2013 IEEE International Symposium on Circuits and Systems

(ISCAS 2013)

Beijing, China
19-23 May 2013

Pages 1-768

IEEE Catalog Number: CFP13ISC-PRT
ISBN: 978-1-4673-5760-9

Copyright © 2013 by the Institute of Electrical and Electronic Engineers, Inc
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP13ISC-PRT
ISBN 13:	978-1-4673-5760-9
ISSN:	0271-4302

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

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*

A1L-A.1 **Image Search Reranking with Multi-Latent Topical Graph** 1
Junge Shen[3], Tao Mei[1], Qi Tian[2], Xinbo Gao[3]
[1]Microsoft Research Asia, China; [2]University of Texas at San Antonio, United States; [3]Xidian University, China

A1L-A.2 **Context-Dependent Audio-Visual and Temporal Features Fusion for TV Commercial Detection** 5
Bo Zhang[1], Jiancheng Zou[2], Bo Xu[1]
[1]Institute of Automation, Chinese Academy of Sciences, China; [2]North China University of Technology, China

A1L-A.3 **Quality Perception in 3D Interactive Environments** 9
Alexandre Ciancio[2], José Fernando de Oliveira[2], Felipe Lopes Ribeiro[2], Eduardo da Silva[2], Amir Said[1]
[1]HP Labs, United States; [2]Universidade Federal do Rio de Janeiro, Brazil

A1L-A.4 **A Gradient-Based Approach for Interference Cancelation in Systems with Multiple Kinect Cameras** 13
Sen Xiang[1], Li Yu[1], Qiong Liu[1], Zixiang Xiong[2]
[1]Huazhong University of Science and Technology, China; [2]Texas A&M University, United States

A1L-A.5 **Rate-Distortion Optimization for Depth Map Coding with Distortion Estimation of Synthesized View** 17
Li Wang, Lu Yu
Zhejiang University, China

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*
Hirotaka Koizumi, *Tokyo University of Science*

A1L-B.1 **Model and Design Considerations for Multistage Electrostatic Microgenerators 21**
Yin Li, Manjusri Misra, Stefano Gregori
University of Guelph, Canada

A1L-B.2 **A Self-Sustaining Integrated CMOS Regulator for Solar and UHF RFID Energy Harvesting Systems 25**
Tsung-Heng Tsai, Bo-Han Song
National Chung Cheng University, Taiwan

A1L-B.3 **Maximizing Efficiency Through Impedance Matching from a Circuit-Centric Model of Non-Radiative Resonant Wireless Power Transfer 29**
Elisenda Bou[1], Raymond Sedwick[2], Eduard Alarcon[1]
[1]Universitat Politècnica de Catalunya, Spain; [2]University of Maryland, College Park, United States

A1L-B.4 **A Reconfigurable Micro Power Solar Energy Harvester for Ultra-Low Power Autonomous Microsystems 33**
Naser Khosro Pour, Francois Krummenacher, Maher Kayal
École Polytechnique Fédérale de Lausanne, Switzerland

A1L-B.5 **Wide-Range, Reference Free, on-Chip Voltage Sensor for Variable Vdd Operations 37**
Delong Shang, Fei Xia, Alex Yakovlev
Newcastle University, United Kingdom

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*

A1L-C.1 **Multi Layer Based Rate Control Algorithm for HEVC 41**
Shanshe Wang[1], Siwei Ma[2], Li Zhang[2], Shiqi Wang[2], Debin Zhao[1], Wen Gao[2]
[1]Haerbin Institute of Technology, China; [2]Peking University, China

A1L-C.2 **Early Termination Schemes for Fast Intra Mode Decision in High Efficiency Video Coding 45**
Hao Zhang[1], Zhan Ma[2]
[1]Central South University, China; [2]Samsung Telecommunications America, United States

A1L-C.3 **HEVC-Based Adaptive Quantization for Screen Content by Detecting Low Contrast Edge Regions 49**
Hong Zhang, Oscar C. Au, Yongfang Shi, Xingyu Zhang, Ketan Tang, Yuanfang Guo
Hong Kong University of Science and Technology, Hong Kong

A1L-C.4 **Fast HEVC Intra Mode Decision Using Matching Edge Detector and Kernel Density Estimation Alike Histogram Generation 53**
Guang Chen[1], Zhenyu Liu[1], Takeshi Ikenaga[2], Dongsheng Wang[1]
[1]Tsinghua University, China; [2]Waseda University, Japan

A1L-C.5 **View Synthesis Prediction Using Skip and Merge Candidates for HEVC-Based 3D Video Coding 57**
Feng Zou, Dong Tian, Anthony Vetro
Mitsubishi Electric Research Laboratories, United States

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*

A1L-D.1 **A Cognitive Radio Receiver Front-End IC Based on Spread Spectrum Sensing Technique 61**
Ying Zhang, Ali Meaamar, Yuanjin Zheng
Nanyang Technological University, Singapore

A1L-D.2 **DOA-Estimation and Source-Localization in CR-Networks Using Steerable 2-D IIR Beam Filters 65**
Chamith Wijenayake[1], Arjuna Madanayake[1], Len Bruton[2], Vijay Devabhaktuni[3]
[1]University of Akron, United States; [2]University of Calgary, Canada; [3]University of Toledo, United States

A1L-D.3 **Papoulis-Gerchberg Hybrid Filter Bank Receiver for Cognitive-/Software-Defined Radio Systems 69**
José Pedro Magalhães[3], Teófilo Monteiro[3], José Manuel Neto Vieira[3], Roberto Gómez-García[2], Nuno Borges Carvalho[1]
[1]Instituto de Telecomunicações - Universidade de Aveiro, Portugal; [2]Universidad de Alcalá, Spain; [3]Universidade de Aveiro, Portugal

A1L-D.4 **Variable Increment Step Based Reconfigurable Interleaver for Multimode Communication Application 73**
Liang Tang, Jude Angelo Ambrose, Sri Parameswaran
University of New South Wales, Australia

A1L-D.5 **A Tunable Inductance Topology to Realize Frequency Tunable Matching Networks and Amplifiers 77**
Dogu Çagdas Atilla[2], Çagatay Aydin[2], Ramazan Köprü[1], Tayfun Nesimoglu[3], Bekir Sýddýk Yarman[2]
[1]Isik University, Istanbul Technical University, Turkey; [2]Isik University, Istanbul University, Turkey; [3]Middle East Technical University, Turkey

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, *Linkoping University*

A1L-E.1 **FIR Filter with Variable Fractional Delay and Phase Shift: Efficient Realization and Design Using Reweighted l1-Norm Minimization.....81**
Håkan Johansson, Amir Eghbali
Linköping University, Sweden

A1L-E.2 **Error Spectrum Shaping Approach for Lattice Filter Roundoff Noise Reduction.....85**
Yong Ching Lim[2], Chaogeng Huang[3], Gang Li[3], Hong Xu[3], Anthony G. Constantinides[1]
[1]Imperial College London, United Kingdom; [2]Nanyang Technological University, Singapore; [3]Zhejiang University of Technology, China

A1L-E.3 **Design of Two-Dimensional Notch Filter Using Bandpass Filter and Fractional Delay Filter 89**
Chien-Cheng Tseng[2], Su-Ling Lee[1]
[1]Chang Jung Christian University, Taiwan; [2]National Kaohsiung First University of Science and Technology, Taiwan

A1L-E.4 **Low-Complexity General FIR Filters Based on Winograd's Inner Product Algorithm 93**
Oscar Gustafsson, Andreas Ehliar
Linköping University, Sweden

A1L-E.5 **Sparse FIR Filter Design Based on Genetic Algorithm.....97**
Heng Zhao, Wenbin Ye, Yajun Yu
Nanyang Technological University, Singapore

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[2], Takahiro Hanyu[2], Noboru Sakimura[1], Tadahiko Sugibayashi[1]
[1]NEC Corporation, Japan; [2]Tohoku University, Japan

A1L-F.3 **A Comparative Study of STT-MTJ Based Non-Volatile Flip-Flops.....109**
Taehui Na[2], Kyungho Ryu[2], Jisu Kim[2], Seung Kang[1], Seong-Ook Jung[2]
[1]Qualcomm incorporated, United States; [2]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*

A1L-G.1 **Design of a Low-Power Pulse-Triggered Flip-Flop with Conditional Clock Technique 121**
Guangping Xiang, Jizhong Shen, Xuexiang Wu, Liang Geng
Zhejiang University, China

A1L-G.2 **A 32.4 μW RF Front End for 2.4 GHz Wake-Up Receiver 125**
Yu Lin Tsou, Nai-Chen Daniel Cheng, Christina F. Jou
Industrail Technique Research Institute, Taiwan

A1L-G.3 **A Dynamic-Adjusting Threshold-Voltage Scheme for FinFETs Low Power Designs 129**
Xiaoxin Cui, Kaisheng Ma, Kai Liao, Nan Liao, Di Wu, Wei Wei, Rui Li, Dunshan Yu
Peking University, China

A1L-G.4 **Near-/Sub-Vth Process, Voltage, and Temperature (PVT) Sensors with Dynamic Voltage Selection 133**
Ming-Hung Chang[2], Shang-Yuan Lin[2], Pei-Chen Wu[2], Olesya Zakoretska[2], Ching-Te Chuang[2], Kuan-Neng Chen[2], Chen-Chao Wang[1], Kua-Hua Chen[1], Chi-Tsung Chiu[1], Ho-Ming Tong[1], Wei Hwang[2]
[1]Advanced Semiconductor Engineering Group, Taiwan; [2]National Chiao Tung University, Taiwan

A1L-G.5 **Ultra-Low-Power High Sensitivity Spike Detectors Based on Modified Nonlinear Energy Operator 137**
Yang-Guo Li[1], Qingyun Ma[1], Mohammad Haider[1], Yehia Massoud[2]
[1]University of Alabama at Birmingham, United States; [2]Worcester Polytechnic Institute, United States

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*

A1L-H.1 **A Current-Mode Flash ADC for Low-Power Continuous-Time Sigma Delta Modulators 141**
Chang-Joon Park[2], Hemasundar Mohan Geddada[2], Aydin Ilker Karsilayan[2], Jose Silva-Martinez[2], Marvin Onabajo[1]
[1]Northeastern University, United States; [2]Texas A&M University, United States

