPGA .....1797**  
Duc-Hung Le<sup>2</sup>, Tran-Bao-Thuong Cao<sup>3</sup>, Katsumi Inoue<sup>1</sup>, Cong-Kha Pham<sup>2</sup>  
*<sup>1</sup>Advanced Original Technologies, Japan; <sup>2</sup>University of Electro-Communications Tokyo, Japan; <sup>3</sup>University of Science Ho Chi Minh City, Vietnam*
- B6P-T.4**      **A High Speed Configurable FPGA Architecture for K-Mean Clustering .....1801**  
Jithin Sankar Sankaran Kutty<sup>2</sup>, Farid Boussaid<sup>2</sup>, Abbas Amira<sup>1</sup>  
*<sup>1</sup>Qatar University, Qatar; <sup>2</sup>University of Western Australia, Australia*

**B6P-U: Sensory Systems**

Time: Tuesday, May 21, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Khaled Salama, *King Abdullah Univ. of Science & Technology*  
Shoushen Chen, *Nanyang Technological University*

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- B6P-U.1 Compressed Sensing SAR Moving Target Imaging in the Presence of Basis Mismatch.....1809**  
Ahmed Khwaja, Xiao-Ping Zhang  
*Ryerson University, Canada*
- B6P-U.2 Sigma Delta Feedback DAC Architectures for High Accuracy and Extremely Low Charge Transfer.....1813**  
Ketan Pol<sup>1</sup>, Hans Hegt<sup>1</sup>, Sotir Ouzounov<sup>2</sup>  
<sup>1</sup>*Eindhoven University of Technology, Netherlands*; <sup>2</sup>*Philips Research, Netherlands*
- B6P-U.3 An Ultra-Low-Power Voltage-Mode Asynchronous WTA-LTA Circuit.....1817**  
Jorge Fernández-Berni, Ricardo Carmona-Galán, Ángel Rodríguez-Vázquez  
*CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain*
- B6P-U.4 A Low-Power Wide-Dynamic-Range Readout IC for Breath Analyzer System.....1821**  
Yingkan Lin, Perena Gouma, Milutin Stanacevic  
*Stony Brook University, United States*
- B6P-U.5 Link and Energy Adaptive UWB-Based Embedded Sensing with Renewable Energy .....1825**  
Junlin Chen, Dong Zhao, Lei Wang  
*University of Connecticut, United States*

**B7P-N: Amplifiers and Filters**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chair: Albert Wang, *University of California, Riverside*

---

- B7P-N.1 Slew-Rate Enhancement for a Single-Ended Low-Power Two-Stage Amplifier .....1829**  
Hossein Kassiri Bidhendi<sup>2</sup>, M. Jamal Deen<sup>1</sup>  
*<sup>1</sup>McMaster University, Canada; <sup>2</sup>University of Toronto, Canada*
- B7P-N.2 A 0.3mm<sup>2</sup> 10-b 100MS/s Pipelined ADC Using Nauta Structure Op-Amps in 180nm CMOS .....1833**  
Andrew Nicholson<sup>2</sup>, Julian Jenkins<sup>1</sup>, Astria Nur Irfansyah<sup>2</sup>, Nonie Politi<sup>2</sup>, André van Schaik<sup>3</sup>, Tara Hamilton<sup>2</sup>, Torsten Lehmann<sup>2</sup>  
*<sup>1</sup>Perceptia Devices Inc., Australia; <sup>2</sup>University of New South Wales, Australia; <sup>3</sup>University of Western Sydney, Australia*
- B7P-N.4 A Switched-Capacitor Biquad Using a Simple Quasi-Unity Gain Amplifier.....1841**  
Hugo Serra<sup>1</sup>, Nuno Paulino<sup>1</sup>, Joao Goes<sup>2</sup>  
*<sup>1</sup>UNINOVA/CTS - Universidade Nova de Lisboa, Portugal; <sup>2</sup>Universidade Nova de Lisboa, Portugal*
- B7P-N.5 A Multi-Mode Complex Bandpass Filter with gm-Assisted Power Optimization and I/Q Calibration .....1845**  
Nan Qi<sup>1</sup>, Zheng Song<sup>1</sup>, Baoyong Chi<sup>1</sup>, Albert Wang<sup>2</sup>, Tianling Ren<sup>1</sup>, Zhihua Wang<sup>1</sup>  
*<sup>1</sup>Tsinghua University, China; <sup>2</sup>University of California, Riverside, China*



**B7P-P: Wireless Circuits Poster**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chair: Jorge Fernandes, *Instituto Superior Técnico*

---

- B7P-P.1 A Low-Noise Amplifier with Continuously-Tuned Input Matching Frequency and Output Resonance Frequency .....1849**  
Xi Zhu<sup>2</sup>, Chirn Chye Boon<sup>2</sup>, Ayobami Iji<sup>1</sup>, Yichuang Sun<sup>3</sup>, Michael Heimlich<sup>1</sup>  
<sup>1</sup>Macquarie University, Australia; <sup>2</sup>Nanyang Technological University, Singapore;  
<sup>3</sup>University of Hertfordshire, United Kingdom
- B7P-P.2 An LNA with Optimally Mismatched Antenna Interface for Energy Harvesting Sensor Nodes .....1853**  
Yao Liu, Wouter A. Serdijn  
*Delft University of Technology, Netherlands*
- B7P-P.3 Energy Detection Technique for Ultra-Low Power High Sensitivity Wake-Up Receiver .....1857**  
Wenting Zhou, Jan Rabaey  
*University of California, Berkeley, United States*
- B7P-P.4 Ring-VCO Based Low Noise and Low Spur Frequency Synthesizer.....1861**  
Tewen Liao, Jun-Ren Su, Chung-Chih Hung  
*National Chiao Tung University, Taiwan*
- B7P-P.5 Time Domain Probe Insertion to Find Steady State of Strongly Nonlinear High-Q Oscillators .....1865**  
Federico Bizzarri, Angelo Maurizio Brambilla, Giambattista Grusso, Giancarlo Storti Gajani  
*Politecnico di Milano, Italy*

**B7P-Q: Neural Circuit Technologies**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chairs: Timothy Constandinou, *Imperial College London*  
Wouter Serdijn, *Delft University of Technology*

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- B7P-Q.1 A Reconfigurable Architecture for Real-Time Prediction of Neural Activity .....1869**  
Will Li<sup>1</sup>, Ray Cheung<sup>1</sup>, Rosa Chan<sup>1</sup>, Dong Song<sup>2</sup>, Theodore Berger<sup>2</sup>  
<sup>1</sup>*City University of Hong Kong, Hong Kong*; <sup>2</sup>*University of Southern California, United States*
- B7P-Q.2 A 16-Channel Neural Stimulator with DAC Sharing Scheme for Visual Prostheses...1873**  
Kyomuk Lim, Jindeok Seo, Changho Seok, Hyoungko Ko  
*Chungnam National University, Korea, South*
- B7P-Q.3 A Switched-Mode Multichannel Neural Stimulator with a Minimum Number of External Components .....1877**  
Marijn van Dongen, Wouter A. Serdijn  
*Delft University of Technology, Netherlands*
- B7P-Q.4 Design of an Implantable Stimulator ASIC with Self-Adapting Supply .....1881**  
Xiao Liu<sup>1</sup>, Andreas Demosthenous<sup>2</sup>, Dai Jiang<sup>2</sup>, Nick Donaldson<sup>2</sup>  
<sup>1</sup>*Brunel University, United Kingdom*; <sup>2</sup>*University College London, United Kingdom*
- B7P-Q.5 A Flexible Biphasic Pulse Generating and Accurate Charge Balancing Stimulator with a 1 $\mu$ W Neural Recording Amplifier .....1885**  
Hosung Chun, Omid Kavehei, Nhan Tran, Stan Skafidas  
*University of Melbourne, Australia*

**B7P-R: Biomedical Technologies**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chair: Yong Lian, *National University of Singapore*

---

- B7P-R.1**      **A Novel Hardware Implementation for Joint Heart Rate, Respiration Rate, and Gait Analysis Applied to Body Area Networks.....1889**  
Moein Khazraee, Ali Reza Zamani, Mohammad Hallajian, Pooya Ehsani, Hadi Asghari Moghaddam, Alireza Parsafar, Mahdi Shabany  
*Sharif University of Technology, Iran*
- B7P-R.2**      **VLSI Implementation of Real-Time Motion Compensated Beamforming in Synthetic Transmit Aperture Imaging .....1893**  
Kuan-Yu Ho, Yu-Hao Chen, Cheng-Zhou Zhan, An-Yeu Wu  
*National Taiwan University, Taiwan*
- B7P-R.3**      **A Study of the Partitioned Dynamic Programming Algorithm for Genome Comparison in FPGA .....1897**  
Yuanqi Hu, Pantelis Georgiou  
*Imperial College London, United Kingdom*
- B7P-R.4**      **An Updated Cardiovascular Simulation Toolbox.....1901**  
Gabriela Ortiz-León, Marta Vilchez-Monge, Juan J. Montero-Rodríguez  
*Instituto Tecnológico de Costa Rica, Costa Rica*
- B7P-R.5**      **Digital Microfluidic System:A New Design for Heterogeneous Sample Based Integration of Multiple DMFBs .....1905**  
Pranab Roy<sup>1</sup>, Mahua Raha Patra<sup>1</sup>, Hafizur Rahaman<sup>1</sup>, Parthasarathi Dasgupta<sup>2</sup>  
<sup>1</sup>*Bengal Engineering and Science University, India;* <sup>2</sup>*Indian Institute of Management Calcutta, India*

**B7P-S: Biomedical Circuit Technologies**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chair: George Yuan, *Hong Kong University of Science & Technology*

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- B7P-S.1**     **A Remotely Powered Multi Frequency RFID Sensing Tag with Integrated Impedance Measurement Interface .....1910**  
Martin Wiessflecker<sup>2</sup>, Günter Hofer<sup>2</sup>, Hannes Reinisch<sup>2</sup>, Stefan Gruber<sup>2</sup>, Gerald Holweg<sup>2</sup>, Walther Pachler<sup>1</sup>, Michael Klamming<sup>1</sup>, Wolfgang Pribyl<sup>1</sup>  
<sup>1</sup>*Graz University of Technology, Austria;* <sup>2</sup>*Infineon Technologies Austria AG, Austria*
- B7P-S.2**     **Micro-Watt Inductorless gm-Boost LNA for Biomedical Implants.....1914**  
Farhad Goodarzy, Behnam Sedighi, Stan Skafidas  
*University of Melbourne, Australia*
- B7P-S.3**     **A Variable Bandwidth Amplifier for a Dual-Mode Low-Power Delta-Sigma Modulator in Cardiac Pacemaker System .....1918**  
Ali Fazli Yeknami, Atila Alvandpour  
*Linköping University, Sweden*
- B7P-S.4**     **A 1.5  $\mu$ W NEO-Based Spike Detector with Adaptive-Threshold for Calibration-Free Multichannel Neural Interfaces.....1922**  
Ermis Koutsos, Sivylla Paraskevopoulou, Timothy Constandinou  
*Imperial College London, United Kingdom*
- B7P-S.5**     **A Low-Power Noise Scalable Instrumentation Amplifier for Fetal Monitoring Applications .....1926**  
Shuang Song, Michiel Rooijackers, Chiara Rabotti, Massimo Mischi, Arthur van Roermund, Eugenio Cantatore  
*Eindhoven University of Technology, Netherlands*

**B7P-T: Wireless Communications**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chair: Kai Zhang, *Analog Devices*

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- B7P-T.1 Low-Effort High-Performance Viterbi-Based Receiver for Bluetooth LE Applications .....1930**  
Ye Zhang, Zhimiao Chen, Ralf Wunderlich, Stefan Heinen  
*RWTH Aachen University, Germany*
- B7P-T.2 Low-Power Programmable Charge-Domain Sampler with Embedded N-Path Bandpass Filter for Software-Defined Radio .....1934**  
Yushi Zhou<sup>2</sup>, Norm Filiol<sup>1</sup>, Shaul Peker<sup>2</sup>, Fei Yuan<sup>2</sup>  
<sup>1</sup>*Kaben Wireless Silicon Inc., Canada*; <sup>2</sup>*Ryerson University, Canada*
- B7P-T.3 Log-Likelihood Ratio Algorithm for Rate Compatible Modulation .....1938**  
Wengui Rao, Yan Dong, Fang Lu, Shu Wang  
*Huazhong University of Science and Technology, China*
- B7P-T.4 A Novel Method to Design Wideband Power Amplifier for Wireless Communication .....1942**  
Ramazan Köprü<sup>1</sup>, Hakan Kuntman<sup>2</sup>, Bekir Sýddýk Yarman<sup>3</sup>  
<sup>1</sup>*Isik University, Istanbul Technical University, Turkey*; <sup>2</sup>*Istanbul Technical University, Turkey*; <sup>3</sup>*Istanbul University, Turkey*
- B7P-T.5 New Blind Multiuser Detection DS-CDMA Algorithm Using Simplified Fourth Order Cumulant Matrices .....1946**  
Zaid Albataineh, Fathi Salem  
*Michigan State University, United States*

**B7P-U: Circuits and Systems for Communication III**

Time: Tuesday, May 21, 2013, 14:30 - 16:00

Room: Poster Area

Chair: Neo Li, *IBM*

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- B7P-U.1 A 100Gb/s Quad-Rate Transformer-Coupled Injection-Locking CDR Circuit in 65nm CMOS .....1950**  
Fan-Ta Chen<sup>1</sup>, Jen-Ming Wu<sup>1</sup>, Yi-Chun Liu<sup>1</sup>, Mau-Chung Chang<sup>2</sup>  
*<sup>1</sup>National Tsing Hua University, Taiwan; <sup>2</sup>University of California, Los Angeles, United States*
- B7P-U.2 Electromagnetic Analysis on Ring Oscillator-Based True Random Number Generators .....1954**  
Pierre Bayon, Lilian Bossuet, Alain Aubert, Viktor Fischer  
*Laboratoire Hubert Curien, Slovakia*
- B7P-U.3 An Improved Push-Pull Driver Using 0.13 $\mu$ m CMOS .....1958**  
Ke Li, Peter Wilson  
*University of Southampton, United Kingdom*
- B7P-U.4 Low Complexity LFSR Based Bit-Serial Montgomery Multiplier in GF(2<sup>m</sup>) .....1962**  
Huapeng Wu  
*University of Windsor, Canada*
- B7P-U.5 Compressive Modulation in Digital Communication .....1966**  
Yingyu Li, Guangming Shi, Xuemei Xie, Chongyu Chen  
*Xidian University, China*