A1L-H.2 **A Current Mode 6-bit Self-Clocked Tracking ADC with Adaptive Clock Frequency for DC-DC Converters 145**
Yan Huang[1], Horst Schleifer[2], Dirk Killat[1]
[1]Brandenburg university of technology, Germany; [2]Dialog Semiconductor, Germany

A1L-H.3 **A Frequency-Folded ADC Architecture with Digital LO Synthesis..... 149**
Travis Forbes, Wei-Gi Ho, Nan Sun, Ranjit Gharpurey
University of Texas at Austin, United States

A1L-H.4 **A Merged First and Second Stage for Low Power Pipelined ADC..... 153**
Changyi Yang, Weitao Li, Fule Li, Zhihua Wang
Tsinghua University, China

A1L-H.5 **High-Order Multi-Bit Incremental Converter with Smart-DEM Algorithm 157**
Yao Liu, Edoardo Bonizzoni, Franco Maloberti
Università degli Studi di Pavia, Italy

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*

A1L-J.1 **A Configurable Multi-Band GNSS Receiver for Compass/GPS/Galileo Applications 161**
Zhong Zhang, Weimin Li, Wu Wen, Wei Wu, Yongfeng Li
Beijing Microelectronics Technology Institute, China

A1L-J.2 **A Spur Cancellation Technique for MDLL-Based Frequency Synthesizers 165**
Giovanni Marzin, Andrea Fenaroli, Giovanni Marucci, Salvatore Levantino, Carlo Samori, Andrea Lacaita
Politecnico di Milano, Italy

A1L-J.3 **A Wide Bandwidth Fractional-N Synthesizer for LTE with Phase Noise Cancellation Using a Hybrid-Delta-Sigma-DAC and Charge Re-Timing 169**
Dawei Ye[2], Ping Lu[1], Pietro Andreani[1], Ronan van der Zee[2]
[1]Lund University, Sweden; [2]Universiteit Twente, Netherlands

A1L-J.4 **Minimum-Jitter Design of Bang-Bang PLLs in the Presence of $1/F^2$ and $1/F^3$ DCo Noise 173**
Giovanni Marucci, Salvatore Levantino, Paolo Maffezzoni, Carlo Samori
Politecnico di Milano, Italy

A1L-J.5 **Phase-Locked Loop Based PWM Wireless Transmitter 177**
Jingxue Lu, Ranjit Gharpurey
University of Texas at Austin, United States

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*

A1L-K.1 **A Highly Linear, Sigma-Delta Based, Sub-Hz High-Pass Filtered ExG Readout System 181**
Rachit Mohan[2], Senad Hiseni[1], Wouter A. Serdijn[1]
[1]Delft University of Technology, Netherlands; [2]Interuniversity Microelectronics Center, Belgium

A1L-K.2 **REFET Replication for ISFET-Based SNP Detection Arrays 185**
Mohammadreza Sohbati, Pantelis Georgiou, Christofer Toumazou
Imperial College London, United Kingdom

A1L-K.3 **A Direct-Capacitive Feedback ISFET Interface for pH Reaction Monitoring 189**
Yuanqi Hu, Pantelis Georgiou
Imperial College London, United Kingdom

A1L-K.4 **A Floating Active Inductor Based CMOS Cochlea Filter with High Tunability and Sharp Cut-Off 193**
Shiwei Wang[1], Thomas Jacob Koickal[1], Alister Hamilton[1], Enrico Mastropaolo[1], Rebecca Cheung[1], Leslie Smith[2]
[1]University of Edinburgh, United Kingdom; [2]University of Stirling, United Kingdom

A1L-K.5 **PLL-Based High-Speed Demodulation of FM Signals for Real-Time AFM Applications 197**
Benedikt Schlecker[2], Maurits Ortmanns[2], Jens Anders[2], Georg Fantner[1]
[1]Ecole Polytechnique Federale de Lausanne, Switzerland; [2]Universität Ulm, Germany

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[2], Zdenik Biolek[1], Viera Biolková[1], Zdenik Kolka[1]
[1]Brno University of Technology, Czech Rep.; [2]Brno University of Technology / University of Defence, Czech Rep.

A1L-L.2 **PSpice Switch-Based Versatile Memristor Model** **205**
Alon Ascoli[2], Ronald Tetzlaff[2], Fernando Corinto[1], Marco Gilli[1]
[1]Politecnico di Torino, Italy; [2]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[2], Tuanfa Qin[2], Wenbo Xu[1], Aidong Men[1]
[1]Beijing University of Posts and Telecommunications, China; [2]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[1], Oscar C. Au[1], Lu Fang[2], Lin Sun[1], Wenxiu Sun[1], Dinuka A. Soysa[1]
[1]Hong Kong University of Science and Technology, Hong Kong; [2]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[1], Oscar C. Au[1], Jingjing Fu[2], Yan Lu[2], Shipeng Li[2]
[1]Hong Kong University of Science and Technology, Hong Kong; [2]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*

A2L-B.1 **A Hybrid MPPT Method for Photovoltaic Systems via Estimation and Revision Method 241**
Jieming Ma[2], Ka Lok Man[3], Tiew On Ting[3], Nan Zhang[3], Chi-Un Lei[1], Ngai Wong[1]
[1]University of Hong Kong, Hong Kong; [2]University of Liverpool, United Kingdom; [3]Xi'an Jiaotong-Liverpool University, China

A2L-B.2 **Low-Cost Global MPPT Scheme for Photovoltaic Systems Under Partially Shaded Conditions 245**
Jieming Ma[2], Ka Lok Man[3], Tiew On Ting[3], Nan Zhang[3], Chi-Un Lei[1], Ngai Wong[1]
[1]University of Hong Kong, Hong Kong; [2]University of Liverpool, United Kingdom; [3]Xi'an Jiaotong-Liverpool University, China

A2L-B.3 **Distributed Control of Reactive Power from Photovoltaic Inverters 249**
Soumya Kundu[2], Scott Backhaus[1], Ian Hiskens[2]
[1]Los Alamos National Laboratory, United States; [2]University of Michigan, United States

A2L-B.4 **Battery-Assisted and Photovoltaic-Sourced Switched-Inductor CMOS Harvesting Charger—Supply 253**
Rajiv Damodaran Prabha, Gabriel Rincón-Mora
Georgia Institute of Technology, United States

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[2], Szu-Lu Hsu[2], Teng-Yuan Cheng[2], Chia-Han Lee[1], Shao-Yi Chien[2]
[1]Academia Sinica, Taiwan; [2]National Taiwan University, Taiwan

A2L-C.2 **Multiple Description Coding with Randomly Offset Quantizers 261**
Lili Meng[1], Jie Liang[4], Upul Samarawickrama[3], Yao Zhao[1], Huihui Bai[1], Andre Kaup[2]
[1]Beijing Jiaotong University, China; [2]Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; [3]Microsoft Corporation, United States; [4]Simon Fraser University, Canada

A2L-C.3 **Improved Hierarchial 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[2], Lin Wang[2], Guanrong Chen[1]
[1]City University of Hong Kong, Hong Kong; [2]Xiamen University, China

A2L-D.2 **Forward Error Correction with RaptorQ Code on GPU 281**
Linjia Hu[2], Saeid Nooshabadi[2], Todor Mladenov[1]
[1]Intel, Germany; [2]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[2], Harshavardhan Kittur[2], Håkan Andersson[1], Viktor Öwall[2]
[1]Ericsson AB, Sweden; [2]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[1], Shamima Najnin[1], Shaikh Anowarul Fattah[1], Wei-Ping Zhu[2], M. Omair Ahmad[2]
[1]Bangladesh University of Engineering and Technology, Bangladesh; [2]Concordia University, Canada

A2L-E.2 **Improved Structural Similarity Measurement for Vocal Signals 301**
Wei-Sheng Lai[2], Chi-Jung Tseng[1], Jian-Jiun Ding[2]
[1]Chihlee Institute of Technology, Taiwan; [2]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[2], Ian O'Connor[2], Zhen Li[2], Xavier Letartre[2], Christelle Monat[2], Jelena Trajkovic[1], Gabriela Nicolescu[3]
[1]Concordia University, Canada; [2]École Centrale de Lyon, France; [3]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[3], Anteo Smerieri[2], Yvan Paquot[2], Bendix Schneider[1], Joni Dambre[1], Benjamin Schrauwen[1], Marc Haeltermann[2], Serge Massar[2]
[1]Gent University, Belgium; [2]Université Libre de Bruxelles, Belgium; [3]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[2], Suk Joong Huh[1], Milos Ercegovac[2]
[1]Samsung Electronics, Korea, South; [2]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 0.4mm² 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[1], Fabio Rabuske[2], Jorge Fernandes[1], Cesar Rodrigues[2]
[1]INESC-ID - Universidade Técnica de Lisboa, Portugal; [2]Universidade Federal de Santa Maria / GMicro, Brazil

A2L-H.4 **Rigorous Analysis of Quantization Error of an A/D Converter Based on ß-Map 369**
Takaki Makino[4], Yukiko Iwata[1], Yutaka Jitsumatsu[2], Masao Hotta[3], Hao San[3], Kazuyuki Aihara[4]
[1]FIRST, Aihara Innovative Mathematical Modelling Project, Japan Science and Technology Agency, Japan; [2]Kyushu University, Japan; [3]Tokyo City University, Japan; [4]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*

A2L-J.1 **Linearization of Subthreshold Low-Noise Amplifiers 377**
Chun-Hsiang Chang, Marvin Onabajo
Northeastern University, United States

A2L-J.2 **Frequency Compensation of High-Speed, Low-Voltage CMOS Multistage Amplifiers 381**
Syed Ahmed Aamir[2], Prakash Harikumar[1], Jacob Wikner[1]
[1]Linköping University, Sweden; [2]Universität Bielefeld, Germany

A2L-J.3 **1V Rail-to-Rail Constant Gm Amplifier with Common-Mode Elimination Technique 385**
Boram Lee, Ted Higman
University of Minnesota, United States

A2L-J.4 **An Inductorless Wideband Low Noise Amplifier with Current Reuse and Linearity Enhancement 389**
Chuan Qin[2], Lei Zhang[2], Yan Wang[2], Zhiping Yu[2], Dajie Zeng[1]
[1]Suzhou Institute of Nano-Tech and Nano-Bionics, China; [2]Tsinghua University, China