**B8P-N: Data Convertors & Regulators**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Poster Area

Chair: Wouter Serdijn, *Delft University of Technology*

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- B8P-N.1 Experimental Results on Wideband Spectrum Sensing Using Random Sampling ADC in 90nm CMOS .....1970**  
Robert D'Angelo<sup>2</sup>, Michael Trakimas<sup>1</sup>, Shuchin Aeron<sup>2</sup>, Sameer Sonkusale<sup>2</sup>  
<sup>1</sup>*International Rectifier, United States*; <sup>2</sup>*Tufts University, United States*
- B8P-N.2 A High Resolution and High Accuracy R-2R DAC Based on Ordered Element Matching.....1974**  
You Li, Tao Zeng, Degang Chen  
*Iowa State University, United States*
- B8P-N.3 A Novel Energy-Efficient Serializer Design Method for Gigascale Systems .....1978**  
Kejun Wu<sup>2</sup>, Peng Liu<sup>2</sup>, Qiaoyan Yu<sup>1</sup>  
<sup>1</sup>*University of New Hampshire, United States*; <sup>2</sup>*Zhejiang University, China*
- B8P-N.4 A Low-Power 0.5V Regulator with Settling Enhancement for Wireless Sensor Nodes .....1982**  
Fu-Chun Wen, Hung-Sheng Hsu, Zhi-Hao Hong, Yu-Te Liao  
*National Chung Cheng University, Taiwan*
- B8P-N.5 A 1.2V 10-bit 5 MS/s CMOS Cyclic ADC .....1986**  
Chi-Chang Lu  
*National Formosa University, Taiwan*

**B8P-P: Delta-Sigma Modulators II**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Poster Area

Chair: Jose M. de la Rosa, *Instituto de Microelectrónica de Sevilla*

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- B8P-P.1 Low Power Quantizer Design in CT Delta Sigma Modulators .....1990**  
John G. Kauffman, Rudolf Ritter, Chao Chu, Joachim Becker, Maurits Ortmanns  
*Universität Ulm, Germany*
- B8P-P.2 Undersampling RF-to-Digital CT Sigma-Delta Modulator with Tunable Notch  
Frequency and Simplified Raised-Cosine FIR Feedback DAC.....1994**  
Sohail Asghar, Rocío Del Río, José M. de la Rosa  
*CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain*
- B8P-P.3 A 1.96-mW, 2.6-MHz Bandwidth Discrete Time Quadrature Band-Pass Sigma-  
Delta Modulator .....1998**  
Nithin Kumar Y.B. }, Hervé Caracciolo<sup>2</sup>, Edoardo Bonizzoni<sup>2</sup>, Amit Patra<sup>1</sup>, Franco  
Maloberti<sup>2</sup>  
<sup>1</sup>*Indian Institute of Technology Kharagpur, India;* <sup>2</sup>*Università degli Studi di Pavia, Italy*
- B8P-P.4 A 3rd-Order Delta-Sigma Modulator with Timing-Sharing Opamp-Sharing  
Technique .....2002**  
I-Jen Chao<sup>1</sup>, Chia-Ming Kuo<sup>1</sup>, Bin-Da Liu<sup>1</sup>, Chun-Yueh Huang<sup>2</sup>, Soon-Jyh Chang<sup>1</sup>  
<sup>1</sup>*National Cheng Kung University, Taiwan;* <sup>2</sup>*National University of Tainan, Taiwan*
- B8P-P.5 A 10MHz-Bw, 5.6mW, 70dB SNDR Delta-Sigma ADC Using VCO-Based  
Integrators with Intrinsic DEM .....2006**  
Kyoungtae Lee, Yeonam Yoon, Nan Sun  
*University of Texas at Austin, United States*



**B8P-Q: Data Convertors III**

Time: Tuesday, May 21, 2013, 16:20 - 17:50  
Room: Poster Area  
Chair: João Goes, *Universidade Nova de Lisboa*

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- B8P-Q.1 A 0.5-V 250-nW 65-dB SNDR Passive Delta-Sigma Modulator for Medical Implant Devices.....2010**  
Ali Fazli Yeknami, Atila Alvandpour  
*Linköping University, Sweden*
- B8P-Q.2 A Split-Capacitor Vcm-Based Capacitor-Switching Scheme for Low-Power SAR ADCs.....2014**  
Yue Wu, Xu Cheng, Xiaoyang Zeng  
*Fudan University, China*
- B8P-Q.3 A 5-bit 1.25Gs/s 4.7mW Delay-Based Pipelined ADC in 65nm CMOS .....2018**  
Ali Mesgarani<sup>3</sup>, Haipeng Fu<sup>2</sup>, Mei Yan<sup>2</sup>, Ahmet Tekin<sup>1</sup>, Hao Yu<sup>2</sup>, Suat Ay<sup>3</sup>  
<sup>1</sup>*Broadcom Corporation, United States*; <sup>2</sup>*Nanyang Technological University, Singapore*; <sup>3</sup>*University of Idaho, United States*
- B8P-Q.4 Analysis and Design of High Performance Frequency-Interleaved ADC.....2022**  
Lei Qiu, Yuanjin Zheng, Liter Siek  
*Nanyang Technological University, Singapore*
- B8P-Q.5 Integrator Swing Reduction in Feedback Compensated Sigma-Delta Modulators .....2026**  
Rudolf Ritter, John G. Kauffman, Matthias Lorenz, Maurits Ortmanns  
*Universität Ulm, Germany*

**B8P-R: Data Converters IV**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Poster Area

Chair: George Yuan, *Hong Kong University of Science & Technology*

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- B8P-R.1 A 0.5V Rate-Resolution Scalable SAR ADC with 63.7dB SFDR .....2030**  
Hai Huang, Kun Ao, Zhiyong Guo, Qiang Li  
*University of Electronic Science and Technology of China, China*
- B8P-R.2 A 10-bit Current-Steering DAC for HomePlug AV2 Powerline Communication System in 90nm CMOS .....2034**  
Wei-Sheng Cheng, Min-Han Hsieh, Shuo-Hong Hung, Szu-Yao Hung, Charlie Chung-Ping Chen  
*National Taiwan University, Taiwan*
- B8P-R.3 A 15-bit Two-Step Sigma-Delta ADC with Embedded Compression for Image Sensor Array .....2038**  
Mengyun Yue, Dong Wu, Zheyao Wang  
*Tsinghua University, China*
- B8P-R.4 A 1.5-bit/Stage Pipeline ADC with FFT-Based Calibration Method.....2042**  
Ming-Chun Liang, Cheng-Hen Hsieh, Shuenn-Yuh Lee  
*National Chung Cheng University, Taiwan*
- B8P-R.5 A Low Power 10bit 500kS/s Delta-Modulated SAR ADC (DMSAR ADC) for Implantable Medical Devices.....2046**  
Yuan-Fu Lyu, Chung-Yu Wu, Li Chen Liu, Wei-Ming Chen  
*National Chiao Tung University, Taiwan*

**B8P-S: DSP Implementation and Embedded Systems**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Poster Area

Chairs: Mrityunjoy Chakraborty, *Indian Institute of Technology, Kharagpur*  
Izzet Kale, *University of Westminster*

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|                |   |             |
|----------------|---|-------------|
| <b>B8P-S.1</b> | <b>A Novel FIR Filter Based on Stochastic Logic .....</b>   | <b>2050</b> |
|                | Jienan Chen, Jianhao Hu<br><i>University of Electronic Science and Technology of China, China</i>           |             |
| <b>B8P-S.2</b> | <b>Partial LUT Size Analysis in Distributed Arithmetic FIR Filters on FPGAs.....</b>                        | <b>2054</b> |
|                | Martin Kumm, Konrad Möller, Peter Zipf<br><i>University of Kassel, Germany</i>                              |             |
| <b>B8P-S.3</b> | <b>Reconfigurable FIR Filter Using Distributed Arithmetic on FPGAs.....</b>                                 | <b>2058</b> |
|                | Martin Kumm, Konrad Möller, Peter Zipf<br><i>University of Kassel, Germany</i>                              |             |
| <b>B8P-S.4</b> | <b>A VLSI DBSCAN Processor Composed as an Array of Micro Agents Having Self-Growing Interconnects .....</b> | <b>2062</b> |
|                | Atsushi Shimada, Hongbo Zhu, Tadashi Shibata<br><i>University of Tokyo, Japan</i>                           |             |
| <b>B8P-S.5</b> | <b>A Reconfigurable FFT Architecture for Variable-Length and Multi-Streaming OFDM Standards .....</b>       | <b>2066</b> |
|                | Padma Prasad Boopal, Mario Garrido, Oscar Gustafsson<br><i>Linköping University, Sweden</i>                 |             |
| <b>B8P-S.6</b> | <b>Hardware-fault attack handling in RNS-based Montgomery Multipliers .....</b>                             | <b>3042</b> |
|                | Dimitrios Schinianakis, Thanos Stouraitis<br><i>University of Patras, Greece</i>                            |             |

**B8P-T: Nano devices and Circuit applications**

Time: Tuesday, May 21, 2013, 16:20 - 17:50

Room: Poster Area

Chair: Sorin Cotofana, *Delft University*

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- B8P-T.1 A Floating Gate Graphene FET Complementary Inverter with Symmetrical Transfer Characteristics .....2071**  
Ime Umoh, Tom Kazmierski  
*University of Southampton, United Kingdom*
- B8P-T.2 Power Analysis Attack of QCA Circuits: a Case Study of the Serpent Cipher.....2075**  
Weiqiang Liu<sup>2</sup>, Saket Srivastava<sup>1</sup>, Liang Lu<sup>2</sup>, Maire O'Neill<sup>2</sup>, Earl Swartzlander Jr.  
}  
<sup>1</sup>*Indraprastha Institute of Information Technology, India*; <sup>2</sup>*Queen's University Belfast, United Kingdom*; <sup>3</sup>*University of Texas at Austin, United States*
- B8P-T.3 A High-Speed 2xVDD Output Buffer with PVT Detection Using 40-nm CMOS Technology .....2079**  
Chua-Chin Wang, Wen-Je Lu, Hsin-Yuan Tseng  
*National Sun Yat-Sen University, Taiwan*
- B8P-T.4 A Monitoring Circuit for NBTI Degradation at 65nm Technology Node .....2083**  
Yandong He, Jie Hong, Ganggang Zhang, Lin Han, Xing Zhang  
*Peking University, China*
- B8P-T.5 3.5-D Integration: a Case Study .....2087**  
Shashikanth Bobba<sup>1</sup>, Pierre-Emmanuel Gaillardon<sup>1</sup>, Ciprian Seiculescu<sup>1</sup>, Vasilis F. Pavlidis<sup>2</sup>, Giovanni De Micheli<sup>1</sup>  
<sup>1</sup>*École Polytechnique Fédérale de Lausanne, Switzerland*; <sup>2</sup>*University of Manchester, United Kingdom*

**C1L-A: Theoretical Advances in Neural Networks and Systems I**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 301A

Chairs: Weixing Zheng, *University of Western Sydney*  
Wenwu Yu, *Southeast University*

---

- C1L-A.1 A Forward Step for Adaptive Synchronization in Directed Complex Networks .....2091**  
Wenwu Yu<sup>2</sup>, Xinghuo Yu<sup>1</sup>  
*<sup>1</sup>MIT University, Australia; <sup>2</sup>Southeast University, China*
- C1L-A.2 Convergence Analysis of Continuous-Time Systems Based on Feedforward Neural Networks .....2095**  
Yuzhu Huang, Derong Liu, Qinglai Wei  
*Chinese Academy of Sciences, China*
- C1L-A.3 Stability Analysis of Multiple Equilibria for Recurrent Neural Networks with Time-Varying Delays.....2099**  
Zhigang Zeng<sup>1</sup>, Wei Xing Zheng<sup>2</sup>  
*<sup>1</sup>Huazhong University of Science and Technology, China; <sup>2</sup>University of Western Sydney, Australia*
- C1L-A.4 Hybrid Modelling of the General Middle-Sized Genetic Regulatory Networks .....2103**  
Pei Wang<sup>3</sup>, Renquan Lu<sup>2</sup>, Yao Chen<sup>1</sup>, Xiaoqun Wu<sup>4</sup>  
*<sup>1</sup>Beijing Jiaotong University, China; <sup>2</sup>Hangzhou Dianzi University, China; <sup>3</sup>Henan University, China; <sup>4</sup>Wuhan University, China*
- C1L-A.5 Multi-Layer Perceptron Including Glial Pulse and Switching Between Learning and Non-Learning.....2107**  
Chihiro Ikuta<sup>1</sup>, Yoko Uwate<sup>1</sup>, Yoshifumi Nishio<sup>1</sup>, Guoan Yang<sup>2</sup>  
*<sup>1</sup>Tokushima University, Japan; <sup>2</sup>Xi'an Jiaotong University, China*

**C1L-B:**        **Novel Nano Device and it's Circuit Application**  
Time:            Wednesday, May 22, 2013, 09:40 - 11:10  
Room:           Room 301B  
Chair:           Malgorzata Chrzanowska-Jeske, *Portland State University*