A2L-J.5 **A Current-Mirror Opamp with Switchable Transconductances for Low-Power Switched-Capacitor Integrators 393**
Mostafa Haroun, Anas Hamoui
McGill University, Canada

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, Herming Chiueh
National Chiao Tung University, Taiwan

A2L-K.2 **A Bidirectional Neural Interface with a HV Stimulator and a LV Neural Amplifier 401**
Ulrich Bihr, Thomas Ungru, Hongcheng Xu, Jens Anders, Joachim Becker, Maurits Ortmanns
Universität Ulm, Germany

A2L-K.3 **A 1.83 µW, 0.78 µVrms 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*

A2L-L.1 **Memristor—Based Neural Circuits** **417**
Fernando Corinto[1], Alon Ascoli[1], Sung-Mo Kang[2]
[1]Politecnico di Torino, Italy; [2]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[1], Themistoklis Prodromakis[1], Ali Khiat[1], Iulia Salaoru[1], Christofer Toumazou[1], Fernando Perez-Diaz[2], Eleni Vasilaki[2]
[1]Imperial College London, United Kingdom; [2]University of Sheffield, United Kingdom

A2L-L.4 **Analysis of Multi-Memristor Circuits** **429**
Ute Feldmann[2], Torsten Schmidt[1], Ronald Tetzlaff[2]
[1]Hochschule Ansbach, Germany; [2]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*

A3L-A.1 **A Fast Rate Adaptation Scheme for SVC Based on the Packet Dependencies 433**
Maodong Li[2], Zhenzhong Chen[1], Seong-Ping Chuah[2], Yap-Peng Tan[2]
[1]MediaTek USA Inc., United States; [2]Nanyang Technological University, Singapore

A3L-A.2 **Lifetime Elongation of Event-Driven Wireless Video Sensor Networks.....437**
Jeonghoon Jang, Giwon Kim, Chong Min Kyung
Korea Advanced Institute of Science and Technology, Korea, South

A3L-A.3 **Adaptive Mode and Modulation Coding Switching Scheme in MIMO Multicasting System.....441**
Xiang Chen[3], Jenq-Neng Hwang[3], Po-Han Wu[3], Hsuan-Jung Su[2], Chung-Nan Lee[1]
[1]National Sun Yat-Sen University, Taiwan; [2]National Taiwan University, Taiwan; [3]University of Washington, United States

A3L-A.4 **A Collusion-Free Key Assignment Scheme for Hierarchical Access Control Using Recursive Hash Chains 445**
Shoko Imaizumi
Chiba University, Japan

A3L-A.5 **Optimal Resource Allocation for Multimedia Application Providers in Multi-Site Cloud 449**
Xiaoming Nan, Yifeng He, Ling Guan
Ryerson University, Canada

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*

A3L-B.1 **Identifying Groups of Preventive Controls for a Set of Critical Contingencies in the Context of Voltage Stability 453**
Moussa Mansour, Luís Fernando Alberto, Rodrigo Ramos, Alexandre Delbem
Universidade de São Paulo, Brazil

A3L-B.2 **Practical Stability Assessement of Distributed Synchronous Generators Under Load Variations 457**
Roman Kuiava[2], Rodrigo Ramos[1], Luís Fernando Alberto[1], Hemanshu Pota[3]
[1]Universidade de São Paulo, Brazil; [2]Universidade Federal do Paraná, Brazil; [3]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[2], Hsiao-Dong Chiang[1]
[1]Cornell University, United States; [2]Tianjin University, China

A3L-B.4 **BCS: a Binary Cuckoo Search Algorithm for Feature Selection 465**
Douglas Rodrigues[3], Luis Pereira[3], Thiago Almeida[3], Joao Paulo Papa[3], Andre Souza[3], Caio Ramos[2], Xin-She Yang[1]
[1]Middlesex University, United Kingdom; [2]Universidade de São Paulo, Brazil; [3]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[2], Jizheng Xu[1], Dong Zhang[2], Houqiang Li[2]
[1]Microsoft Research Asia, China; [2]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[2], Jizheng Xu[1], Houqiang Li[2]
[1]Microsoft Research Asia, China; [2]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[1], Yanwei Liu[1], Jinxia Liu[2], Ruixiao Yao[1], Song Ci[1], Hui Tang[1]
[1]Institute of Acoustics, Chinese Academy of Sciences, China; [2]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[3], Purushotham Murugappa[2], Guy Gogniat[3], Amer Baghdadi[2], Jean-Philippe Diguet[3], Jean-Noel Bazin[2], Michael Hübner[1]
[1]Ruhr-Universität Bochum, Germany; [2]Télécom Bretagne, France; [3]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[2], C.-H. Peng[1], Chao Lu[2], Yaopei Chang[2], Richard Huang[2], Andy Chang[1], Genie Shih[1], Ray Hsu[1], Paul C. P. Liang[1], Sangwon Son[2], Ali Niknejad[3], George Chien[1], CL Tsai[1], HC Hwang[1]
[1]MediaTek Inc., Taiwan; [2]MediaTek USA Inc., United States; [3]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[1], Shimao Xiao[1], Yunfeng Yu[1], Wei Huang[1], Wenguang Pan[1], Tianchun Ye[1], Min Qian[2], Xiaofeng He[2], Chengyan Ma[2]
[1]Institute of Microelectronics of Chinese Academy of Sciences, China; [2]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[3], Konstantinos Slavakis[4], Sergios Theodoridis[2], Stephen McLaughlin[1]
[1]Heriot Watt University, United Kingdom; [2]University of Athens, Greece; [3]University of Granada, Spain; [4]University of Minnesota, United States

A3L-E.2 **New Constrained Affine-Projection Adaptive-Filtering Algorithm 517**
Md. Zulfiquar Ali Bhotto, Andreas Antoniou
University of Victoria, Canada

A3L-E.3 **New Proportionate Affine Projection Sign Algorithms 521**
Felix Albu[2], Hon Keung Kwan[1]
[1]University of Windsor, Canada; [2]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[2], Chandrashekar Radhakrishnan[3], Danielle Sova[1]
[1]George Mason University, United States; [2]Pennsylvania State University, United States; [3]University of Illinois, United States

A3L-E.5 **Acoustic Feedback Neutralization in Digital Hearing Aids - a Two Adaptive Filters-Based Solution 529**
Muhammad Akhtar[2], Akinori Nishihara[1]
[1]Tokyo Institute of Technology, Japan; [2]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[1], Siddharth Garg[2], Diana Marculescu[1]
[1]Carnegie Mellon University, United States; [2]University of Waterloo, Canada

A3L-F.4 **Exploring Early Design Tradeoffs in 3DIC 545**
Paul Franzon[1], Shivam Priyadarshi[1], Steve Lipa[1], Rhett Davis[1], Thor Thorolfsson[2]
[1]North Carolina State University, United States; [2]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[2], Olivier Billoint[1]
[1]CEA LETI, France; [2]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[1], Mario Auer[1], Wolfgang Pribyl[1], Günter Hofer[2], Gerald Holweg[2]
[1]Graz University of Technology, Austria; [2]Infineon Technologies Austria AG, Austria

A3L-G.4 **Ultra Low Power NEMFET Based Logic 566**
Marius Enachescu[1], Mihai Lefter[1], Antonios Bazigos[2], Adrian M. Ionescu[2], Sorin Dan Cotofana[1]
[1]Delft University of Technology, Netherlands; [2]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*

A3L-H.1 **A DAC Cell with Improved ISI and Noise Performance Using Native Switching for Multi-bit CT Delta Sigma Modulators 574**
John G. Kauffman, Rudolf Ritter, Chao Chu, Maurits Ortmanns
Universität Ulm, Germany

A3L-H.2 **Modeling and Analysis of Aliasing Image Spurs Problem in Digital-RF-Converter-Based IQ Modulators 578**
Reza Sadeghifar, Jacob Wikner
Linköping University, Sweden

A3L-H.3 **Background Adaptive Linearization of High-Speed Digital-to-Analog Converters 582**
Andrea Fenaroli, Salvatore Levantino, Carlo Samori, Andrea Lacaita
Politecnico di Milano, Italy

A3L-H.4 **A Low Power 1-MHz Continuous-Time Sigma-Delta Modulator Using a Passive Loop Filter Designed with a Genetic Algorithm Tool 586**
João Luís Alvernaz de Melo
UNINOVA/CTS - Universidade Nova de Lisboa, Portugal

A3L-H.5 **A Distortion Corrected Passive RC Noise Shaping ADC for Biomedical Applications 590**
Luis Hernandez, Enrique Prefasi, Susana Paton
Universidad Carlos III de Madrid, Spain

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*

A3L-J.1 **A Switched Gain Cell Parametric Amplifier 594**
Chutham Sawigun, Amorn Jiraseree-Amornkun
Mahanakorn University of Technology, Thailand

A3L-J.2 **A Design Methodology to Achieve Low Input Impedance and Non-Constant Gain-Bandwidth Product in TIAs for Optical Communication 598**
Seungwoo Jung[1], John Cressler[1], Jeff Babcock[2], Greg Cestra[2], Alan Buchholz[2]
[1]Georgia Institute of Technology, United States; [2]Texas Instruments, United States

A3L-J.3 **A 94% Efficiency Near-Constant Frequency Self-Oscillating Class-D Audio Amplifier with Voltage Control Resistor 602**
Shao Siang Ng[1], Kuei-Liang Lin[1], Ke-Horng Chen[1], Yu-Wen Chen[2]
[1]National Chiao Tung University, Taiwan; [2]Vanguard International Semiconductor Corp., Taiwan

A3L-J.4 **A Fully Differential CMOS Self-Biased Two-Stage Preamplifier-Latch Threshold Detection Comparator 606**
Vladimir Milovanovic, Horst Zimmermann
Technische Universität Wien, Austria

A3L-J.5 **RF Current Mode Class-D Power Amplifiers Under Periodic and Non-Periodic Switching Conditions 610**
Sadegh Abbasian, Thomas Johnson
University of British Columbia, Canada

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-µm 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 Elikaee, 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[1], Kea-Tiong Tang[1], Guoxing Wang[2]
[1]National Tsing Hua University, Taiwan; [2]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[1], Toshihiko Noda[1], Kiyotaka Sasagawa[1], Takashi Tokuda[1], Yasuo Terasawa[2], Hironari Kanda[3], Takashi Fujikado[3]
[1]Nara Institute of Science and Technology, Japan; [2]Nidek, Japan; [3]Osaka University, Japan