---

- C1L-B.1**        **Dual-Threshold-Voltage Configurable Circuits with Three-Independent-Gate Silicon Nanowire FETs.....2111**  
Jian Zhang, Pierre-Emmanuel Gaillardon, Giovanni De Micheli  
*École Polytechnique Fédérale de Lausanne, Switzerland*
- C1L-B.3**        **Low-Power and Compact NP Dynamic CMOS Adder with 16nm Carbon Nanotube Transistors.....2119**  
Yanan Sun, Volkan Kursun  
*Hong Kong University of Science and Technology, China*
- C1L-B.4**        **CNTFET 8T SRAM Cell Performance with Near-Threshold Power Supply Scaling.....2123**  
Zhe Zhang, José Delgado-Frias  
*Washington State University, United States*
- C1L-B.5**        **Self-Checking Ripple-Carry Adder with Ambipolar Silicon Nanowire FET .....2127**  
Ogun Turkyilmaz<sup>1</sup>, Fabien Clermidy<sup>1</sup>, Luca Amarù<sup>2</sup>, Pierre-Emmanuel Gaillardon<sup>2</sup>, Giovanni De Micheli<sup>2</sup>  
<sup>1</sup>CEA LETI, France; <sup>2</sup>École Polytechnique Fédérale de Lausanne, Switzerland

**C1L-C: Visual Recognition and Processing I**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 302A

Chairs: Lap-Pui Chau, *Nanyang Technological University, Singapore*  
Junsong Yuan, *Nanyang Technological University*

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- C1L-C.1 A Two-Stage Low Complexity Face Recognition System for Face Images with Alignment Errors .....2131**  
Ching-Yao Su, Jar-Ferr Yang  
*National Cheng Kung University, Taiwan*
- C1L-C.2 A Highly Effective Error Concealment Method for Whole Frame Loss .....2135**  
Chen Zhao, Siwei Ma, Jian Zhang, Wen Gao  
*Peking University, China*
- C1L-C.3 Rain Removal from Dynamic Scene Based on Motion Segmentation .....2139**  
Jie Chen, Lap-Pui Chau  
*Nanyang Technological University, Singapore*
- C1L-C.4 Adaptive General Scale Interpolation Based on Similar Pixels Weighting.....2143**  
Mading Li, Jiaying Liu, Jie Ren, Zongming Guo  
*Peking University, China*
- C1L-C.5 Underwater Optical Image Dehazing Using Guided Trigonometric Bilateral Filtering .....2147**  
Huimin Lu, Yujie Li, Lifeng Zhang, Akira Yamawaki, Shiyuan Yang, Seiichi Serikawa  
*Kyushu Institute of Technology, Japan*

**C1L-D: MIMO Communication Systems**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 302B

Chair: Jongsun Park, *Korea University*

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- C1L-D.1 High-Throughput Hardware-Efficient Soft-Input Soft-Output MIMO Detector for Iterative Receivers.....2151**  
Liang Liu  
*Lund University, Sweden*
- C1L-D.2 Approximate Matrix Inversion for High-Throughput Data Detection in the Large-Scale MIMO Uplink .....2155**  
Michael Wu<sup>1</sup>, Bei Yin<sup>1</sup>, Aida Vosoughi<sup>1</sup>, Christoph Studer<sup>1</sup>, Joseph R. Cavallaro<sup>1</sup>, Chris Dick<sup>2</sup>  
<sup>1</sup>*Rice University, United States*; <sup>2</sup>*Xilinx, United States*
- C1L-D.3 Multidimensional Householder Based High-Speed QR Decomposition Architecture for MIMO Receivers.....2159**  
Ipud Heri Kurniawan, Ji-Hwan Yoon, Jongsun Park  
*Korea University, Korea, South*
- C1L-D.4 Low-Complexity Decision Directed Method for Carrier Frequency Offset Estimation of IEEE 802.11ad .....2163**  
Junghyun Ha, Janghyuk Yoon, Ik-Joon Chang, Jinsang Kim  
*Kyung Hee University, Korea, South*
- C1L-D.5 VLSI Implementation of a Low Complexity 4x4 MIMO Sphere Decoder with Table Enumeration .....2167**  
Kai-Jiun Yang<sup>2</sup>, Shang-Ho Tsai<sup>2</sup>, Rwei-Ching Chang<sup>2</sup>, Yan-Cheng Chen<sup>2</sup>, Gene C.-H. Chuang<sup>1</sup>  
<sup>1</sup>*Information and Communications Research Laboratories, Industrial Technology Research Institute, Taiwan*; <sup>2</sup>*National Chiao Tung University, Taiwan*



**C1L-E: Detection and Estimation**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 303A

Chairs: Behrouz Nowrouzian, *University of Alberta*

Shaikh Fattah, *Bangladesh University of Engineering and Technology*

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- C1L-E.1 Harmonic Signal Recovery and Order Estimation Based on Cascaded Sparse Processing .....2171**  
Lu Wang, Guoan Bi  
*Nanyang Technological University, Singapore*
- C1L-E.2 A Precedence Effect Based Far-Field DoA Estimation Algorithm .....2175**  
Wen-Sheng Chou, Tai-Shih Chi  
*National Chiao Tung University, Taiwan*
- C1L-E.3 Underwater Acoustic Blind Beamforming and Geolocation Using a Single Vector Hydrophone .....B#5**  
Jin He, M.N.S. Swamy, M. Omair Ahmad  
*Concordia University, Canada*
- C1L-E.4 An Approach for Joint Blind Space-Time Equalization and DOA Estimation .....2183**  
Iman Moazzen, Panajotis Agathoklis  
*University of Victoria, Canada*
- C1L-E.5 Sparse Linear Arrays for Estimating and Tracking DOAs of Signals with Known Waveforms .....2187**  
Jian-Feng Gu, Wei-Ping Zhu, M. N. S. Swamy  
*Concordia University, Canada*

**C1L-F: Neural, Radiation, and Self-Powered Sensors**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 303B

Chairs: Timothy Constandinou, *Imperial College London*  
Khaled Salama, *King Abdullah Univ. of Science & Technology*

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- C1L-F.1 A Low-Power Area-Efficient Compressive Sensing Approach for Multi-Channel Neural Recording .....2191**  
Mahsa Shoaran, Mariazel Maqueda Lopez, Vijaya Sankara Rao Pasupureddi, Yusuf Leblebici, Alexandre Schmid  
*École Polytechnique Fédérale de Lausanne, Switzerland*
- C1L-F.2 Noise Model of Indirect-Feedback Sigma-Delta Image Sensors .....2195**  
Zhe Gao<sup>2</sup>, John Liobe<sup>1</sup>, Zeljko Ignjatovic<sup>2</sup>, Mark Bocko<sup>2</sup>  
<sup>1</sup>ADVIS Inc., *United States*; <sup>2</sup>University of Rochester, *United States*
- C1L-F.3 Low-Noise Readout IC with Integrated Analog-to-Digital Conversion for Radiation Detection System .....2199**  
Yingkan Lin, Milutin Stanacevic  
*Stony Brook University, United States*
- C1L-F.4 Scavenging Thermal-Noise Energy for Implementing Long-Term Self-Powered CMOS Timers .....2203**  
Liang Zhou, Pikul Sarkar, Shantanu Chakrabartty  
*Michigan State University, United States*
- C1L-F.5 A Compressive Piezoelectric Front-End Circuit for Self-Powered Mechanical Impact Detectors .....2207**  
Pikul Sarkar, Shantanu Chakrabartty  
*Michigan State University, United States*

**C1L-G: Datapath & Arithmetic Circuits**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 305

Chairs: Magdy Bayoumi, *University of Louisiana at Lafayette*  
An-Yeu (Andy) Wu, *National Taiwan University*

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- C1L-G.1**     **A Signed Integer Programmable Power-of-Two Scaler for  $2^{2n-1}$ ,  $2^n$ ,  $2^{n+1}$  RNS .....2211**  
Jeremy Yung Shern Low, Thian Fatt Tay, Chip Hong Chang  
*Nanyang Technological University, Singapore*
- C1L-G.2**     **An Ultra-Fast Parallel Architecture Using Sequential Circuits Computing on Random Bits .....2215**  
Daran Cai, Ang Wang, Ge Song, Weikang Qian  
*Shanghai Jiao Tong University, China*
- C1L-G.3**     **Non-Iterative High Speed Division Computation Based on Mitchell Logarithmic Method.....2219**  
Joshua Yung Lih Low, Ching Chuen Jong  
*Nanyang Technological University, Singapore*
- C1L-G.4**     **Delay-Variation-Tolerant FIR Filter Architectures Based on the Residue Number System.....2223**  
Ioannis Kouretas, Vassilis Paliouras  
*University of Patras, Greece*
- C1L-G.5**     **High Performance 3D-FFT Implementation .....2227**  
Nidhi U, Kolin Paul, Ahmed Hemani, Anshul Kumar  
*Indian Institute of Technology Delhi, India*

**C1L-H: Sucessive Approximation ADCs**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 306A

Chairs: George Yuan, *Hong Kong University of Science & Technology*  
Shahriar Mirabbasi, *University of British Columbia*

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- C1L-H.1 The Swapping Binary-Window DAC Switching Technique for SAR ADCs .....2231**  
Yung-Hui Chung  
*National Taiwan University of Science and Technology, Taiwan*
- C1L-H.2 A Single SAR ADC Converting Multi-Channel Sparse Signals .....2235**  
Wenjuan Guo, Youngchun Kim, Arindam Sanyal, Ahmed Tewfik, Nan Sun  
*University of Texas at Austin, United States*
- C1L-H.3 A 0.6V 8B 100MS/s SAR ADC with Minimized DAC Capacitance and Switching Energy in 65nm CMOS .....2239**  
Wenlan Wu, Yan Zhu, Li Ding, Chi-Hang Chan, U-Fai Chio, Sai-Weng Sin, Seng-Pan U, Rui-Paulo Martins  
*Universidade de Macau, Macau*
- C1L-H.4 A SAR ADC with Energy-Efficient DAC and Tri-Level Switching Scheme .....2243**  
Kuan-Ting Lin, Kea-Tiong Tang  
*National Tsing Hua University, Taiwan*
- C1L-H.5 Analysis of Back-End Flash in a 1.5b/Stage Pipelined ADC .....2247**  
Manideep Gande, Jon Guerber, Un-Ku Moon  
*Oregon State University, United States*

**C1L-J: Nonlinear Circuits and Systems**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 306B

Chair: Sergio Callegari, *Università di Bologna*

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- C1L-J.1 Digitally Controlled Wide Range Pulse Width Modulator for on-Chip Power Supplies .....2251**  
Selcuk Köse<sup>2</sup>, Inna Vaisband<sup>1</sup>, Eby Friedman<sup>1</sup>  
<sup>1</sup>*University of Rochester, United States;* <sup>2</sup>*University of South Florida, United States*
- C1L-J.2 How to Reach 100% Coding Efficiency in Multilevel Burst-Mode RF Transmitters ....2255**  
Katharina Hausmair<sup>1</sup>, Shuli Chi<sup>1</sup>, Christian Vogel<sup>2</sup>  
<sup>1</sup>*Graz University of Technology, Austria;* <sup>2</sup>*Telecommunications Research Center Vienna, Austria*
- C1L-J.3 Accurate Time Domain Extraction of Supercapacitor Fractional-Order Model Parameters .....2259**  
Todd Freeborn<sup>1</sup>, Brent Maundy<sup>1</sup>, Ahmed Elwakil<sup>2</sup>  
<sup>1</sup>*University of Calgary, Canada;* <sup>2</sup>*University of Sharjah, U.A.E.*
- C1L-J.4 Coding Efficiency of Bandlimited PWM Based Burst-Mode RF Transmitters .....2263**  
Shuli Chi<sup>1</sup>, Katharina Hausmair<sup>1</sup>, Christian Vogel<sup>2</sup>  
<sup>1</sup>*Graz University of Technology, Austria;* <sup>2</sup>*Telecommunications Research Center Vienna, Austria*
- C1L-J.5 A Broadband Variable Gain Amplifier for the Square Kilometer Array .....2267**  
Ge Wu, Leonid Belostotski, Jim Haslett  
*University of Calgary, Canada*

**C1L-K: Implantable and Wearable Technology**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 307A

Chairs: Wouter Serdijn, *Delft University of Technology*  
Pantellis Georgiou, *Imperial College London*

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- C1L-K.1 A 890fJ/Bit UWB Transmitter for SOC Integration in High Bit-Rate Transcutaneous bio-Implants .....2271**  
Lieuwe Leene, Song Luan, Timothy Constandinou  
*Imperial College London, United Kingdom*
- C1L-K.2 A Statistical MAC Protocol for Heterogeneous-Traffic Human Body Communication .....2275**  
Hong Chen<sup>2</sup>, Zedong Nie<sup>2</sup>, Kamen Ivanov<sup>2</sup>, Lei Wang<sup>2</sup>, Ran Liu<sup>1</sup>  
<sup>1</sup>*Blekinge Institute of Technology, Sweden*; <sup>2</sup>*Shenzhen Institutes of Advanced Technology, The Shenzhen Key Laboratory for Low-cost Healthcare, China*
- C1L-K.3 An Efficiency-Enhanced Wireless Power Transfer System with Segmented Transmitting Coils for Endoscopic Capsule.....2279**  
Yadong Huang<sup>2</sup>, Jianfeng Wang<sup>1</sup>, Tianjia Sun<sup>2</sup>, Xiang Xie<sup>2</sup>, Guolin Li<sup>2</sup>, Yingke Gu<sup>2</sup>, Zhihua Wang<sup>2</sup>  
<sup>1</sup>*Beijing University of Posts and Telecommunications, China*; <sup>2</sup>*Tsinghua University, China*
- C1L-K.4 An Ultra-Low-Power Monitoring System for Inductively Coupled Biomedical Implants.....2283**  
Kamyar Keikhosravy, Pouya Kamalinejad, Shahriar Mirabbasi, Kenichi Takahata, Victor Leung  
*University of British Columbia, Canada*
- C1L-K.5 A Low-Power Wireless Multi-Channel Surface EMG Sensor with Simplified ADPCM Data Compression .....2287**  
Alireza Yousefian, Sébastien Roy, Benoit Gosselin  
*Laval University, Canada*

**C1L-L: SPECIAL SESSION: Advances in Complex Networks - Theories & Applications**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Room 307B

Chairs: Jinhua Lu, *Chinese Academy of Sciences*  
Guanrong Chen, *University of Hong Kong*  
Ljiljana Trajkovic, *Simon Fraser University*

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**C1L-L.1 Theory and Applications of Complex Networks: Advances and Challenges .....2291**

Jinhua Lü<sup>1</sup>, Guanrong Chen<sup>2</sup>, Maciej J. Ogorzalek<sup>3</sup>, Ljiljana Trajkovic<sup>4</sup>  
<sup>1</sup>*Chinese Academy of Sciences, China*; <sup>2</sup>*City University of Hong Kong, China*;  
<sup>3</sup>*Jagiellonian University, Poland*; <sup>4</sup>*Simon Fraser University, Canada*

**C1L-L.2 An Adaptive Routing Algorithm for Load Balancing in Communication Networks....2295**

Jiajing Wu, Chi Kong Michael Tse, Francis C. M. Lau, Ivan W. H. Ho  
*Hong Kong Polytechnic University, Hong Kong*

**C1L-L.3 On the Clustering Coefficients of Temporal Networks and Epidemic Dynamics.....2299**

Jing Cui, Yi-Qing Zhang, Xiang Li  
*Fudan University, China*

**C1L-L.4 Social Learning with Bounded Confidence and Probabilistic Neighbors.....2303**

Qipeng Liu, Xiaofan Wang  
*Shanghai Jiao Tong University, China*

**C1L-L.5 New Spectral Graph Theoretic Conditions for Synchronization in Directed Complex Networks .....2307**

Hui Liu<sup>2</sup>, Ming Cao<sup>2</sup>, Chai Wah Wu<sup>1</sup>  
<sup>1</sup>*IBM T. J. Watson Research Center, United States*; <sup>2</sup>*University of Groningen, Netherlands*

**C2L-A: Theoretical Advances in Neural Networks and Systems II**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 301A

Chair: Jinhua Lu, *Chinese Academy of Sciences*

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- C2L-A.1 Towards Reliable Hybrid Bio-Silicon Integration Using Novel Adaptive Control System.....2311**  
Jun Wen Luo<sup>2</sup>, Patrick Degenaar<sup>2</sup>, Graeme Coopes<sup>2</sup>, Alex Yakovlev<sup>2</sup>, Terrence Mak<sup>1</sup>, Peter Andras<sup>2</sup>  
<sup>1</sup>*Chinese University of Hong Kong, China;* <sup>2</sup>*Newcastle University, United Kingdom*
- C2L-A.2 Image Processing by Three-Layer Cellular Neural Networks with a New Layer Arrangement.....2315**  
Muhammad Izzat Bin Mohd Idrus, Yoshihiro Kato, Yoko Uwate, Yoshifumi Nishio  
*Tokushima University, Japan*
- C2L-A.3 Bifurcation Analysis of Delayed Bidirectional Associative Memory Neural Networks .....2319**  
Min Xiao<sup>1</sup>, Wei Xing Zheng<sup>2</sup>  
<sup>1</sup>*Nanjing Xiaozhuang University, China;* <sup>2</sup>*University of Western Sydney, Australia*
- C2L-A.4 A Model Based Comparison of BiFeO3 Device Applicability in Neuromorphic Hardware .....2323**  
Love Cederström<sup>3</sup>, Paul Stärke<sup>2</sup>, Christian Mayr<sup>2</sup>, Yao Shuai<sup>1</sup>, Heidemarie Schmidt<sup>1</sup>, Rene Schüffny<sup>2</sup>  
<sup>1</sup>*Helmholtz-Zentrum Dresden-Rossendorf, Germany;* <sup>2</sup>*Technische Universität Dresden, Germany;* <sup>3</sup>*ZMD AG, Germany*
- C2L-A.5 Voting Base Online Sequential Extreme Learning Machine for Multi-Class Classification .....2327**  
Jiuwen Cao, Zhiping Lin, Guang-Bin Huang  
*Nanyang Technological University, Singapore*



**C2L-B: FinFet Memory, RF MEMS and Nanosensor**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 301B

Chair: Tuo-Hung Hou, *National Chiao Tung University*

---

- C2L-B.1 Low-Leakage Hybrid FinFET SRAM Cell with Asymmetrical Gate Overlap / Underlap Bitline Access Transistors for Enhanced Read Data Stability .....2331**  
Shairfe Salahuddin, Hailong Jiao, Volkan Kursun  
*Hong Kong University of Science and Technology, Hong Kong*
- C2L-B.2 Design of Nanosensing Platform Based on Zinc Oxide Nanowire Arrays.....2335**  
Anurag Gupta<sup>2</sup>, Mitchell Spryn<sup>2</sup>, Bruce Kim<sup>2</sup>, Eugene Edwards<sup>1</sup>, Christina Brantley<sup>1</sup>, Paul Ruffin<sup>1</sup>  
<sup>1</sup>*U.S. Army, RDECOM/AMRDEC, United States;* <sup>2</sup>*University of Alabama, United States*
- C2L-B.3 SRAM Device and Cell Co-Design Considerations in a 14nm SOI FinFET Technology .....2339**  
Binjie Cheng<sup>3</sup>, Xingsheng Wang<sup>3</sup>, Andrew R. Brown<sup>1</sup>, Jente B. Kuang<sup>2</sup>, David Reid<sup>1</sup>, Campbell Millar<sup>1</sup>, Sani Nassif<sup>2</sup>, Asen Asenov<sup>3</sup>  
<sup>1</sup>*Gold Standard Simulations Ltd, United Kingdom;* <sup>2</sup>*IBM, United States;* <sup>3</sup>*University of Glasgow, United Kingdom*
- C2L-B.4 Statistical Electromigration Analysis of a Chip with the Consideration of a Within-Die Temperature Map.....2343**  
Ted Sun, Ayhan Mutlu, Mahmudur Rahman  
*Santa Clara University, United States*

**C2L-C: Visual Analysis Techniques for Security, Surveillance and Beyond**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 302A

Chairs: Min-Jen Tsai, *National Chiao Tung University, Taiwan*  
Gwo Giun Lee, *National Cheng Kung University*

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- C2L-C.1 Digital Forensics for Printed Source Identification.....2347**  
Min-Jen Tsai, Jung Liu  
*National Chiao Tung University, Taiwan*
- C2L-C.2 Region Incrementing Visual Secret Sharing Scheme Based on Random Grids .....2351**  
Guan-Shi Zhong, Jian-Jun Wang  
*Fudan University, China*
- C2L-C.3 Optimized Learning Rate for Energy Waste Minimization in a Background  
Subtraction Based Surveillance System.....2355**  
Muhammad Umar Karim Khan<sup>1</sup>, Chong Min Kyung<sup>1</sup>, Khawaja Muhammad  
Yahya<sup>2</sup>  
<sup>1</sup>*Korea Advanced Institute of Science and Technology, Korea, South;* <sup>2</sup>*University of  
Engineering and Technology, Peshawar, Pakistan*
- C2L-C.4 Depth Map Enhancement Based on Z-Displacement of Objects .....2361**  
Gwo Giun Lee<sup>2</sup>, Ciao-Siang Siao<sup>2</sup>, Chunhui Cui<sup>1</sup>, Chun-Fu Chen<sup>2</sup>, Yan Huo<sup>1</sup>,  
Huan-Hsiang Lin<sup>2</sup>  
<sup>1</sup>*Hong Kong Applied Science and Technology Research Institute, Hong Kong;*  
<sup>2</sup>*National Cheng Kung University, Taiwan*
- C2L-C.5 Self-Adaptive Scale Transform for IQA Metric .....2365**  
Ke Gu, Guangtao Zhai, Xiaokang Yang, Wenjun Zhang  
*Shanghai Jiao Tong University, China*

**C2L-D: UWB Systems**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 302B

Chair: Franklin Bien, *Ulsan National Institute of Science & Technology*

---

- C2L-D.1 A 0.4V Ultra Low-Power UWB CMOS LNA Employing Noise Cancellation.....2369**  
Mahdi Parvizi<sup>1</sup>, Karim Allidina<sup>1</sup>, Frederic Nabki<sup>2</sup>, Mourad El-Gamal<sup>1</sup>  
*<sup>1</sup>McGill University, Canada; <sup>2</sup>Université du Québec à Montréal, Canada*
- C2L-D.2 An Ultra-Wideband Receiving Antenna Array .....2373**  
Malihe Zarre Dooghabadi, Håkon Andre Hjortland, Tor Sverre Lande  
*Universitetet i Oslo, Norway*
- C2L-D.3 A High Gain Ultra-Wideband Low Noise Amplifier with 802.11a Interference  
Rejection .....2377**  
Ro-Min Weng, Yi-Han Wu, Huo-Ying Chang  
*National Dong Hwa University, Taiwan*
- C2L-D.4 A 3-5 GHz IR-UWB Receiver Front-End for Wireless Sensor Networks .....2380**  
Tuan Anh Vu, Håkon Andre Hjortland, Øivind Næss, Tor Sverre Lande  
*Universitetet i Oslo, Norway*

**C2L-E:**        **Object Detection and Tracking**  
Time:        Wednesday, May 22, 2013, 11:30 - 13:00  
Room:        Room 303A  
Chair:        Tokunbo Ogunfunmi, *Santa Clara University*

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- C2L-E.1**        **Video Object Detection by Model-Based Tracking.....2384**  
De-Kai Huang, Kwang-Yu Chen, Shyi-Chyi Cheng  
*National Taiwan Ocean University, Taiwan*
- C2L-E.2**        **Ground Penetrating Radar Image Enhancement Using Singular Value  
Decomposition .....2388**  
Muhammad Mohsin Riaz, Abdul Ghafoor  
*National University of Sciences and Technology, Pakistan*
- C2L-E.3**        **A Multiple-Candidate-Regeneration-Based Object Tracking System with  
Enhanced Learning Capability by Nearest Neighbor Classifier.....2392**  
Pushe Zhao, Hongbo Zhu, Tadashi Shibata  
*University of Tokyo, Japan*
- C2L-E.4**        **Vehicle Tracking Iterative by Kalman-Based Constrained Multiple-Kernel and 3-D  
Model-Based Localization .....2396**  
Kuan-Hui Lee<sup>2</sup>, Jenq-Neng Hwang<sup>2</sup>, Jen-Yu Yu<sup>1</sup>, Kual-Zheng Lee<sup>1</sup>  
<sup>1</sup>*Information & Communication Research Lab, ITRI, Taiwan;* <sup>2</sup>*University of  
Washington, United States*
- C2L-E.5**        **Multiple Fish Tracking via Viterbi Data Association for Low-Frame-Rate  
Underwater Camera Systems.....2400**  
Meng-Che Chuang<sup>2</sup>, Jenq-Neng Hwang<sup>2</sup>, Kresimir Williams<sup>1</sup>, Richard Towler<sup>1</sup>  
<sup>1</sup>*National Oceanic and Atmospheric Association, United States;* <sup>2</sup>*University of  
Washington, United States*

**C2L-F: Image and Vision Sensors**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 303B

Chairs: Shoushen Chen, *Nanyang Technological University*  
Teresa Serrano-Gotarredona, *Instituto Microelectronica Sevilla*

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- C2L-F.1 Flame Monitoring with an AER Color Vision Sensor .....2404**  
Juan Antonio Leñero-Bardallo, Dag H. Bryn, Philipp Häfliger  
*Universitetet i Oslo, Norway*
- C2L-F.2 2D Motion Sensor with Programmable Feature Extraction .....2408**  
Phillip Sandborn, Pamela Abshire  
*University of Maryland, College Park, United States*
- C2L-F.3 A 120 $\mu$ W 240 $\times$ 110@25fps Vision Chip with ROI Detection SIMD Processing Unit .....2412**  
Arnaud Verdant<sup>1</sup>, Antoine Dupret<sup>1</sup>, Patrick Villard<sup>1</sup>, Laurent Alacoque<sup>1</sup>, Herve Mathias<sup>2</sup>, Flavien Delgehier<sup>2</sup>  
<sup>1</sup>CEA LETI, France; <sup>2</sup>Université Paris-Sud 11, France
- C2L-F.4 A Low Power Multi-Mode CMOS Image Sensor with Integrated on-Chip Motion Detection .....2416**  
Xilin Liu, Milin Zhang, Jan Van der Spiegel  
*University of Pennsylvania, United States*
- C2L-F.5 Improved Contrast Sensitivity DVS and its Application to Event-Driven Stereo Vision .....2420**  
Teresa Serrano-Gotarredona<sup>1</sup>, Jongkil Park<sup>4</sup>, Alejandro Linares-Barranco<sup>2</sup>, A. Jiménez<sup>2</sup>, Ryad Benosman<sup>3</sup>, Bernabe Linares-Barranco<sup>1</sup>  
<sup>1</sup>CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain; <sup>2</sup>Universidad de Sevilla, Spain; <sup>3</sup>Université Pierre-et-Marie-Curie, France; <sup>4</sup>University of California, San Diego, United States

**C2L-G: Programmable & Reconfigurable Architectures I**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 305

Chairs: Pramod Kumar Meher, *Institute for Infocomm Research*  
Chip Hong Chang, *Nanyang Technological University*

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- C2L-G.1 Preprocessing Technique for Accelerating Reconfiguration of Degradable VLSI Arrays .....2424**  
Yuanbo Zhu<sup>2</sup>, Jigang Wu<sup>2</sup>, Seiw Kei Lam<sup>1</sup>, Thambipillai Srikanthan<sup>1</sup>  
<sup>1</sup>*Nanyang Technological University, Singapore*; <sup>2</sup>*Tianjin Polytechnic University, China*
- C2L-G.2 FPGA Based Single Cycle, Reconfigurable Router for NoC Applications .....2428**  
Priyank Gupta<sup>1</sup>, Ali Akoglu<sup>2</sup>, Kathleen Melde<sup>2</sup>, Janet Roveda<sup>2</sup>  
<sup>1</sup>*Cirrus Logic, Inc, United States*; <sup>2</sup>*University of Arizona, United States*
- C2L-G.3 A High Resolution FPGA-Based Merged Delay Line TDC with Nonlinearity Calibration .....2432**  
Yuan-Ho Chen  
*Chung Yuan Christian University, Taiwan*
- C2L-G.4 An FPGA-Based Point Target Detection System Using Morphological Clutter Elimination .....2436**  
Chun-Hsian Huang  
*National Taitung University, Taiwan*
- C2L-G.5 A Hybrid CBRAM/CMOS Look-Up-Table Structure for Improving Performance Efficiency of Field-Programmable-Gate-Array .....2440**  
Santhosh Onkaraiah<sup>1</sup>, Ogun Turkyilmaz<sup>1</sup>, Marina Reyboz<sup>1</sup>, Fabien Clermidy<sup>1</sup>, Elisa Vianello<sup>1</sup>, Jean-Michel Portal<sup>2</sup>, Christophe Muller<sup>2</sup>  
<sup>1</sup>*CEA LETI, France*; <sup>2</sup>*IM2NP / Aix-Marseille Université Marseille, France*