A3L-L.4 **Capacitive-Data Links, Energy-Efficient and High-Voltage Compliant Visual Intracortical Microstimulation System** 646
Md. Hasanuzzaman[2], Guillaume Simard[2], Nedialko Krouchev[2], Rabin Raut[1], Mohamad Sawan[2]
[1]Concordia University, Canada; [2]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[1], Marco Mattavelli[1], Jorn Janneck[2]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]Lund University, Sweden

A4P-N.3 **A Low-Cost Scalable Voltage-Frequency Adjustor for Implementing Low-Power Systems.....655**
Ching-Hwa Cheng[1], Sheng-Wei Hsu[1], Jiun-In Guo[2]
[1]Feng-Chia University, Taiwan; [2]National Chiao Tung University, Taiwan

A4P-N.4 **Live Demonstration: Real-Time Audio Restoration Using Sparse Signal Recovery 659**
David Bellasi[2], Patrick Maechler[2], Andreas Burg[1], Norbert Felber[2], Hubert Kaeslin[2], Christoph Studer[3]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]ETH Zürich, Switzerland; [3]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[2], Jonathan Tapson[2], André van Schaik[2], Alistair McEwan[1], Aravinda Thiagalingam[1]
[1]University of Sydney, Australia; [2]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[2], WeiDong Liu[2], Jiang Du[1]
[1]Chengdu University of Information Technlogy, China; [2]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[1], Siu-Chung Wong[1], Siew-Chong Tan[2]
[1]Hong Kong Polytechnic University, Hong Kong; [2]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 Ngi 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[1], King-To Ng[1], Shing-Chow Chan[1], Xiao-Wei Song[2]
[1]University of Hong Kong, Hong Kong; [2]Zhongyuan University of Technology, China

B1L-C.2 **Object Segmentation from Wide Baseline Video 717**
Chunhui Cui[1], Qian Zhang[2], King Ngi Ngan[2]
[1]Applied Science and Technology Research Institute, China; [2]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[1], Xinbo Xiang[1], Harald Pretl[2]
[1]Carinthia University of Applied Sciences, Austria; [2]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[1], In-Chul Hwang[3], Ara Cho[3], Sangyub Lee[2]
[1]Hannam University, Korea, South; [2]I&C Technology, Inc., Korea, South; [3]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[2], Tyson Tian Qin[2], Dinesh Pamunuwa[2], Daniel Grogg[1], Michel Despont[1], Yu Pu[1], Christoph Hagleitner[1]
[1]IBM Research - Zurich Laboratory, Switzerland; [2]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*

B1L-H.1 **A Voltage Scaling 0.25-1.8 V Delta-Sigma Modulator with Inverter-Opamp Self-Configuring Amplifier 809**
Kentaro Yoshioka, Yosuke Toyama, Teruo Jyo, Hiroki Ishikuro
Keio University, Japan

B1L-H.2 **A 1-V 100-dB Dynamic Range 24.4-kHz Bandwidth Delta-Sigma Modulator 813**
Chia-Ling Chang, Jieh-Tsorng Wu
National Chiao Tung University, Taiwan

B1L-H.3 **A Low-Power, Ultra Low-Offset, 16.5-bit, Sigma-Delta ADC for Coulomb Counting and Fuel Gauge Applications 817**
Jose Luis Ceballos, Christian Reindl
Infineon Technologies Austria AG, Austria

B1L-H.4 **Design of a Third-Order Sigma-Delta Modulator with Minimum Op-Amps Output Swing 821**
Oscar Belotti, Edoardo Bonizzoni, Franco Maloberti
Università degli Studi di Pavia, Italy

B1L-H.5 **An Empirical and Statistical Comparison of State-of-the-Art Sigma-Delta Modulators 825**
José M. de la Rosa
CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain

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*

B1L-J.1 **Mathematical Analysis of Inter-Band Intermodulation for Concurrent Dual-Band Mixers 829**
Yifei Li, Nathan Neihart
Iowa State University, United States

B1L-J.2 **Nonlinearity Analysis of R-2R Ladder-Based Current-Steering Digital to Analog Converter 833**
Chun-Chieh Chen, Nan-Ku Lu
Chung Yuan Christian University, Taiwan

B1L-J.3 **A Fully Integrated Video Digital-to-Analog Converter with Minimized Gain Error 837**
Tao Zhang, Qiaoyan Yu
University of New Hampshire, United States

B1L-J.4 **Two-Stage Charge Sensitive Amplifier with Self-Biased MOS Transistor as Continuous Reset System 841**
Yacong Zhang, Xiaolu Chen, Zhongjian Chen, Wengao Lu
Peking University, China

B1L-J.5 **A SiGe 8-Channel Comparator for Application in a Synthetic Aperture Radiometer 845**
Erik Ryman[2], Stefan Back Andersson[2], Johan Riesbeck[2], Slavko Dejanovic[2], Anders Emrich[2], Per Larsson-Edefors[1]
[1]Chalmers University of Technology, Sweden; [2]Omnisys Instruments AB, Sweden

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*

B1L-K.1 **A 1.52 uJ/Classification Patient-Specific Seizure Classification Processor Using Linear SVM 849**
Muhammad Awais Bin Altaf, Jerald Yoo
Masdar Institute of Science and Technology, U.A.E.

B1L-K.2 **Similarity-Index Early Seizure Detector VLSI Architecture 853**
Amogh Vidwans, Karim Abdelhalim, Roman Genov
University of Toronto, Canada

B1L-K.3 **Low-Power Multi-Processor System Architecture Design for Universal Biomedical Signal Processing 857**
Li-Fang Cheng, Tung-Chien Chen, Liang-Gee Chen
National Taiwan University, Taiwan

B1L-K.4 **Reconfigurable Biological Signal Co-Processor for Feature Extraction Dedicated to Implantable Biomedical Microsystems 861**
Sedigheh Razmpour, Amir Masoud Sodagar, Milad Faizollah, Mohammad Yousef Darmani, Morteza Nourian
K.N.Toosi University of Technology, Iran

B1L-K.5 **System Level Model for Transcutaneous Optical Telemetric Link 865**
Tianyi Liu, Jens Anders, Maurits Ortmanns
Universität Ulm, Germany

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[2], Lingyu Duan[2], Jun Sun[2], Junsong Yuan[1], Yonggang Wen[1], Yap-Peng Tan[1], Jianfei Cai[1], Alex C. Kot[1]
[1]Nanyang Technological University, Singapore; [2]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[2], Xueming Qian[2], Ke Lan[2], Lei Zhang[1], Tao Mei[1]
[1]Microsoft Research Asia, China; [2]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[1], Myung Hoon Sunwoo[1], Sung Dae Kim[2]
[1]Ajou University, Korea, South; [2]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[3], Yingjie Chen[3], Shouyi Yin[3], Dong Wang[3], Xing Wang[3], Shaojun Wei[3], Li Zhou[1], Hao Lei[4], Peng Cao[2]
[1]Chinese Academy of Sciences, China; [2]Southeast University, China; [3]Tsinghua University, China; [4]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[2], Tomoharu Nagashima[1], Hiroo Sekiya[1], Tadashi Suetsugu[2]
[1]Chiba University, Japan; [2]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[2], Chia-Lung Ni[2], Jen-Chieh Tsai[2], Yi-Ting Chen[2], Chun-Yen Chen[2], Ke-Horng Chen[2], Long-Der Chen[1], Cheng-Chen Yang[1]
[1]Industrial Technology Research Institute, Taiwan; [2]National Chiao Tung University, Taiwan

B2L-B.4 **Switching and Conduction Loss Analysis of Buck Converters Operating in DCM-Only Scenarios 921**
Wei Fu[2], Siang Tan[3], Ayman Fayed[1]
[1]Iowa State University, United States; [2]Iowa State University and Texas Instruments Inc., United States; [3]Texas Instruments, United States

B2L-B.5 **Bifurcation Analysis in Dual-Input Buck Converter in Hybrid Power System 925**
Xiaoling Xiong[2], Chi Kong Michael Tse[1], Xinbo Ruan[2], Meng Huang[1]
[1]Hong Kong Polytechnic University, Hong Kong; [2]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[1], Qi Sun[2], Xiangxu Meng[1], Jingliang Peng[1]
[1]Shandong University, China; [2]Taishan College, Shandong University, China

B2L-C.2 **Visual Masking Estimation Based on Structural Uncertainty 933**
Jinjian Wu[2], Weisi Lin[1], Guangming Shi[2]
[1]Nanyang Technological University, Singapore; [2]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[2], Tughrul Arslan[2], Khaled Benkrid[2], Ahmed El-Rayis[1], Nakul Haridas[1]
[1]Sofant Technologies, United Kingdom; [2]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[1], Baoyong Chi[1], Meng Wei[1], Albert Wang[2], Tianling Ren[1], Zhihua Wang[1]
[1]Tsinghua University, China; [2]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[1], Eric Lim[2], Takefumi Yoshikawa[2], Tony Tae Hyoung Kim[1]
[1]Nanyang Technological University, Singapore; [2]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*

B2L-E.1 **A Novel Region Merging Based Image Segmentation Approach for Automatic Object Extraction 970**
Lin Zha, Zhi Liu, Shuhua Luo, Liquan Shen
Shanghai University, China

B2L-E.2 **HTS: a New Shape Descriptor Based on Hough Transform 974**
Gustavo Botelho de Souza, Aparecido Nilceu Marana
Universidade Estadual Paulista, Brazil

B2L-E.3 **Gradient Local Binary Patterns for Human Detection 978**
Ning Jiang, Jiu Xu, Wenxin Yu, Satoshi Goto
Waseda University, Japan

B2L-E.4 **Segmentation of Low-Altitude Aerial Images of Non-Urban Environment Based on Perceptual Grouping of Edges ..... N/A**
Babak Majidi, Jagdish Patra, Jinchuan Zheng
Swinburne University of Technology, Australia

B2L-E.5 **Segmenting Specific Object Based on Logo Detection 986**
Fanman Meng, Hongliang Li, Guanghui Liu
University of Electronic Science and Technology of China, China

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, Shanghang 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*

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[2], Sukeshwar Kannan[2], Bruce Kim[2], Sang-Bock Cho[1]
[1]Ulsan University, Korea, South; [2]University of Alabama, United States