**C2L-H: Calibration Techniques for Data Converters**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 306A

Chairs: João Goes, *Universidade Nova de Lisboa*  
Viktor Gruev, *Washington University St. Louis*

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- C2L-H.1 A Digitally-Calibrated 10GS/s Reconfigurable Flash ADC in 65-nm CMOS .....2444**  
Ramy Yousry, Henry Park, E-Hung Chen, Chih-Kong Ken Yang  
*University of California, Los Angeles, United States*
- C2L-H.2 A 14-bit Pipelined ADC with Digital Background Nonlinearity Calibration.....2448**  
Weitao Li, Cao Sun, Fule Li, Zhihua Wang  
*Tsinghua University, China*
- C2L-H.3 A Self-Calibrated 10-bit 1 MSps SAR ADC with Reduced-Voltage Charge-Sharing DAC.....2452**  
Taimur Rabuske<sup>1</sup>, Jorge Fernandes<sup>1</sup>, Fabio Rabuske<sup>3</sup>, Cesar Rodrigues<sup>3</sup>,  
Marcelino Dos Santos<sup>2</sup>  
<sup>1</sup>*INESC-ID - Universidade Técnica de Lisboa, Portugal*; <sup>2</sup>*INESC-ID - Universidade  
Técnica de Lisboa / SiliconGate Ltda., Portugal*; <sup>3</sup>*Universidade Federal de Santa  
Maria / GMicro, Brazil*
- C2L-H.4 Background Calibration of Time-Interleaved ADC Using Direct Derivative Information.....2456**  
Benwei Xu, Yun Chiu  
*University of Texas at Dallas, United States*
- C2L-H.5 A Time-Interleaved ADC Architecture Exploiting Correlations Between Samples .....2460**  
Yue Xu, Ayman Shabra  
*Masdar Institute of Science and Technology, U.A.E.*

**C2L-J: PLLs and DLLs**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 306B

Chair: Peter Kennedy, *University College Cork*

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- C2L-J.1 A Novel Frequency Search Algorithm to Achieve Fast Locking Without Phase Tracking in ADPLL .....2464**  
Bohan Wu, Weixin Gai, Te Han  
*Peking University, China*
- C2L-J.2 Analytical and Experimental Study of Tuning Range Limitation in mm-Wave CMOS LC-VCOs .....2468**  
Qiyang Wu, Salma Elabd, Jamin McCue, Waleed Khalil  
*Ohio State University, United States*
- C2L-J.3 Clock and Data Recovery Module in 90nm for 10Gbps Serial Link with -18dB Channel Attenuation .....2472**  
Harijot Singh Bindra<sup>1</sup>, Shouri Chatterjee<sup>2</sup>, Kaushik Saha<sup>3</sup>, Taranjit Kukal<sup>1</sup>  
<sup>1</sup>*Cadence Design Systems, India*; <sup>2</sup>*Indian Institute of Technology Delhi, India*; <sup>3</sup>*ST Microelectronics, India*
- C2L-J.4 Phase-Locked Loop Architecture for Enhanced Voltage-Controlled Oscillator Phase-Noise Suppression .....2476**  
Glenn Cowan, Christopher Williams  
*Concordia University, Canada*
- C2L-J.5 A Quadrature UWB Frequency Synthesizer with Dynamic Settling-Time Calibration .....2480**  
Amin Ojani, Behzad Mesgarzadeh, Atila Alvandpour  
*Linköping University, Sweden*



**C2L-K: Biomedical Systems and Algorithms**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 307A

Chairs: Gianluca Setti, *Universita' di Bologna*  
Herming Chiueh, *National Chiao Tung University*

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- C2L-K.1 Artificial Immune System Based Methods for Spam Filtering .....2484**  
Ying Tan, Guyue Mi, Yuanchun Zhu, Chao Deng  
*Peking University, China*
- C2L-K.2 An Analogue Implementation of the Beta Cell Insulin Release Model .....2489**  
Ilias Pagkalos, Pau Herrero, Pantelis Georgiou  
*Imperial College London, United Kingdom*
- C2L-K.3 Parameter Estimation of Hodgkin-Huxley Neuronal Model Using Dual Extended Kalman Filter.....2493**  
Milad Lankarany, Wei-Ping Zhu, M. N. S. Swamy  
*Concordia University, Canada*
- C2L-K.4 Face Gender Recognition with Halftoning-Based Adaboost Classifiers .....2497**  
Jing-Ming Guo, Chen-Chi Lin, Che-Hao Chang, Yun-Fu Liu  
*National Taiwan University of Science and Technology, Taiwan*
- C2L-K.5 Design Optimisation of Front-End Neural Interfaces for Spike Sorting Systems .....2501**  
Deren Barsakcioglu, Amir Eftekhar, Timothy Constandinou  
*Imperial College London, United Kingdom*

**C2L-L: SPECIAL SESSION: Bridging Nonlinear Time Series & Complex Networks**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Room 307B

Chairs: Xiang Li, *Fudan Univeristy*  
Chi K. Tse, *Hong Kong Polytechnic University*

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**C2L-L.1 Recent Advances in Bridging Time Series and Complex Networks.....2505**

Xiang Li<sup>1</sup>, Xin Liu<sup>1</sup>, Chi K. Tse<sup>2</sup>

<sup>1</sup>*Fudan University, China;* <sup>2</sup>*Hong Kong Polytechnic University, Hong Kong*

**C2L-L.2 Complex Networks from Time Series: Capturing Dynamics.....2509**

Michael Small

*University of Western Australia, Australia*

**C3L-A: Complex Networks, Nonlinear Dynamics & Graph Theory**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 301A

Chair: Chai Wah Wu, *IBM T. J. Watson Research Center*

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- C3L-A.1 Consensus in Networked Multi-Agent Systems via Model Predictive Control with Horizon One .....2517**  
Jingyuan Zhan, Xiang Li  
*Fudan University, China*
- C3L-A.2 A Maximum Likelihood Approach to State Estimation of Complex Dynamical Networks with Unknown Noisy Transmission Channel.....2521**  
Hao Zhu<sup>1</sup>, Henry Leung<sup>2</sup>  
<sup>1</sup>*Chongqing University of Posts and Telecommunications, China;* <sup>2</sup>*University of Calgary, Canada*
- C3L-A.3 A Node-Weight Equalization Problem with Circuit-Based Computations .....2525**  
Yoichi Sakai<sup>1</sup>, Kiyoshi Nakayama<sup>2</sup>, Norihiko Shinomiya<sup>1</sup>  
<sup>1</sup>*Soka University, Japan;* <sup>2</sup>*University of California, Irvine, United States*
- C3L-A.4 A 1-bit Physically Unclonable Function Based on a Two-Neurons CNN .....2529**  
Tommaso Addabbo, Ada Fort, Mauro Di Marco, Luca Pancioni, Valerio Vignoli  
*Università degli Studi di Siena, Italy*
- C3L-A.5 Detecting Community Structure of Networks Using Evolutionary Coordination Games .....2533**  
Lang Cao<sup>1</sup>, Xiang Li<sup>1</sup>, Lin Han<sup>2</sup>  
<sup>1</sup>*Fudan University, China;* <sup>2</sup>*Shanghai Mechanical & Electrical Engineering Institute, China*

**C3L-B: Computer-Aided Design**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 301B

Chair: Yu Wang, *Tsinghua University*

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- C3L-B.1 Overclocking Datapath for Latency-Error Tradeoff .....2537**  
Kan Shi, David Boland, George Constantinides  
*Imperial College London, United Kingdom*
- C3L-B.2 Affine Transformations for Communication and Reconfiguration Optimization of Loops on CGRAs.....2541**  
Dajiang Liu, Shouyi Yin, Leibo Liu, Shaojun Wei  
*Tsinghua University, China*
- C3L-B.3 Pattern Generation for Mutation Analysis Using Genetic Algorithms .....2545**  
Yen-Chi Yang<sup>1</sup>, Chun-Yao Wang<sup>1</sup>, Ching-Yi Huang<sup>1</sup>, Yung-Chih Chen<sup>2</sup>  
<sup>1</sup>*National Tsing Hua University, Taiwan;* <sup>2</sup>*Yuan Ze University, Taiwan*
- C3L-B.4 Simultaneous Gate Sizing and Vt Assignment Using Fanin/Fanout Ratio and Simulated Annealing .....2549**  
Tiago Reimann, Gracieli Posser, Guilherme Flach, Marcelo Johann, Ricardo Reis  
*Universidade Federal do Rio Grande do Sul, Brazil*
- C3L-B.5 Analytic Modeling of Interconnect Capacitance in Submicron and Nanometer Technologies .....2553**  
Gholamreza Shomalnasab, Howard. M. Heys, Lihong Zhang  
*Memorial University of Newfoundland, Canada*

**C3L-C: Circuits and Systems Education**  
Time: Wednesday, May 22, 2013, 14:30 - 16:00  
Room: Room 302A  
Chairs: Tokunbo Ogunfunmi, *Santa Clara University*  
Babak Ayazifar, *University of California, Berkeley*

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- C3L-C.1 Fun Examples for Teaching Linear and Nonlinear Circuits .....2557**  
Hans H. Brunner, Josef A. Nossek  
*Technische Universität München, Germany*
- C3L-C.2 Architecture and Implementation of a Development Board for Low-Power Education .....2561**  
Marco Winzker, Andrea Schwandt, Tobias Krumkamp, Alexander Tieke  
*Bonn-Rhine-Sieg University, Germany*
- C3L-C.3 The Design of an Audio Power Amplifier as a Class Project for Undergraduate Students .....2565**  
Nuno Paulino, Joao Oliveira, Rui Santos-Tavares  
*UNINOVA/CTS - Universidade Nova de Lisboa, Portugal*
- C3L-C.4 Integration of a Wireless Sensor Network Project for Introductory Circuits and Systems Teaching .....2569**  
Chi-Un Lei<sup>1</sup>, Ngai Wong<sup>1</sup>, Ka Lok Man<sup>2</sup>  
<sup>1</sup>*University of Hong Kong, Hong Kong*; <sup>2</sup>*Xi'an Jiaotong-Liverpool University, China*
- C3L-C.5 LSMaker: a Robotic Platform for Engineering Education .....2573**  
Jordi Albo-Canals, David Vernet, Xavi Canaleta, Xavier Vilasís-Cardona  
*La Salle - Ramon Llull University, Spain*

**C3L-D: Cryptography and Security for Communication Systems**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 302B

Chair: Vassilis Paliouras, *University of Patras*

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- C3L-D.1 An Area-Efficient Shuffling Scheme for AES Implementation on FPGA.....2577**  
Yi Wang, Yajun Ha  
*National University of Singapore, Singapore*
- C3L-D.2 DPA Resistance of Charge-Sharing Symmetric Adiabatic Logic .....2581**  
Cancio Monteiro, Yasuhiro Takahashi, Toshikazu Sekine  
*Gifu University, Japan*
- C3L-D.3 High Performance Scalable Elliptic Curve Cryptosystem Processor in GF(2<sup>m</sup>) .....2585**  
Kung Chi Cinnati Loi, Seokbum Ko  
*University of Saskatchewan, Canada*
- C3L-D.4 FPGA Implementation of a Large-Number Multiplier for Fully Homomorphic Encryption.....2589**  
Wei Wang, Xinming Huang  
*Worcester Polytechnic Institute, United States*
- C3L-D.5 A GPU Implementation of the Montgomery Multiplication Algorithm for Elliptic Curve Cryptography.....2593**  
Karl Leboeuf, Roberto Muscedere, Majid Ahmadi  
*University of Windsor, Canada*

**C3L-E: Signal Processing**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 303A

Chairs: Soo-Chang Pei, *National Taiwan University*

Chien-Cheng Tseng, *National Kaohsiung First Univ. of Science & Technology*

---

- C3L-E.1 Closed-Form Eigenvectors of the Discrete Fourier Transform.....2597**  
Wen-Liang Hsue<sup>1</sup>, Soo-Chang Pei<sup>2</sup>  
<sup>1</sup>*Chung Yuan Christian University, Taiwan;* <sup>2</sup>*National Taiwan University, Taiwan*
- C3L-E.2 High-Performance RDFT Design for Applications of Digital Radio Mondiale .....2601**  
Shin-Chi Lai, Wen-Ho Juang, Yueh-Shu Lee, Sheau-Fang Lei  
*National Cheng Kung University, Taiwan*
- C3L-E.3 A New Involutory Parametric Transform and its Application to Image Encryption ....2605**  
Saad Bouguezel<sup>2</sup>, M. Omair Ahmad<sup>1</sup>, M. N. S. Swamy<sup>1</sup>  
<sup>1</sup>*Concordia University, Canada;* <sup>2</sup>*University Setif 1, Algeria*
- C3L-E.4 Closed-Form Design of Fractional Order Differentiator Using Discrete Cosine Transform.....2609**  
Chien-Cheng Tseng<sup>2</sup>, Su-Ling Lee<sup>1</sup>  
<sup>1</sup>*Chang Jung Christian University, Taiwan;* <sup>2</sup>*National Kaohsiung First University of Science and Technology, Taiwan*
- C3L-E.5 A Method for Optimal SINR Under Non-i.i.d. Interferences .....2613**  
Rueywen Liu<sup>3</sup>, Xu Wang<sup>1</sup>, Rendong Ying<sup>2</sup>, Bo Hu<sup>1</sup>  
<sup>1</sup>*Fudan University, China;* <sup>2</sup>*Shanghai Jiao Tong University, China;* <sup>3</sup>*University of Notre Dame, United States*

**C3L-F: Vision and Temperature Sensors**  
Time: Wednesday, May 22, 2013, 14:30 - 16:00  
Room: Room 303B  
Chairs: Walter Daniel Leon-Salas, *Purdue University*  
Timothy Constandinou, *Imperial College London*

---

- C3L-F.1 A Low Power All-Digital Self-Calibrated Temperature Sensor Using 65nm FPGAs ...2617**  
Shuang Xie, Waitung Ng  
*University of Toronto, Canada*
- C3L-F.2 A CMOS on-Chip Temperature Sensor with -0.21 C/ 0.17 C Inaccuracy from -20 C to 100 C .....2621**  
Chen Zhao, Yen-Ting Wang, David Genzer, Degang Chen, Randall Geiger  
*Iowa State University, United States*
- C3L-F.3 A CMOS 8x8 SPAD Array for Time-of-Flight Measurement and Light-Spot Statistics .....2626**  
Ion Vornicu, Ricardo Carmona-Galán, Ángel Rodríguez-Vázquez  
*CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain*
- C3L-F.4 Velocity Saturation Current-Mode CMOS Imaging Sensor.....2630**  
Raphael Njuguna, Viktor Gruev  
*Washington University in St. Louis, United States*
- C3L-F.5 A Hybrid CMOS Imager with Sensing and Energy Harvesting Capabilities .....2634**  
Hsuan-Tsung Wang<sup>2</sup>, Walter Leon-Salas<sup>1</sup>  
<sup>1</sup>*Purdue University, United States*; <sup>2</sup>*University of Missouri-Kansas City, United States*



**C3L-G: Interconnects, Noise Immunity and ESD**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 305

Chairs: Zhiyuan Yan, *Lehigh University*  
Wael Badawy, *IntelliView*

---

- C3L-G.1 Low-Leakage Power-Rail ESD Clamp Circuit with Gated Current Mirror in a 65-nm CMOS Technology .....2638**  
Federico Altolaguirre, Ming-Dou Ker  
*National Chiao Tung University, Taiwan*
- C3L-G.2 TSV Modeling: Non-Uniform Substrate Doping Effect and Coupling Capacitance with Metal Interconnects in 3D-ICs .....B#5**  
Khaled Salah  
*Mentor Graphics Cairo, Egypt*
- C3L-G.3 Modeling and Analysis of Signal Transmission with Through Silicon via (TSV) Noise Coupling .....2646**  
Zhenyang Chen<sup>2</sup>, Qin Wang<sup>2</sup>, Jing Xie<sup>2</sup>, Jin Tian<sup>2</sup>, Jianfei Jiang<sup>2</sup>, Yufei Li<sup>1</sup>, Wen Yin<sup>1</sup>  
<sup>1</sup>*IBM China System Technology Lab, China Design Center, China;* <sup>2</sup>*Shanghai Jiao Tong University, China*
- C3L-G.4 Current Profile of a Microcontroller to Determine Electromagnetic Emissions .....2650**  
Selcuk Köse<sup>3</sup>, Eby Friedman<sup>2</sup>, Radu Secareanu<sup>1</sup>, Olin Hartin<sup>1</sup>  
<sup>1</sup>*Freescale Semiconductor, United States;* <sup>2</sup>*University of Rochester, United States;* <sup>3</sup>*University of South Florida, United States*
- C3L-G.5 Synthesis of 3D Clock Tree with Pre-Bond Testability .....2654**  
Syng-Jyan Wang<sup>1</sup>, Cheng-Hao Lin<sup>1</sup>, Katherine Shu-Min Li<sup>2</sup>  
<sup>1</sup>*National Chung Hsing University, Taiwan;* <sup>2</sup>*National Sun Yat-sen University, Taiwan*

**C3L-H: Testing and Verification**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 306A

Chairs: Degang J Chen, *Iowa State University*  
Viktor Gruev, *Washington University St. Louis*

---

- C3L-H.1 Practical Methods for Verifying Removal of Trojan Stable Operating Points .....2658**  
Yen-Ting Wang, Degang Chen, Randall Geiger  
*Iowa State University, United States*
- C3L-H.2 A Structured DC Analysis Methodology for Accurate Verification of Analog Circuits .....2662**  
Farakh Javid<sup>2</sup>, Ramy Iskander<sup>2</sup>, Marie-Minerve Louërat<sup>2</sup>, François Durbin<sup>1</sup>  
<sup>1</sup>*CEA DAM, France*; <sup>2</sup>*Université Pierre et Marie Curie / LIP6, France*
- C3L-H.3 Channel Characterization Using Jitter Measurements .....2666**  
Dustin Dunwell<sup>2</sup>, Atul Gupta<sup>1</sup>, Anthony Chan Carusone<sup>2</sup>  
<sup>1</sup>*Mindspeed Technologies Inc., United States*; <sup>2</sup>*University of Toronto, Canada*
- C3L-H.4 Electronically Programmable Test Points for on-Chip Analog/Digital Measurements .....2670**  
Murillo Franco<sup>1</sup>, Jairo Güiza<sup>1</sup>, Erasmo Chiappetta<sup>1</sup>, Sergio Rueda<sup>1</sup>, Hamilton Luis<sup>1</sup>, José Bertuzzo<sup>1</sup>, James Koeppel<sup>2</sup>, Tim Robins<sup>2</sup>, Julian Jenkins<sup>2</sup>, Tara Hamilton<sup>3</sup>  
<sup>1</sup>*Instituto de Pesquisas Eldorado, Brazil*; <sup>2</sup>*Perceptia Devices Inc., Australia*; <sup>3</sup>*University of New South Wales, Australia*
- C3L-H.5 High Resolution ADC Spectral Test with Known Impure Source and Non-Coherent Sampling .....2674**  
Siva Sudani, Degang Chen, Randall Geiger  
*Iowa State University, United States*

**C3L-J: Design, Modeling & Simulation of Oscillators**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 306B

Chair: Giancarlo Storti Gajani, *Politecnico di Milano*

---

- C3L-J.1 A Linearized Voltage-Controlled Oscillator for Dual-Path Phase-Locked Loops.....2678**  
Glenn Cowan<sup>1</sup>, Mounir Meghelli<sup>2</sup>, Daniel Friedman<sup>2</sup>  
<sup>1</sup>Concordia University, Canada; <sup>2</sup>IBM T. J. Watson, United States
- C3L-J.2 An All-Digital on-Chip Silicon Oscillator with Automatic VT Range Selection  
Relative Modeling .....2682**  
Ching-Che Chung, Jhih-Wei Li  
*National Chung Cheng University, Taiwan*
- C3L-J.3 Simulating Phase Noise Induced from Cyclostationary Noise Sources .....2686**  
Federico Pepe, Andrea Bonfanti, Salvatore Levantino, Paolo Maffezzoni, Carlo Samori, Andrea Lacaita  
*Politecnico di Milano, Italy*
- C3L-J.4 A 2.7-GHz Digitally-Controlled Ring Oscillator with Supply Sensitivity of  
0.0014%-fDCO/1%-VDD Using Digital Current-Regulated Tuning .....2690**  
Te Han, Weixin Gai  
*Peking University, China*
- C3L-J.5 Effects of Numerical Noise Floor on the Accuracy of Time Domain Noise  
Analysis in Circuit Simulators .....2694**  
Matteo Biggio<sup>2</sup>, Federico Bizzarri<sup>1</sup>, Angelo Maurizio Brambilla<sup>1</sup>, Marco Storace<sup>2</sup>  
<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>Università degli Studi di Genova, Italy

**C3L-K: Circuit Theory**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 307A

Chairs: Baoyong Chi, *Tsinghua University*  
He Tang, *UESTC*

---

- C3L-K.1 A 0.5V 10GHz 8-Phase LC-VCO Combining Current-Reuse and Back-Gate-Coupling Techniques Consuming 2mW .....2698**  
Md.Tawfiq Amin, Pui-In Mak, Rui-Paulo Martins  
*Universidade de Macau, China*
- C3L-K.2 On Loop Gain in Linear Networks .....2702**  
Igor Filanovsky<sup>2</sup>, Agustin Ochoa<sup>1</sup>  
<sup>1</sup>*Rockwell Se. Systems, United States*; <sup>2</sup>*University of Alberta, Canada*
- C3L-K.3 Improving the Power Efficiency of 60 GHz Phase Arrays by Eliminating the Array-Induced Inter-Symbol Interference .....B#5**  
Sam Gharavi, Frank Chang, Babak Daneshrad  
*University of California, Los Angeles, United States*
- C3L-K.4 Modeling and Fabrication of an RF MEMS Variable Capacitor with a Fractal Geometry .....2711**  
Amro Elshurafa<sup>2</sup>, Khaled Nabil Salama<sup>2</sup>, Pakhung Ho<sup>1</sup>  
<sup>1</sup>*ASM Pacific Technology Hong Kong Limited, Hong Kong*; <sup>2</sup>*King Abdullah University of Science and Technology, Saudi Arabia*
- C3L-K.5 A High Dynamic Range Programmable Gain Amplifier for HomePlug AV Powerline Communication System .....2715**  
Szu-Yao Hung, Kai-Hsiang Chan, Charlie Chung-Ping Chen  
*National Taiwan University, Taiwan*

**C3L-L: SPECIAL SESSION: Nonlinearity in Energy Harvesters - Analysis & Applications**

Time: Wednesday, May 22, 2013, 14:30 - 16:00

Room: Room 307B

Chairs: Elena Blokhina, *University College Dublin*  
Abdelali El Aroudi, *University Rovira I Virgili*  
Dimitri Galayko, *UPMC*

---

- C3L-L.1 Nonlinear Effects in Electrostatic Vibration Energy Harvesters: Current Progress and Perspectives .....2719**  
Dimitri Galayko<sup>1</sup>, Elena Blokhina<sup>2</sup>  
*<sup>1</sup>Université Pierre et Marie Curie / LIP6, France; <sup>2</sup>University College Dublin, Ireland*
- C3L-L.2 On-Chip Starter Circuit for Switched-Inductor DC-DC Harvester Systems .....2723**  
Andres Blanco, Gabriel Rincón-Mora  
*Georgia Institute of Technology, United States*
- C3L-L.3 Nonlinear Dynamics in a Graphene Nanostructured Device for Energy Harvesting .....2727**  
Abdelali El Aroudi<sup>2</sup>, Miquel López-Suárez<sup>3</sup>, Eduard Alarcón<sup>4</sup>, Riccardo Rurali<sup>1</sup>, Gabriel Abadal<sup>3</sup>  
*<sup>1</sup>Institut de Ciència de Materials de Barcelona, Spain; <sup>2</sup>Univeristat Rovira i Virgili, Spain; <sup>3</sup>Universitat Autònoma de Barcelona, Spain; <sup>4</sup>Universitat Politècnica de Catalunya, Spain*
- C3L-L.4 Impact-Based Electrostatic Harvesters Considered as a Multi-Source Problem .....2731**  
Cuong Le, Einar Halvorsen  
*Vestfold University College, Norway*
- C3L-L.5 Nonlinear Vibration Energy Harvesting at Work: an Application for the Automotive Sector .....2735**  
Francesco Orfei, Igor Neri, Helios Vocca, Luca Gammaitoni  
*Università degli Studi di Perugia, Italy*

**C4L-A: Chaos, Bifurcation, Nonlinear Phenomena**

Time: Wednesday, May 22, 2013, 16:20 - 17:50

Room: Room 301A

Chairs: Zbigniew Galias, *AGH-University of Science and Technology*  
Sergio Callegari, *Università di Bologna*

---

- C4L-A.1 Combined Mechanical and Circuit Nonlinearities in Electrostatic Vibration Energy Harvesters.....2739**  
Elena Blokhina<sup>3</sup>, Daniele Fournier-Prunaret<sup>1</sup>, Peter Harte<sup>3</sup>, Dimitri Galayko<sup>2</sup>, Orla Feely<sup>3</sup>  
<sup>1</sup>LAAS-CNRS, INSA, Toulouse, France; <sup>2</sup>Université Pierre et Marie Curie / LIP6, France; <sup>3</sup>University College Dublin, Ireland
- C4L-A.2 Chaotic Behaviour in a Three Element Memristor Based Circuit Using Fourth Order Polynomial and PWL Nonlinearity .....2743**  
Michael McCullough<sup>2</sup>, Herbert Ho-Ching lu<sup>2</sup>, Bharathwaj Muthuswamy<sup>1</sup>  
<sup>1</sup>Milwaukee School of Engineering, United States; <sup>2</sup>University of Western Australia, Australia
- C4L-A.3 Spurious Tones in Digital Delta Sigma Modulators with Pseudorandom Dither .....2747**  
Michael Peter Kennedy<sup>2</sup>, Brian Fitzgibbon<sup>1</sup>, Kerry Dobmeier<sup>3</sup>  
<sup>1</sup>Susquehanna International Group, Ireland; <sup>2</sup>University College Cork, Ireland; <sup>3</sup>University of Notre Dame, United States
- C4L-A.4 Combination of Exhaustive Search and Continuation Method for the Study of Sinks in the Hénon Map .....2751**  
Zbigniew Galias<sup>1</sup>, Warwick Tucker<sup>2</sup>  
<sup>1</sup>AGH University of Science and Technology, Poland; <sup>2</sup>Uppsala University, Sweden
- C4L-A.5 Dynamical Analysis of Single-Inductor Dual-Output DC-DC Converters.....2755**  
Kuntal Mandal<sup>3</sup>, Abdullah Abusorrah<sup>4</sup>, Mohammed M. Al- Hindawi<sup>4</sup>, Yusuf Al-Turki<sup>4</sup>, Damian Giaouris<sup>1</sup>, Soumitro Banerjee<sup>2</sup>  
<sup>1</sup>Centre for Research and Technology Hellas, Greece; <sup>2</sup>Indian Institute of Science Education & Research -Kolkata, India; <sup>3</sup>Indian Institute of Technology Kharagpur, India; <sup>4</sup>King Abdulaziz University, Saudi Arabia

**C4L-C: DSP and Circuit Education**

Time: Wednesday, May 22, 2013, 16:20 - 17:50

Room: Room 302A

Chairs: Ravi Ramachandran, *Rowan University*  
Tokunbo Ogunfunmi, *Santa Clara University*