B2L-G.5 **Evolution of Graphics Northbridge Debug Bus Architecture Across Four Generations of AMD SoCs ..... N/A**
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*

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[1], Chadi Jabbour[1], Cyrius Ouffoue[1], Rayan Mina[2], Florent Sibille[2], Patrick Loumeau[1], Pascal Triaire[2], Van Tam Nguyen[1]
[1]Institute Mines-Telecom, Telecom ParisTech, France; [2]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[2], Susana Paton[2], Luis Hernandez[2], Enrique Prefasi[2], Maria Presicce[1], Gerhard Paoli[1]
[1]Lantiq, Austria; [2]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[1], Yiannos Manoli[1], Matthias Keller[2]
[1]Albert-Ludwigs-Universität Freiburg, Germany; [2]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[1], Eduardo Picatoste[1], Carlos Abellan Beteta[1], Eugeni Graugés[1], Lluis Garrido[1], Xavier Vilasís-Cardona[2], Frederic Machefert[4], Olivier Duarte[3], Jacques Lefrançois[3]
[1]ECM and ICC - Universitat de Barcelona, Spain; [2]La Salle - Ramon Llull University, Spain; [3]LAL - Université de Paris-Sud, France; [4]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[1], Fei Yao[1], Li Wang[4], Rui Ma[4], Chen Zhang[4], Zongyu Dong[4], Albert Wang[5], Zitao Shi[2], Yuhua Cheng[2], Baoyong Chi[3], Tianling Ren[3]
[1]Citruscom Semiconductor, China; [2]Peking University, United States; [3]Tsinghua University, China; [4]University of California, United States; [5]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*

B2L-K.1 **A Portable Lab-on-Chip Platform for Magnetic Beads Density Measuring.....1071**
Yushan Zheng[1], Cyril Jacquemod[2], Mohamad Sawan[1]
[1]École Polytechnique de Montréal, Canada; [2]Polytechnique Montréal, Canada

B2L-K.2 **Characterization of Standard CMOS Compatible Photodiodes and Pixels for Lab-on-Chip Devices 1075**
Gözen Köklü[1], Ralph Etienne-Cummings[2], Yusuf Leblebici[1], Giovanni De Micheli[1], Sandro Carrara[1]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]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 Shayei, 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*

B2L-L.1 **Overview of Quality Assessment for Visual Signals and Newly Emerged Trends 1091**
Lin Ma[2], Chenwei Deng[1], King Ngi Ngan[2], Weisi Lin[3]
[1]Beijing Institute of Technology, China; [2]Chinese University of Hong Kong, Hong Kong; [3]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[1], Ingrid Heynderickx[1], Bruno Macchiavello[2], Mylene Farias[2]
[1]Delft University of Technology, Netherlands; [2]Universidade de Brasília, Brazil

B3L-A: Millimeter-wave & Optical Communications Circuits

Time: Tuesday, May 21, 2013, 14:30 - 16:00
Room: Room 301A
Chair: Jaehyouk Choi, *Ulsan National Institute of Science & Technology*

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-μm CMOS 1115**
Dong-Wook Kim[2], Han-Kyu Chi[2], Yu-Sang Chun[2], Myung-Heon Chin[2], Gyungock Kim[1], Deog-Kyoon Jeong[2]
[1]ETRI, Korea, South; [2]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[2], Na Yan[2], Qiang Chen[2], Jianjun Gao[1], Xiaoyang Zeng[2]
[1]East China Normal University, China; [2]Fudan University, China

B3L-A.5 **Inductorless, Power-Proportional, Optical Receiver Front-End in TSMC 90 nm..... 1127**
Partha Dash[1], Glenn Cowan[1], Odile Liboiron-Ladouceur[2]
[1]Concordia University, Canada; [2]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[1], Rueywen Liu[2], Fan He[1], Tao Yang[1], Bo Hu[1]
[1]Fudan University, China; [2]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[2], Feng Wu[1], Jizheng Xu[1], Wen Gao[2]
[1]Microsoft Research Asia, China; [2]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.*

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[2], Ni Xu[2], Jun Li[3], Xueyi Yu[1], Woogeun Rhee[2], Zhihua Wang[2]
[1]Marvell, Shanghai, China; [2]Tsinghua University, China; [3]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*

B3L-E.1 **Fast Single Frame Super-Resolution Using Scale-Invariant Self-Similarity 1191**
Luhong Liang[1], King Hung Chiu[1], Edmund Y. Lam[2]
[1]Hong Kong Applied Science and Technology Research Institute, Hong Kong; [2]University of Hong Kong, Hong Kong

B3L-E.2 **Spatially-Varying Super-Resolution for HDTV 1195**
Chih-Tsung Shen[2], Hung-Hsun Liu[1], Ming-Sui Lee[2], Yi-Ping Hung[2], Soo-Chang Pei[2]
[1]Chunghwa Telecom, Taiwan; [2]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[2], Yajing Chen[2], Ronald Dreslinski[2], Chaitali Chakrabarti[1], Achilleas Anastasopoulos[2], Scott Mahlke[2], Trevor Mudge[2]
[1]Arizona State University, United States; [2]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*

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[1], Fang Cai[1], M.P Anantram[2]
[1]Case Western Reserve University, United States; [2]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[1], Guangyu Sun[1], Tao Wang[1], Yuan Xie[2], Jason Cong[3]
[1]Peking University, China; [2]Pennsylvania State University, United States; [3]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[1], Tadashi Shibata[2], Tetsuo Endoh[1]
[1]Tohoku University, Japan; [2]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*

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[1], Stefan Haenzsche[1], Johannes Görner[1], Rene Schüffny[1], Thomas Reichel[2], Lars Göpfert[2], Valeri Razhenikov[2]
[1]Technische Universität Dresden, Germany; [2]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[2], Gordana Jovanovic Dolecek[2], José M. de la Rosa[1]
[1]CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain; [2]Institute, INAOE, Mexico

B3L-H.4 **Calculating Transfer Functions of CT Sigma-Delta Modulators with Arbitrary DAC Waveforms 1264**
Timon Brückner[2], Martin Kiebler[2], Matthias Lorenz[2], Christoph Zorn[1], Wolfgang Mathis[1], Maurits Ortmanns[2]
[1]Leibniz University of Hannover, Germany; [2]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*

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[1], Arjuna Madanayake[1], Yongsheng Xu[2], Leonid Belostotski[2], Len Bruton[2]
[1]University of Akron, United States; [2]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[1], Stefano D'Amico[2], Giuseppe Cocciolo[2], Marco De Blasi[2], Andrea Baschirotto[1]
[1]Università degli Studi di Milano - Bicocca, Italy; [2]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[3], Antonio J. Lopez-Martin[3], Jaime Ramirez-Angulo[1], Ramon G. Carvajal[2]
[1]New Mexico State University, United States; [2]Universidad de Sevilla, Spain; [3]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*

B3L-K.1 **Error Correction Algorithm for High Accuracy Bio-Impedance Measurement in Wearable Healthcare Applications 1292**
Rajkumar Chinnakonda Kubendran[2], Sunyoung Kim[1], Refet Firat Yazicioglu[1]
[1]IMEC, Belgium; [2]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[1], Yau Wong[1], Raimund Ober[2]
[1]Nanyang Technological University, Singapore; [2]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[1], A. B. M. Sayeed Ud Doulah[1], Md. Asif Iqbal[1], Celia Shahnaz[1], Wei-Ping Zhu[2], M. Omair Ahmad[2]
[1]Bangladesh University of Engineering and Technology, Bangladesh; [2]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*

B3L-L.1 **Extracting Underlying Trend and Predicting Power Usage via Joint SSA and Sparse Binary Programming 1312**
Zhijing Yang[1], Wing-Kuen Ling[1], Chris Bingham[2]
[1]Guangdong University of Technology, China; [2]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[1], Yuk Ming Lai[1], Ka Hong Loo[1], Chi Kong Michael Tse[1], Xinbo Ruan[2]
[1]Hong Kong Polytechnic University, Hong Kong; [2]Nanjing University of Aeronautics and Astronautics, China

B3L-L.4 **Stability Issues in Cascade Connected Switching Converters for DC Microgrid Applications 1324**
Reham Haroun[2], Abdelali El Aroudi[1], Angel Cid-Pastor[2], Luis Martinez-Salamero[2]
[1]Univeristat Rovira i Virgili, Spain; [2]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*

B4L-A.1 **Low-Complexity Finite Alphabet Iterative Decoders for LDPC Codes 1332**
Fang Cai[1], Xinmiao Zhang[1], David Declercq[2], Bane Vasic[3], Dung Viet Nguyen[3], Shiva Planjery[3]
[1]Case Western Reserve University, United States; [2]ETIS Laboratory, France; [3]University of Arizona, United States

B4L-A.2 **Memory Efficient Ems Decoding for Non-Binary LDPC Codes 1336**
Leixin Zhou[3], Jin Sha[3], Yun Chen[2], Zhongfeng Wang[1]
[1]Broadcom Corporation, United States; [2]Fudan University, China; [3]Nanjing University, China

B4L-A.3 **Parallel Interleaver Architecture with New Scheduling Scheme for High Throughput Configurable Turbo Decoder 1340**
Guohui Wang[2], Aida Vosoughi[2], Hao Shen[2], Joseph R. Cavallaro[2], Yuanbin Guo[1]
[1]Futurewei Technologies, United States; [2]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 Cambareri[3], Javier Haboba[3], Fabio Pareschi[2], Riccardo Rovatti[3], Gianluca Setti[2], Kwok-Wo Wong[1]
[1]City University of Hong Kong, Hong Kong; [2]Università degli Studi di Ferrara, Italy; [3]Università di Bologna, Italy

B4L-B.3 **A Rakeness-Based Design Flow for Analog-to-Information Conversion by Compressive Sensing.....1360**
Valerio Cambareri[2], Mauro Mangia[2], Fabio Pareschi[1], Riccardo Rovatti[2], Gianluca Setti[1]
[1]Università degli Studi di Ferrara, Italy; [2]Università di Bologna, Italy

B4L-B.4 **Gating and Robust EKF Based Target Tracking in Mixed LOS/NLOS Environments 1364**
Lili Yi[2], Sirajudeen Gulam Razul[2], Zhiping Lin[2], Chong Meng See[1]
[1]DSO National Laboratories, Singapore; [2]Nanyang Technological University, Singapore