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- C4L-C.1 A Spiral Learning Approach to Hardware Description Languages .....2759**  
Srinivasa Vemuru, Sami Khorbotly, Firas Hassan  
*Ohio Northern University, United States*
- C4L-C.2 Teaching Electronic Circuits Online: Lessons from MITx's 6.002x on edX.....2763**  
Piotr Mitros<sup>1</sup>, Khurram Afridi<sup>2</sup>, Gerald Sussman<sup>2</sup>, Chris Terman<sup>2</sup>, Jacob White<sup>2</sup>,  
Lyla Fischer<sup>1</sup>, Anant Agarwal<sup>1</sup>  
<sup>1</sup>*edX, United States;* <sup>2</sup>*Massachusetts Institute of Technology, United States*
- C4L-C.3 A Freshman Level Module in Biometric Systems .....2767**  
Sara Davis, Megan N. Frankle, Ravi Ramachandran, Kevin D. Dahm, Robi  
Polikar  
*Rowan University, United States*
- C4L-C.4 Efficient Decision Feedforward Equalizer with Parallelizable Architecture.....2771**  
Ariel Luis Pola<sup>2</sup>, Juan Edmundo Cousseau<sup>3</sup>, Oscar Ernesto Agazzi<sup>1</sup>, Mario Rafael  
Hueda<sup>2</sup>  
<sup>1</sup>*ClariPhy Communications, Inc, United States;* <sup>2</sup>*Laboratorio de Comunicaciones  
Digitales - Universidad Nacional de Córdoba, Argentina;* <sup>3</sup>*Universidad Nacional del  
Sur - Bahía Blanca, Argentina*
- C4L-C.5 Delay Element Concept for Continuous Time Digital Signal Processing .....2775**  
Karsten Konrad<sup>2</sup>, Dieter Brückmann<sup>2</sup>, Nima Tavangaran<sup>2</sup>, Jidan Al-Eryani<sup>1</sup>,  
Rainer Kokozinski<sup>1</sup>, Thomas Werthwein<sup>2</sup>  
<sup>1</sup>*Universität Duisburg-Essen, Germany;* <sup>2</sup>*Universität Wuppertal, Germany*

**C4L-L: SPECIAL SESSION: Circuit Aspects of Non-radiative Wireless Power Transfer**

Time: Wednesday, May 22, 2013, 16:20 - 17:50

Room: Room 307B

Chairs: Ki Young Kim, *Samsung Advanced Institute of Technology*  
Elisenda Bou, *Technical University of Catalunya*

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- C4L-L.1 On the Efficient Wireless Power Transfer in Resonant Multi-Receiver Systems .....2779**  
David Ricketts<sup>2</sup>, Matthew Chabalko<sup>1</sup>  
<sup>1</sup>Central Michigan University, United States; <sup>2</sup>North Carolina State University, United States
- C4L-L.2 Interference Analysis on Resonant Inductive Coupled Wireless Power Transfer Links .....2783**  
Elisenda Bou<sup>2</sup>, Eduard Alarcon<sup>2</sup>, Raymond Sedwick<sup>3</sup>, Peter Fisher<sup>1</sup>  
<sup>1</sup>Massachusetts Institute of Technology, United States; <sup>2</sup>Universitat Politècnica de Catalunya, Spain; <sup>3</sup>University of Maryland, College Park, United States
- C4L-L.3 Design Methodology for Inductive Power Transfer Systems Targeting High Power Implantable Devices .....2787**  
Ho Yan Leung, Daniel McCormick, David Budgett, Aiguo Patrick Hu  
*University of Auckland, New Zealand*
- C4L-L.4 Constant Current Charging in Series-Series Compensated Non-Radiative Wireless Power Link .....2792**  
Shin-Young Cho<sup>1</sup>, Il-Oun Lee<sup>1</sup>, Sangcheol Moon<sup>1</sup>, Gun-Woo Moon<sup>1</sup>, Bong-Chul Kim<sup>2</sup>, Ki Young Kim<sup>2</sup>  
<sup>1</sup>Korea Advanced Institute of Science and Technology, Korea, South; <sup>2</sup>Samsung Advanced Institute of Technology, Korea, South
- C4L-L.5 A 60-GHz Rectenna for Monolithic Wireless Sensor Tags .....2796**  
Hao Gao, Ulf Johannsen, Marion Matters-Kammerer, Dusan Milosevic, A. Bart Smolders, Arthur van Roermund, Peter Baltus  
*Eindhoven University of Technology, Netherlands*



**C5P-N: Image and Video Processing & Applications**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Poster Area

Chairs: Ioannis Pitas, *Aristotle University of Thessaloniki*  
Moncef Gabbouj, *Tampere University of Technology*

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- C5P-N.1 Demosaicking of Color Filter Array Patterns Using Quaternion Fourier Transform and Low Pass Filter.....2800**  
Soo-Chang Pei, Yue-Zhe Hsiao  
*National Taiwan University, Taiwan*
- C5P-N.2 Algorithm Adaptive Video Deinterlacing Using Self-Validation Framework.....2804**  
Ting-Chun Wang, Yi-Nung Liu, Shao-Yi Chien  
*National Taiwan University, Taiwan*
- C5P-N.3 Color Constancy via Chromaticity Neutralization: from Single to Multiple Illuminants .....2808**  
Feng-Ju Chang<sup>1</sup>, Soo-Chang Pei<sup>2</sup>  
<sup>1</sup>*Academia Sinica, Taiwan*; <sup>2</sup>*National Taiwan University, Taiwan*
- C5P-N.4 Fast and Improved Seam Carving with Strip Partition and Neighboring Probability Constraints .....2812**  
Lifang Wu<sup>1</sup>, Lianchao Cao<sup>1</sup>, Changwen Chen<sup>2</sup>  
<sup>1</sup>*Beijing University of Technology, China*; <sup>2</sup>*State University of New York at Buffalo, United States*
- C5P-N.5 Adaptive Watermarking Technique Based on Human Visual System and Fuzzy Inference System.....2816**  
Muhammad Imran<sup>1</sup>, Abdul Ghafoor<sup>2</sup>, Muhammad Mohsin Riaz<sup>2</sup>  
<sup>1</sup>*Balochistan University of Information Technology, Engineering, Pakistan*; <sup>2</sup>*National University of Sciences and Technology, Pakistan*

**C5P-P: Image Processing**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Poster Area

Chair: Karen Egiazarian, *Tampere University of Technology*

---

- C5P-P.1 Image Denoising via Graph Regularized K-SVD.....2820**  
Yibin Tang<sup>1</sup>, Yuan Shen<sup>1</sup>, Aimin Jiang<sup>2</sup>, Ning Xu<sup>1</sup>, Changping Zhu<sup>2</sup>  
<sup>1</sup>*Changzhou Key Laboratory of Sensor Networks and Environmental Sensing, China;*  
<sup>2</sup>*Hohai University, China*
- C5P-P.2 A Hybrid Image Restoration Algorithm Based on Projections Onto Convex Sets and Harmony Search .....2824**  
Rafael Pires, Luis Pereira, Alex Mansano, Joao Paulo Papa  
*Universidade Estadual Paulista, Brazil*
- C5P-P.3 Computation of Partial Fractional Derivative of Digital Image Using Discrete Cosine Transform.....2828**  
Chien-Cheng Tseng<sup>2</sup>, Su-Ling Lee<sup>1</sup>  
<sup>1</sup>*Chang Jung Christian University, Taiwan;* <sup>2</sup>*National Kaohsiung First University of Science and Technology, Taiwan*
- C5P-P.4 Adaptive Parameter Estimation for Total Variation Image Denoising .....2832**  
Baoxian Wang, Baojun Zhao, Chenwei Deng, Linbo Tang  
*Beijing Institute of Technology, China*
- C5P-P.5 Improved Total Variation Based Image Compressive Sensing Recovery by Nonlocal Regularization .....2836**  
Jian Zhang<sup>1</sup>, Shaohui Liu<sup>1</sup>, Ruiqin Xiong<sup>2</sup>, Siwei Ma<sup>2</sup>, Debin Zhao<sup>1</sup>  
<sup>1</sup>*Harbin Institute of Technology, China;* <sup>2</sup>*Peking University, China*

**C5P-Q: Multimedia 3D**

Time: Wednesday, May 22, 2013, 09:40 - 11:10  
Room: Poster Area  
Chairs: Anthony Vetro, *Mitsubishi Electric Research Labs*  
Lai-Man Po, *City University of Hong Kong*

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- C5P-Q.1 Depth-Aided Exemplar-Based Hole Filling for DIBR View Synthesis.....2840**  
Xuyuan Xu<sup>2</sup>, Lai-Man Po<sup>2</sup>, Chun-Ho Cheung<sup>2</sup>, Litong Feng<sup>2</sup>, Ka-Ho Ng<sup>2</sup>, Kwok-Wai Cheung<sup>1</sup>  
<sup>1</sup>*Chu Hai College of Higher Education, Hong Kong*; <sup>2</sup>*City University of Hong Kong, Hong Kong*
- C5P-Q.2 Cross-Scene Abnormal Event Detection .....2844**  
Tzu-Yi Hung<sup>2</sup>, Jiwen Lu<sup>1</sup>, Yap-Peng Tan<sup>2</sup>  
<sup>1</sup>*Advanced Digital Sciences Center, Illinois at Singapore Pte. Ltd., Singapore*;  
<sup>2</sup>*Nanyang Technological University, Singapore*
- C5P-Q.3 To Exploit Uncertainty Masking for Adaptive Image Rendering.....2848**  
Lu Dong<sup>2</sup>, Weisi Lin<sup>2</sup>, Chenwei Deng<sup>1</sup>, Ce Zhu<sup>2</sup>, Hock Soon Seah<sup>2</sup>  
<sup>1</sup>*Beijing Institute of Technology, China*; <sup>2</sup>*Nanyang Technological University, Singapore*
- C5P-Q.4 A Fast Depth-Map Wedgelet Partitioning Scheme for Intra Prediction in 3D Video Coding .....2852**  
Mengmeng Zhang<sup>3</sup>, Chuan Zhao<sup>3</sup>, Jizheng Xu<sup>2</sup>, Huihui Bai<sup>1</sup>  
<sup>1</sup>*Beijing Jiaotong University, China*; <sup>2</sup>*Microsoft Research Asia, China*; <sup>3</sup>*North China University of Technology, China*
- C5P-Q.5 Error Concealment for 3D Video Transmission .....2856**  
Wen-Nung Lie, Guan-Hua Lin  
*National Chung Cheng University, Taiwan*

**C5P-R: Multimedia Coding and Processing**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Poster Area

Chairs: Homer H. Chen, *National Taiwan University*  
Weiyao Lin, *Shanghai Jiao Tong University*

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- C5P-R.1 Fast Vehicle Detection Based on Feature and Real-Time Prediction.....2860**  
Hanyang Xu<sup>1</sup>, Zeng Zhou<sup>2</sup>, Bin Sheng<sup>1</sup>, Lizhuang Ma<sup>1</sup>  
*<sup>1</sup>Shanghai Jiao Tong University, China; <sup>2</sup>Suntec Software Shanghai Co., LTD, China*
- C5P-R.2 Parallelizing Video Transcoding with Load Balancing on Cloud Computing.....2864**  
Song Lin<sup>2</sup>, Xinfeng Zhang<sup>1</sup>, Qin Yu<sup>2</sup>, Honggang Qi<sup>3</sup>, Siwei Ma<sup>2</sup>  
*<sup>1</sup>Institute of Computing Technology, Chinese Academy of Sciences, China; <sup>2</sup>Peking University, China; <sup>3</sup>University of Chinese Academy of Sciences, China*
- C5P-R.3 Speeding Up the Runtime Performance for Lossless Image Coding on GPUs with CUDA.....2868**  
Lih-Jen Kau, Chih-Shen Chen  
*National Taipei University of Technology, Taiwan*
- C5P-R.4 Optimization of Workload Scheduling for Multimedia Cloud Computing.....2872**  
Xiaoming Nan, Yifeng He, Ling Guan  
*Ryerson University, Canada*
- C5P-R.5 Human Emotion Recognition Using the Adaptive Sub-Layer-Compensation Based Facial Edge Detection .....2876**  
Yi Huang, Yun Tie, Anastasios Venetsanopoulos, Ling Guan  
*Ryerson University, Canada*

**C5P-S: Visual Analysis and Enhancement**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Poster Area

Chairs: Chia-Wen Lin, *National Tsing Hua University*  
Siwei Ma, *Peking University, China*

---

- C5P-S.1 A Spatial Inter-View Auto-Regressive Super-Resolution Scheme for Multi-View Image via Scene Matching Algorithm.....2880**  
Min Gao<sup>1</sup>, Siwei Ma<sup>2</sup>, Debin Zhao<sup>1</sup>, Wen Gao<sup>2</sup>  
<sup>1</sup>Harbin Institute of Technology, China; <sup>2</sup>Peking University, China
- C5P-S.2 Recover Image Details from LDR Photographs.....2884**  
Kui Fan<sup>1</sup>, Honggang Qi<sup>3</sup>, Dawei Du<sup>2</sup>, Changhua Zhang<sup>2</sup>  
<sup>1</sup>Beijing Jiaotong University, China; <sup>2</sup>University of Electronic Science and Technology of China, China; <sup>3</sup>University of the Chinese Academy of Science, China
- C5P-S.3 A Saliency Detection Model Based on Sparse Features and Visual Acuity .....2888**  
Yuming Fang<sup>4</sup>, Weisi Lin<sup>4</sup>, Zhenzhong Chen<sup>3</sup>, Chia-Wen Lin<sup>5</sup>, Zhijun Fang<sup>2</sup>,  
Chenwei Deng<sup>1</sup>  
<sup>1</sup>Beijing Institute of Technology, China; <sup>2</sup>Jiangxi University of Finance and Economics, China; <sup>3</sup>MediaTek USA Inc., United States; <sup>4</sup>Nanyang Technological University, Singapore; <sup>5</sup>National Tsing Hua University, Taiwan
- C5P-S.4 A New Local-Main-Gradient-Orientation HOG and Contour Differences Based Algorithm for Object Classification .....2892**  
Xiaoqiong Su<sup>2</sup>, Weiyao Lin<sup>2</sup>, Xiaozhen Zheng<sup>1</sup>, Xintong Han<sup>2</sup>, Hang Chu<sup>2</sup>,  
Xiaoyun Zhang<sup>2</sup>  
<sup>1</sup>Huawei Technologies, China; <sup>2</sup>Shanghai Jiao Tong University, China
- C5P-S.5 SIFT-Based Image Super-Resolution .....2896**  
Huanjing Yue<sup>3</sup>, Jingyu Yang<sup>3</sup>, Xiaoyan Sun<sup>2</sup>, Feng Wu<sup>1</sup>  
<sup>1</sup>Microsoft Research Aisa, China; <sup>2</sup>Microsoft Research Asia, China; <sup>3</sup>Tianjin University, China