B4L-B.5 **Compressive Sensing Recovery from Non-Ideally Quantized Measurements.....1368**
Hsuan-Tsung Wang[2], Suvradip Ghosh[2], Walter Leon-Salas[1]
[1]Purdue University, United States; [2]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[1], Marco Mattavelli[1], Jorn Janneck[2]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]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*

B4L-D.1 **A 7 mW 2.5 GHz Spread Spectrum Clock Generator Using Switch-Controlled Injection-Locked Oscillator 1392**
Jeongmin Yang, Young-Ju Kim, Lee-Sup Kim
Korea Advanced Institute of Science and Technology, Korea, South

B4L-D.2 **A 40Gb/s 860μW Single-Phase 4:1 Multiplexer in 45nm CMOS 1396**
Elkim Roa, Byunghoo Jung
Purdue University, United States

B4L-D.3 **A Self-Calibrating Multi-VCO PLL Scheme with Leakage and Capacitive Modulation Mitigations 1400**
Yikui Jen Dong, Freeman Zhong
LSI Corporation, United States

B4L-D.4 **A 52 dBc MTPR Line Driver for Powerline Communication HomePlug AV Standard in 0.18-μm CMOS Technology 1404**
Pang-Kai Liu, Szu-Yao Hung, Chang-Yi Liu, Min-Han Hsieh, Charlie Chung-Ping Chen
National Taiwan University, Taiwan

B4L-D.5 **SSC Tracking Analysis and a Deeper-SSC Estimator 1408**
Yaming Zhang, Weixin Gai
Peking University, China

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[1], Nuno Rodrigues[2], Eduardo da Silva[3], Murilo de Carvalho[4], Sérgio de Faria[1]
[1]Instituto de Telecomunicações, Portugal; [2]Instituto Politécnico Leiria, Portugal; [3]Universidade Federal do Rio de Janeiro, Brazil; [4]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[1], Oscar C. Au[1], Wenxiu Sun[1], Lu Fang[2], Ketan Tang[1], Jiali Li[1], Yuanfang Guo[1]
[1]Hong Kong University of Science and Technology, Hong Kong; [2]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[1], Shi-Huang Chen[2], Bo-Wei Chen[1], Chih-Hsiang Peng[1], Jhing-Fa Wang[1]
[1]National Cheng Kung university, Taiwan; [2]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[2], Shuo Li[2], Muhamamd Adeel Tajammul[2], Muhammad Ali Shami[2], Guo Chen[2], Ahmed Hemani[2], Wei Ye[1]
[1]Huawei Technologies, China; [2]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[3], Lorenzo Ciampolini[4], Olivier Thomas[1], Bertrand Pelloux-Prayer[4], Shishir Kumar[5], Philipe Flatresse[4], Christophe Lecocq[4], Gérard Ghibaudo[2]
[1]CEA LETI, France; [2]IMEP-LAHC Minatec, France; [3]STMicroelectronics, France; [4]STMicroelectronics CCDS Crolles, France; [5]STMicroelectronics CCDS Noida, India

B4L-G.2 **An Improved Read/Write Scheme for Anchorless NEMS-CMOS Non-Volatile Memory 1456**
Anh Tuan Do[2], Karthik Gopal Jayaraman[2], Vincent Pott[1], Geng L. Chua[1], Pushpapraj Singh[1], Kiat Seng Yeo[2], Tony Tae Hyoung Kim[2]
[1]Agency for Science, Technology and Research, Singapore; [2]Nanyang Technological University, Singapore

B4L-G.3 **CMOS SRAM Scaling Limits Under Optimum Stability Constraints 1460**
Adam Makosiej[2], Olivier Thomas[1], Amara Amara[2], Andrei Vladimirescu[3]
[1]CEA LETI, France; [2]Institut Supérieur d'Electronique de Paris, France; [3]Institut Supérieur d'Electronique de Paris and University of California, Berkeley, France

B4L-G.4 **0.18 µm 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[2], Hao-I Yang[2], Wei-Nan Liao[2], Yi-Wei Lin[2], Nan-Chun Lien[2], Chien-Hen Chen[2], Ching-Te Chuang[2], Wei Hwang[2], Shyh-Jye Jou[2], Ming-Hsien Tu[1], Huan-Shun Huang[1], Yong-Jyun Hu[1], Paul-Sen Kan[1], Cheng-Yo Cheng[1], Wei-Chang Wang[1], Jian-Hao Wang[1], Kuen-Di Lee[1], Chia-Cheng Chen[1], Wei-Chiang Shih[1]
[1]Faraday Technology Corporation, Taiwan; [2]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[2], Hoi Lee[2], Xiwen Zhang[1]
[1]Texas Instruments, United States; [2]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 Saberkari[2], Rasoul Fathipour[2], Herminio Martínez[1], Alberto Poveda[1], Eduard Alarcón[1]
[1]Universitat Politècnica de Catalunya, Spain; [2]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[1], Yvon Savaria[1], Yves Blaquière[2]
[1]École Polytechnique de Montréal, Canada; [2]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 0.3mm² 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: Gianlucca Setti, *Universita' di Bologna*
Xiao Liu, *Brunel University*

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[2], Yuanming Suo[2], Srinjoy Mitra[1], Sang Peter Chin[2], Trac Tran[2], Refet Firat Yazicioglu[1], Ralph Etienne-Cummings[2]
[1]IMEC, Belgium; [2]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[3], Tian-Qi Zhao[3], Hsiao-Dong Chiang[2], Yong Tang[1], Yi Wang[1]
[1]China Electric Power Research Institute, China; [2]Cornell University, United States; [3]Tianjin University, China

B4L-L.2 **Homotopy-Enhanced Power Flow Methods for General Distribution Networks with Distributed Generators 1536**
Tian-Qi Zhao[1], Jiao-Jiao Deng[1], Kaoru Koyanagi[2]
[1]Tianjin University, China; [2]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[2], Warut Suampun[1], Hsiao-Dong Chiang[1]
[1]Cornell University, United States; [2]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.*

B5P-N.1 **Optimized Algorithms for Binary BCH Codes 1552**
Min Yin[1], Menwang Xie[2], Bo Yi[2]
[1]IBM GCG Systems & Technology Lab, China; [2]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[1], Hossam A. H. Fahmy[1], Yasmine A. H. Fahmy[1], Maha Elsabrouty[2]
[1]Cairo University, Egypt; [2]Egypt-Japan University of Science and Technology, Egypt

B5P-N.3 **Low-Power Design of Reed-Solomon Encoders 1560**
Wei Zhang[2], Jing Wang[2], Xinmiao Zhang[1]
[1]Case Western Reserve University, United States; [2]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[2], Gregory Cohen[2], Tara Hamilton[1], Jonathan Tapson[2], André van Schaik[2]
[1]University of New South Wales, Australia; [2]University of Western Sydney, Australia

B5P-Q.2 **Stochastic Resonance in an Analog Current-Mode Neuromorphic Circuit 1596**
Damien Querlioz, Vincent Trauchessec
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[1], Thomas Jacob Koickal[2], Athul Sripad Tiruvendipura[1], Luiz Carlos Gouveia[2], Alister Hamilton[2], Jordi Madrenas[1]
[1]Universitat Politècnica de Catalunya, Spain; [2]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[1], Junyong Si[2], Joern Ostermann[1], Weiping Li[2]
[1]Leibniz Universitaet Hannover, Germany; [2]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[1], Anhong Wang[2], Kongfen Zhu[2], Chunyu Lin[1], Yao Zhao[1]
[1]Beijing Jiaotong University, China; [2]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[2], Zhenyu Liu[1], Takeshi Ikenaga[2]
[1]Tsinghua University, China; [2]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[1], Zhiyi Yu[2], Xiaoyang Zeng[2], Liyang Zhou[3]
[1]Fudan Univerisity, China; [2]Fudan University, China; [3]Spreadtrum Company, China

B5P-T.2 **Implementation and Optimization of 3780-Point FFT on Multi-Core System.....1656**
Ming'E Jing[2], Zhiyi Yu[3], Xiaoyang Zeng[3], Jiayi Sheng[1], Haofan Yang[4]
[1]Boston University, United States; [2]Fudan Univerisity, China; [3]Fudan University, China; [4]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[1], Antonio Carlos Beck[2], Luigi Carro[2]
[1]Universidade Federal de Santa Maria, Brazil; [2]Universidade Federal do Rio Grande do Sul, Brazil

B5P-T.5 **High-Performance Multiplierless Transform Architecture for HEVC.....1668**
Wenjun Zhao[1], Takao Onoye[1], Tian Song[2]
[1]Osaka University, Japan; [2]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[3], Alaa El-Rouby[3], Hani Ragai[1], Yehea Ismail[2]
[1]Ain Shams University, Egypt; [2]American University in Cairo, Egypt; [3]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[3], Emmanuel Boutillon[3], Chris Winstead[4], Christophe Jégo[1], Michel Jézéquel[2]
[1]Institut Polytechnique Bordeaux, France; [2]Institut TELECOM/TELECOM Bretagne, France; [3]Université de Bretagne Sud, France; [4]Utah State University, United States

B5P-U.4 **Design and Verification of an All-Digital on-Chip Process Variation Sensor 1684**
Reum Oh[2], Jiwoong Jang[1], Man Young Sung[1]
[1]Korea University, Korea, South; [2]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[1], Hao Chen[1], Herbert Ho-Ching Iu[2]
[1]China University of Mining and Technology, China; [2]University of Western Australia, Australia

B6P-N.3 **New Implementation of Time Domain Measurement of Quality Factor 1700**
Ming Zhang[2], Nicolas Llaser[2], Xusheng Wang[2], Francis Rodes[1], Romain Deniéport[1]
[1]ENSEIRB, France; [2]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[2], Mino Pierri[2], Stefano D'Amico[2], Marcello De Matteis[1], Andrea Baschirotto[1], Alessandro Bau[1], A Passerini[1], Massimo Gervasi[1], Mario Zannoni[1]
[1]Università degli Studi di Milano - Bicocca, Italy; [2]Università del Salento, Italy

B6P-P: Phyiscal 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[2], Jing Wang[2], Zhangcai Huang[2], Atsushi Kurokawa[1], Yasuaki Inoue[2]
[1]Hirosaki University, Japan; [2]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[3], Song Chen[1], Wei Zhong[2], Takeshi Yoshimura[2]
[1]University of Science and Technology of China, China; [2]Waseda University, Japan; [3]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[2], Song Chen[1], Yuhuan Sun[2], Takeshi Yoshimura[2]
[1]University of Science and Technology of China, China; [2]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 47μW 204MHz AlN 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[1], Glenn Cowan[1], Mohamad Sawan[2]
[1]Concordia University, Canada; [2]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[2], Esteban Tlelo-Cuautle[2], Rodolfo Trejo-Guerra[3], Jesus Manuel Muñoz-Pacheco[1]
[1]Benemérita Universidad Autónoma de Puebla, Mexico; [2]INAOE, Mexico; [3]SEMTECH/Snowbush, Mexico

B6P-S.3 **On Oscillatory Dynamics of Small-RNAs-Mediated Two-Gene Regulatory Networks 1777**
Min Xiao[1], Wei Xing Zheng[2]
[1]Nanjing Xiaozhuang University, China; [2]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[2], Carlyle Câmara S. Jr. }, Fernando Rangel de Sousa[2], Robson Nunes de Lima[1]
[1]Universidade Federal da Bahia, Brazil; [2]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[2], Yansheng Li[2], Li Lijian Zhou[2], Masahiko Toyonaga[1]
[1]Kochi University, Japan; [2]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[1], Leibo Liu[1], Shouyi Yin[1], Qinghua Wu[1], Shaojun Wei[1], Jie Han[2]
[1]Tsinghua University, China; [2]University of Alberta, Canada

B6P-T.3 **A Fast Cam-Based Image Matching System on FPGA 1797**
Duc-Hung Le[2], Tran-Bao-Thuong Cao[3], Katsumi Inoue[1], Cong-Kha Pham[2]
[1]Advanced Original Technologies, Japan; [2]University of Electro-Communications Tokyo, Japan; [3]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[2], Farid Boussaid[2], Abbes Amira[1]
[1]Qatar University, Qatar; [2]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*

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[1], Hans Hegt[1], Sotir Ouzounov[2]
[1]Eindhoven University of Technology, Netherlands; [2]Philips Research, Netherlands

B6P-U.3 **An Ultra-Low-Power Voltage-Mode Asynchronous WTA-LTA Circuit 1817**
Jorge Fernández-Berni, Ricardo Carmona-Galán, Ángel Rodríquez-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[2], M. Jamal Deen[1]
[1]McMaster University, Canada; [2]University of Toronto, Canada

B7P-N.2 **A 0.3mm² 10-b 100MS/s Pipelined ADC Using Nauta Structure Op-Amps in 180nm CMOS 1833**
Andrew Nicholson[2], Julian Jenkins[1], Astria Nur Irfansyah[2], Nonie Politi[2], André van Schaik[3], Tara Hamilton[2], Torsten Lehmann[2]
[1]Perceptia Devices Inc., Australia; [2]University of New South Wales, Australia; [3]University of Western Sydney, Australia

B7P-N.4 **A Switched-Capacitor Biquad Using a Simple Quasi-Unity Gain Amplifier.....1841**
Hugo Serra[1], Nuno Paulino[1], Joao Goes[2]
[1]UNINOVA/CTS - Universidade Nova de Lisboa, Portugal; [2]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[1], Zheng Song[1], Baoyong Chi[1], Albert Wang[2], Tianling Ren[1], Zhihua Wang[1]
[1]Tsinghua University, China; [2]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[2], Chirn Chye Boon[2], Ayobami Iji[1], Yichuang Sun[3], Michael Heimlich[1]
[1]Macquarie University, Australia; [2]Nanyang Technological University, Singapore; [3]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 Gruosso, 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*

B7P-Q.1 **A Reconfigurable Architecture for Real-Time Prediction of Neural Activity 1869**
Will Li[1], Ray Cheung[1], Rosa Chan[1], Dong Song[2], Theodore Berger[2]
[1]City University of Hong Kong, Hong Kong; [2]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, Hyoungho 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[1], Andreas Demosthenous[2], Dai Jiang[2], Nick Donaldson[2]
[1]Brunel University, United Kingdom; [2]University College London, United Kingdom

B7P-Q.5 **A Flexible Biphasic Pulse Generating and Accurate Charge Balancing Stimulator with a 1μW 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 Vílchez-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[1], Mahua Raha Patra[1], Hafizur Rahaman[1], Parthasarathi Dasgupta[2]
[1]Bengal Engineering and Science University, India; [2]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*

B7P-S.1 **A Remotely Powered Multi Frequency RFID Sensing Tag with Integrated Impedance Measurement Interface 1910**
Martin Wiessflecker[2], Günter Hofer[2], Hannes Reinisch[2], Stefan Gruber[2], Gerald Holweg[2], Walther Pachler[1], Michael Klamminger[1], Wolfgang Pribyl[1]
[1]Graz University of Technology, Austria; [2]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 µW 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 Rooijakkers, 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*

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[2], Norm Filiol[1], Shaul Peker[2], Fei Yuan[2]
[1]Kaben Wireless Silicon Inc., Canada; [2]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[1], Hakan Kuntman[2], Bekir Sýddýk Yarman[3]
[1]Isik University, Istanbul Technical University, Turkey; [2]Istanbul Technical University, Turkey; [3]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*

B7P-U.1 **A 100Gb/s Quad-Rate Transformer-Coupled Injection-Locking CDR Circuit in 65nm CMOS 1950**
Fan-Ta Chen[1], Jen-Ming Wu[1], Yi-Chun Liu[1], Mau-Chung Chang[2]
[1]National Tsing Hua University, Taiwan; [2]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 0.13µm 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^m) 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*

B8P-N.1 **Experimental Results on Wideband Spectrum Sensing Using Random Sampling ADC in 90nm CMOS 1970**
Robert D'Angelo[2], Michael Trakimas[1], Shuchin Aeron[2], Sameer Sonkusale[2]
[1]International Rectifier, United States; [2]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[2], Peng Liu[2], Qiaoyan Yu[1]
[1]University of New Hampshire, United States; [2]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*

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[2], Edoardo Bonizzoni[2], Amit Patra[1], Franco Maloberti[2]
[1]Indian Institute of Technology Kharagpur, India; [2]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[1], Chia-Ming Kuo[1], Bin-Da Liu[1], Chun-Yueh Huang[2], Soon-Jyh Chang[1]
[1]National Cheng Kung University, Taiwan; [2]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*

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[3], Haipeng Fu[2], Mei Yan[2], Ahmet Tekin[1], Hao Yu[2], Suat Ay[3]
[1]Broadcom Corporation, United States; [2]Nanyang Technological University, Singapore; [3]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*

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*

B8P-S.1 **A Novel FIR Filter Based on Stochastic Logic 2050**
Jienan Chen, Jianhao Hu
University of Electronic Science and Technology of China, China

B8P-S.2 **Partial LUT Size Analysis in Distributed Arithmetic FIR Filters on FPGAs..... 2054**
Martin Kumm, Konrad Möller, Peter Zipf
University of Kassel, Germany

B8P-S.3 **Reconfigurable FIR Filter Using Distributed Arithmetic on FPGAs..... 2058**
Martin Kumm, Konrad Möller, Peter Zipf
University of Kassel, Germany

B8P-S.4 **A VLSI DBSCAN Processor Composed as an Array of Micro Agents Having Self-Growing Interconnects 2062**
Atsushi Shimada, Hongbo Zhu, Tadashi Shibata
University of Tokyo, Japan

B8P-S.5 **A Reconfigurable FFT Architecture for Variable-Length and Multi-Streaming OFDM Standards 2066**
Padma Prasad Boopal, Mario Garrido, Oscar Gustafsson
Linköping University, Sweden

B8P-S.6 **Hardware-fault attack handling in RNS-based Montgomery Multipliers 3042**
Dimitrios Schinianakis, Thanos Stouraitis
University of Patras, Greece

B8P-T: **Nano devices and Circuit applications**
Time: Tuesday, May 21, 2013, 16:20 - 17:50
Room: Poster Area
Chair: Sorin Cotofana, *Delft University*

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[2], Saket Srivastava[1], Liang Lu[2], Maire O'Neill[2], Earl Swartzlander Jr.
}
[1]Indraprastha Institute of Information Technology, India; [2]Queen's University Belfast, United Kingdom; [3]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[1], Pierre-Emmanuel Gaillardon[1], Ciprian Seiculescu[1], Vasilis F. Pavlidis[2], Giovanni De Micheli[1]
[1]École Polytechnique Fédérale de Lausanne, Switzerland; [2]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[2], Xinghuo Yu[1]
[1]RMIT University, Australia; [2]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[1], Wei Xing Zheng[2]
[1]Huazhong University of Science and Technology, China; [2]University of Western Sydney, Australia

C1L-A.4 **Hybrid Modelling of the General Middle-Sized Genetic Regulatory Networks 2103**
Pei Wang[3], Renquan Lu[2], Yao Chen[1], Xiaoqun Wu[4]
[1]Beijing Jiaotong University, China; [2]Hangzhou Dianzi University, China; [3]Henan University, China; [4]Wuhan University, China

C1L-A.5 **Multi-Layer Perceptron Including Glial Pulse and Switching Between Learning and Non-Learning 2107**
Chihiro Ikuta[1], Yoko Uwate[1], Yoshifumi Nishio[1], Guoan Yang[2]
[1]Tokushima University, Japan; [2]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[1], Fabien Clermidy[1], Luca Amarù[2], Pierre-Emmanuel Gaillardon[2], Giovanni De Micheli[2]
[1]CEA LETI, France; [2]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*

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*

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[1], Bei Yin[1], Aida Vosoughi[1], Christoph Studer[1], Joseph R. Cavallaro[1], Chris Dick[2]
[1]Rice University, United States; [2]Xilinx, United States

C1L-D.3 **Multidimensional Householder Based High-Speed QR Decomposition Architecture for MIMO Receivers 2159**
Iput 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[2], Shang-Ho Tsai[2], Ruei-Ching Chang[2], Yan-Cheng Chen[2], Gene C.-H. Chuang[1]
[1]Information and Communications Research Laboratories, Industrial Technology Research Institute, Taiwan; [2]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*

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 ..... N/A**
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*

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[2], John Liobe[1], Zeljko Ignjatovic[2], Mark Bocko[2]
[1]ADVIS Inc., United States; [2]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*

C1L-G.1 **A Signed Integer Programmable Power-of-Two Scaler for ^{2}n-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*

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*

C1L-J.1 **Digitally Controlled Wide Range Pulse Width Modulator for on-Chip Power Supplies 2251**
Selcuk Köse[2], Inna Vaisband[1], Eby Friedman[1]
[1]University of Rochester, United States; [2]University of South Florida, United States

C1L-J.2 **How to Reach 100% Coding Efficiency in Multilevel Burst-Mode RF Transmitters 2255**
Katharina Hausmair[1], Shuli Chi[1], Christian Vogel[2]
[1]Graz University of Technology, Austria; [2]Telecommunications Research Center Vienna, Austria

C1L-J.3 **Accurate Time Domain Extraction of Supercapacitor Fractional-Order Model Parameters 2259**
Todd Freeborn[1], Brent Maundy[1], Ahmed Elwakil[2]
[1]University of Calgary, Canada; [2]University of Sharjah, U.A.E.