**C5P-T: Multiview and 3D Visual Signal Processing**

Time: Wednesday, May 22, 2013, 09:40 - 11:10

Room: Poster Area

Chairs: Viet Anh Nguyen, *Advanced Digital Sciences Center, Singapore*  
Yap-Peng Tan, *Nanyang Technological University*

---

- C5P-T.1 Efficient View Synthesis Based Error Concealment Method for Multiview Video Plus Depth.....2900**  
Vu Hiep Doan<sup>2</sup>, Viet Anh Nguyen<sup>1</sup>, Minh N. Do<sup>3</sup>  
*<sup>1</sup>Advanced Digital Sciences Center, Illinois at Singapore Pte. Ltd., Singapore; <sup>2</sup>Korea Advanced Institute of Science and Technology, Korea, South; <sup>3</sup>University of Illinois at Urbana-Champaign, IL, United States*
- C5P-T.2 Fine Registration of 3D Point Clouds with Iterative Closest Point Using an RGB-D Camera.....2904**  
Jun Xie<sup>3</sup>, Yu-Feng Hsu<sup>2</sup>, Rogerio Feris<sup>1</sup>, Ming-Ting Sun<sup>3</sup>  
*<sup>1</sup>IBM T. J. Watson Research Center, United States; <sup>2</sup>Industrial Technology Research Institute, Taiwan; <sup>3</sup>University of Washington, United States*
- C5P-T.3 Influence of Camera Imaging Pipeline on Stereo-Matching Quality: an Experimental Study.....2908**  
Mihail Georgiev<sup>2</sup>, Atanas Gotchev<sup>2</sup>, Miska Hannuksela<sup>1</sup>  
*<sup>1</sup>Nokia Research Center, Finland; <sup>2</sup>Tampere University of Technology, Finland*
- C5P-T.4 Low Complexity Image Correction Using Color and Focus Matching for Stereo Video Coding .....2912**  
Wooseok Kim, Joohan Kim, Minsu Choi, Ik-Joon Chang, Jinsang Kim  
*Kyung Hee University, Korea, South*
- C5P-T.5 Reducing Computation Complexity for Disparity Matching.....2916**  
Kuan-Hung Chen<sup>1</sup>, Chin-Long Su<sup>2</sup>  
*<sup>1</sup>Feng-Chia University, Taiwan; <sup>2</sup>National Yunlin University of Science and Technology, Taiwan*

**C6P-N: Linear and Adaptive Filtering**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Poster Area

- C6P-N.1 New Algorithm for Minimax Design of Sparse IIR Filters .....298\$**  
Wu-Sheng Lu<sup>1</sup>, Takao Hinamoto<sup>2</sup>  
*<sup>1</sup> University of Victoria, Canada; <sup>2</sup> Hiroshima University, Japan*
- C6P-N.2 Design and Application of Allpass Filters with Equiripple Group Delay Errors.....2924**  
Xiaoping Lai<sup>1</sup>, Zhiping Lin<sup>2</sup>  
*<sup>1</sup>Hangzhou Dianzi University, China; <sup>2</sup>Nanyang Technological University, Singapore*
- C6P-N.3 Tracking Properties of Complex Adaptive Notch Filter for Detection of Multiple Real Sinusoids.....2928**  
Shotaro Nishimura<sup>2</sup>, Aloys Mvuma<sup>3</sup>, Takao Hinamoto<sup>1</sup>  
*<sup>1</sup>Hiroshima University, Japan; <sup>2</sup>Shimane University, Japan; <sup>3</sup>University of Dodoma, Japan*
- C6P-N.4 An Efficient Matrix Iterative Algorithm for the WLS Design of 2-D FIR Filters .....2932**  
Ruijie Zhao<sup>2</sup>, Xiaoping Lai<sup>1</sup>  
*<sup>1</sup>Hangzhou Dianzi University, China; <sup>2</sup>Shandong University at Weihai, China*
- C6P-N.5 Low-Complexity Two-Rate Based Multivariate Impulse Response Reconstructor for Time-Skew Error Correction in M-Channel Time-Interleaved ADCs .....2936**  
Anu Kalidas Muralidharan Pillai, Håkan Johansson  
*Linköping University, Sweden*

**C6P-P: Power Converters, Modeling, Dynamics, Control, and Driving II**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Herbert H.C. Iu, *University of Western Australia*  
Xiuqin Wei, *Fukuoka University*

---

- C6P-P.1 Detecting Bifurcation Types in DC-DC Switching Converters by Duplicate Symbolic Sequence .....2940**  
Lisa Yang<sup>1</sup>, Bo Zhang<sup>2</sup>, Fan Xie<sup>2</sup>, Herbert Ho-Ching Iu<sup>3</sup>, Wei Hu<sup>1</sup>  
<sup>1</sup>*Guangzhou University, China;* <sup>2</sup>*South China University of Technology, China;*  
<sup>3</sup>*University of Western Australia, Australia*
- C6P-P.2 Fast Transient Digitally Controlled Buck Regulator with Inductor Current Slew-Rate Boost .....2944**  
Ahmed Hashim, Bertan Bakkaloglu  
*Arizona State University, United States*
- C6P-P.4 A New Single-Stage AC-DC Converter for Medical Implant Devices .....2948**  
Yen-Chia Chu, N. Sertac Artan, Dariusz Czarkowski, H. Jonathan Chao  
*Polytechnic Institute of New York University, United States*
- C6P-P.5 Authentic Mode-Toggled Detector with Fast Transient Response Under Wide Load Range Buck-Boost Converter .....2952**  
Moris Lin<sup>1</sup>, Yung-Sheng Huang<sup>1</sup>, Andreas Ehrhart<sup>2</sup>, Yu-Huei Lee<sup>1</sup>, Chao-Chang Chiu<sup>1</sup>, Bernhard Wicht<sup>2</sup>, Ke-Horng Chen<sup>1</sup>  
<sup>1</sup>*National Chiao Tung University, Taiwan;* <sup>2</sup>*Reutlingen University, Germany*



**C6P-Q: Smart Grids and Sustainability II**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Chika Nwankpa, *Drexel University*

Luis F. C. Alberto, *University of Sao Paulo*

---

- C6P-Q.1 Macroscopic Broadband Loss Characteristics of Power Transformer Winding  
Extracted by Vector Fitting Method .....2956**  
Yiming Zheng, Zanji Wang  
*Tsinghua University, China*
- C6P-Q.2 Ultra-Low-Power Control Systems for Electrostatic Energy Harvesters .....2960**  
Marcelo Domingues, Antonio Carlos M. de Queiroz  
*Universidade Federal do Rio de Janeiro, Brazil*
- C6P-Q.3 A Study on MOSFET Rectifiers Maximum Output Voltage for RF Power  
Harvesting Circuits .....2964**  
Hugo Gonçalves, Jorge Fernandes, Miguel Martins  
*INESC-ID - Universidade Técnica de Lisboa, Portugal*
- C6P-Q.4 An Approach for Estimating Mode Shape for Participation of Inter-Area  
Oscillation Mode.....2968**  
Song Han<sup>1</sup>, Na Rong<sup>1</sup>, Ting Sun<sup>1</sup>, Jing Zhang<sup>2</sup>  
<sup>1</sup>*Guizhou University, China;* <sup>2</sup>*Zhejiang Power Grid Co., China*
- C6P-Q.5 On Measurement of Synchronous Phasors in Electrical Grids .....2972**  
Jan Kyncl, Adithya Hariram, Martin Novotny  
*Czech Technical University in Prague, Czech Rep.*
- C6P-Q.6 A Diffusive Electro-Equivalent Li-Ion Battery Model .....2976**  
Matteo Corno, Sergio Matteo Savaresi  
*Politecnico di Milano, Italy*

**C6P-R: Visual Recognition and Processing II**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Oscar Au, *Hong Kong University of Science & Technology*

Hongliang Li, *University of Electronic Science and Technology of China*

---

- C6P-R.1 Support-Driven Sparse Coding for Face Hallucination .....2980**  
Junjun Jiang<sup>2</sup>, Ruimin Hu<sup>2</sup>, Zhongyuan Wang<sup>2</sup>, Zixiang Xiong<sup>1</sup>, Zhen Han<sup>2</sup>  
<sup>1</sup>*Texas A&M University, United States;* <sup>2</sup>*Wuhan University, China*
- C6P-R.2 Improved Discriminant Nearest Feature Space Analysis for Variable Lighting  
Face Recognition .....2984**  
Shih-Ming Huang, Jar-Ferr Yang  
*National Cheng Kung University, Taiwan*
- C6P-R.3 An Empirical Approach for Digital Currency Forensics .....2988**  
Weiqi Yan, J Chambers  
*Auckland University of Technology, New Zealand*
- C6P-R.4 Adaptive Motion Estimation Order for Frame Rate Up-Conversion .....2992**  
Chengzhou Tang, Ronggang Wang, Wenmin Wang  
*Peking University, China*
- C6P-R.5 Data Hiding in Error Diffused Color Halftone Images .....2996**  
Yuanfang Guo, Oscar C. Au, Ketan Tang, Jiahao Pang, Wenxiu Sun, Lingfeng  
Xu, Jiali Li, Xingyu Zhang  
*Hong Kong University of Science and Technology, Hong Kong*

**C6P-S: Low-Power Circuits II**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Robert Chen-Hao Chang, *National Chung Hsing University*  
Volkan Kursun, *The Hong Kong University of Science and Technology*

---

- C6P-S.1 Novel Dual-Threshold-Voltage Energy-Efficient Buffers for Driving Large Extrinsic Load Capacitance .....3000**  
Hong Zhu, Volkan Kursun  
*Hong Kong University of Science and Technology, China*
- C6P-S.2 Efficient Approaches to Design a Reversible Floating Point Divider .....3004**  
Lafifa Jamal, Hafiz Md. Hasan Babu  
*University of Dhaka, Bangladesh*
- C6P-S.3 A 2 $\mu$ W Digital Baseband Core for Wireless Micro-Neural-Interface in 0.18 $\mu$ m CMOS .....3008**  
Ran Liao<sup>1</sup>, Chriswell Hutchens<sup>1</sup>, Robert Rennaker II<sup>2</sup>  
<sup>1</sup>*Oklahoma State University, United States*; <sup>2</sup>*University of Texas at Dallas, United States*
- C6P-S.4 Energy Reduction of Ultra-Low Voltage VLSI Circuits by Digit-Serial Architectures .....3012**  
Muhammad Umar Karim Khan, Chong Min Kyung  
*Korea Advanced Institute of Science and Technology, Korea, South*
- C6P-S.5 Scalable Low Power Digital Filter Architectures for Varying Input Dynamic Range .....3018**  
Sundarrajan Rangachari<sup>2</sup>, Nitin Chandrachoodan<sup>1</sup>  
<sup>1</sup>*Indian Institute of Technology Madras, India*; <sup>2</sup>*Indian Institute of Technology Madras & Texas Instruments India Pvt Ltd, India*

**C6P-T: Memory Circuits and Architectures III**

Time: Wednesday, May 22, 2013, 11:30 - 13:00

Room: Poster Area

Chairs: Xinmiao Zhang, *Case Western Reserve University*  
Pramod Kumar Meher, *Institute for Infocomm Research*

---

- C6P-T.1 A Dual-Core 8051 Microcontroller System Based on Synchronous-Logic and Asynchronous-Logic .....3022**  
Kok-Leong Chang<sup>1</sup>, Tong Lin<sup>2</sup>, Weng-Geng Ho<sup>2</sup>, Kwen-Siong Chong<sup>2</sup>, Bah-Hwee Gwee<sup>2</sup>, Joseph Chang<sup>2</sup>  
<sup>1</sup>Agency for Science, Technology and Research, Singapore; <sup>2</sup>Nanyang Technological University, Singapore
- C6P-T.2 Efficient Memory Access Methods for Framebuffer-Less Video Processing Applications .....3026**  
Chao-Yang Chang, Chung-Hsun Huang, Yuan-Sun Chu  
National Chung Cheng University, Taiwan
- C6P-T.3 A 0.4V 7T SRAM with Write Through Virtual Ground and Ultra-Fine Grain Power Gating Switches .....3030**  
Yuan Lin Yeoh<sup>1</sup>, Bo Wang<sup>1</sup>, Xiangyao Yu<sup>2</sup>, Tony Tae Hyoung Kim<sup>1</sup>  
<sup>1</sup>Nanyang Technological University, Singapore; <sup>2</sup>Tsinghua University, China
- C6P-T.4 High Throughput, Low Latency, Memory Optimized 64K Point FFT Architecture Using Novel Radix-4 Butterfly Unit .....3034**  
Kala S<sup>1</sup>, Nalesh S<sup>1</sup>, Arka Maity<sup>3</sup>, S K Nandy<sup>1</sup>, Ranjani Narayan<sup>2</sup>  
<sup>1</sup>Indian Institute of Science, Bangalore, India; <sup>2</sup>Morphing Machines Pvt.Ltd. Bangalore, India; <sup>3</sup>National Institute of Technology, Durgapur, India
- C6P-T.5 Balancing Adder for Error Tolerant Applications .....3038**  
Matthew Weber<sup>1</sup>, Mateja Putic<sup>1</sup>, Hang Zhang<sup>1</sup>, John Lach<sup>1</sup>, Jiawei Huang<sup>2</sup>  
<sup>1</sup>University of Virginia, USA; <sup>2</sup>NVIDIA Corp. CA