C1L-J.4 **Coding Efficiency of Bandlimited PWM Based Burst-Mode RF Transmitters 2263**
Shuli Chi[1], Katharina Hausmair[1], Christian Vogel[2]
[1]Graz University of Technology, Austria; [2]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*

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[2], Zedong Nie[2], Kamen Ivanov[2], Lei Wang[2], Ran Liu[1]
[1]Blekinge Institute of Technology, Sweden; [2]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[2], Jianfeng Wang[1], Tianjia Sun[2], Xiang Xie[2], Guolin Li[2], Yingke Gu[2], Zhihua Wang[2]
[1]Beijing University of Posts and Telecommunications, China; [2]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: Jinhu Lu, *Chinese Academy of Sciences*
Guanrong Chen, *University of Hong Kong*
Ljiljana Trajkovic, *Simon Fraser University*

C1L-L.1 **Theory and Applications of Complex Networks: Advances and Challenges 2291**
Jinhu Lü[1], Guanrong Chen[2], Maciej J. Ogorzalek[3], Ljiljana Trajkovic[4]
[1]Chinese Academy of Sciences, China; [2]City University of Hong Kong, China; [3]Jagiellonian University, Poland; [4]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[2], Ming Cao[2], Chai Wah Wu[1]
[1]IBM T. J. Waston Research Center, United States; [2]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: Jinhu Lu, *Chinese Academy of Sciences*

C2L-A.1 **Towards Reliable Hybrid Bio-Silicon Integration Using Novel Adaptive Control System 2311**
Jun Wen Luo[2], Patrick Degenaar[2], Graeme Coapes[2], Alex Yakovlev[2], Terrence Mak[1], Peter Andras[2]
[1]Chinese University of Hong Kong, China; [2]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[1], Wei Xing Zheng[2]
[1]Nanjing Xiaozhuang University, China; [2]University of Western Sydney, Australia

C2L-A.4 **A Model Based Comparison of BiFeO3 Device Applicability in Neuromorphic Hardware 2323**
Love Cederström[3], Paul Stärke[2], Christian Mayr[2], Yao Shuai[1], Heidemarie Schmidt[1], Rene Schüffny[2]
[1]Helmholtz-Zentrum Dresden-Rossendorf, Germany; [2]Technische Universität Dresden, Germany; [3]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[2], Mitchell Spryn[2], Bruce Kim[2], Eugene Edwards[1], Christina Brantley[1], Paul Ruffin[1]
[1]U.S. Army, RDECOM/AMRDEC, United States; [2]University of Alabama, United States

C2L-B.3 **SRAM Device and Cell Co-Design Considerations in a 14nm SOI FinFET Technology 2339**
Binjie Cheng[3], Xingsheng Wang[3], Andrew R. Brown[1], Jente B. Kuang[2], David Reid[1], Campbell Millar[1], Sani Nassif[2], Asen Asenov[3]
[1]Gold Standard Simulations Ltd, United Kingdom; [2]IBM, United States; [3]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*

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[1], Chong Min Kyung[1], Khawaja Muhammad Yahya[2]
[1]Korea Advanced Institute of Science and Technology, Korea, South; [2]University of Engineering and Technology, Peshawar, Pakistan

C2L-C.4 **Depth Map Enhancement Based on Z-Displacement of Objects 2361**
Gwo Giun Lee[2], Ciao-Siang Siao[2], Chunhui Cui[1], Chun-Fu Chen[2], Yan Huo[1], Huan-Hsiang Lin[2]
[1]Hong Kong Applied Science and Technology Research Institute, Hong Kong; [2]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[1], Karim Allidina[1], Frederic Nabki[2], Mourad El-Gamal[1]
[1]McGill University, Canada; [2]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*

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[2], Jenq-Neng Hwang[2], Jen-Yu Yu[1], Kual-Zheng Lee[1]
[1]Information & Communication Research Lab, ITRI, Taiwan; [2]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[2], Jenq-Neng Hwang[2], Kresimir Williams[1], Richard Towler[1]
[1]National Oceanic and Atmospheric Association, United States; [2]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*

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 120µW 240×110@25fps Vision Chip with ROI Detection SIMD Processing Unit 2412**
Arnaud Verdant[1], Antoine Dupret[1], Patrick Villard[1], Laurent Alacoque[1], Herve Mathias[2], Flavien Delgehier[2]
[1]CEA LETI, France; [2]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[1], Jongkil Park[4], Alejandro Linares-Barranco[2], A. Jiménez[2], Ryad Benosman[3], Bernabe Linares-Barranco[1]
[1]CSIC - Instituto de Microelectrónica de Sevilla IMSE-CNM, Spain; [2]Universidad de Sevilla, Spain; [3]Université Pierre-et-Marie-Curie, France; [4]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*

C2L-G.1 **Preprocessing Technique for Accelerating Reconfiguration of Degradable VLSI Arrays 2424**
Yuanbo Zhu[2], Jigang Wu[2], Seiw Kei Lam[1], Thambipillai Srikanthan[1]
[1]Nanyang Technological University, Singapore; [2]Tianjin Polytechnic University, China

C2L-G.2 **FPGA Based Single Cycle, Reconfigurable Router for NoC Applications 2428**
Priyank Gupta[1], Ali Akoglu[2], Kathleen Melde[2], Janet Roveda[2]
[1]Cirrus Logic, Inc, United States; [2]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[1], Ogun Turkyilmaz[1], Marina Reyboz[1], Fabien Clermidy[1], Elisa Vianello[1], Jean-Michel Portal[2], Christophe Muller[2]
[1]CEA LETI, France; [2]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*

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[1], Jorge Fernandes[1], Fabio Rabuske[3], Cesar Rodrigues[3], Marcelino Dos Santos[2]
[1]INESC-ID - Universidade Técnica de Lisboa, Portugal; [2]INESC-ID - Universidade Técnica de Lisboa / SiliconGate Ltda., Portugal; [3]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*

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[1], Shouri Chatterjee[2], Kaushik Saha[3], Taranjit Kukal[1]
[1]Cadence Design Systems, India; [2]Indian Institute of Technology Delhi, India; [3]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: Gianlucca Setti, *Universita' di Bologna*
Herming Chiueh, *National Chiao Tung University*

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*

C2L-L.1 **Recent Advances in Bridging Time Series and Complex Networks.....2505**
Xiang Li[1], Xin Liu[1], Chi K. Tse[2]
[1]Fudan University, China; [2]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*

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[1], Henry Leung[2]
[1]Chongqing University of Posts and Telecommunications, China; [2]University of Calgary, Canada

C3L-A.3 **A Node-Weight Equalization Problem with Circuit-Based Computations 2525**
Yoichi Sakai[1], Kiyoshi Nakayama[2], Norihiko Shinomiya[1]
[1]Soka University, Japan; [2]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[1], Xiang Li[1], Lin Han[2]
[1]Fudan University, China; [2]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*

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[1], Chun-Yao Wang[1], Ching-Yi Huang[1], Yung-Chih Chen[2]
[1]National Tsing Hua University, Taiwan; [2]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*

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[1], Ngai Wong[1], Ka Lok Man[2]
[1]University of Hong Kong, Hong Kong; [2]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*

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^m) 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[1], Soo-Chang Pei[2]
[1]Chung Yuan Christian University, Taiwan; [2]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[2], M. Omair Ahmad[1], M. N. S. Swamy[1]
[1]Concordia University, Canada; [2]University Setif 1, Algeria

C3L-E.4 **Closed-Form Design of Fractional Order Differentiator Using Discrete Cosine Transform.....2609**
Chien-Cheng Tseng[2], Su-Ling Lee[1]
[1]Chang Jung Christian University, Taiwan; [2]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[3], Xu Wang[1], Rendong Ying[2], Bo Hu[1]
[1]Fudan University, China; [2]Shanghai Jiao Tong University, China; [3]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 8×8 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[2], Walter Leon-Salas[1]
[1]Purdue University, United States; [2]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** ..... N/A
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[2], Qin Wang[2], Jing Xie[2], Jin Tian[2], Jianfei Jiang[2], Yufei Li[1], Wen Yin[1]
[1]IBM China System Technology Lab, China Design Center, China; [2]Shanghai Jiao Tong University, China

C3L-G.4 **Current Profile of a Microcontroller to Determine Electromagnetic Emissions** 2650
Selcuk Köse[3], Eby Friedman[2], Radu Secareanu[1], Olin Hartin[1]
[1]Freescale Semiconductor, United States; [2]University of Rochester, United States; [3]University of South Florida, United States

C3L-G.5 **Synthesis of 3D Clock Tree with Pre-Bond Testability** 2654
Sying-Jyan Wang[1], Cheng-Hao Lin[1], Katherine Shu-Min Li[2]
[1]National Chung Hsing University, Taiwan; [2]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[2], Ramy Iskander[2], Marie-Minerve Louërat[2], François Durbin[1]
[1]CEA DAM, France; [2]Université Pierre et Marie Curie / LIP6, France

C3L-H.3 **Channel Characterization Using Jitter Measurements 2666**
Dustin Dunwell[2], Atul Gupta[1], Anthony Chan Carusone[2]
[1]Mindspeed Technologies Inc., United States; [2]University of Toronto, Canada

C3L-H.4 **Electronically Programmable Test Points for on-Chip Analog/Digital Measurements 2670**
Murillo Franco[1], Jairo Güiza[1], Erasmo Chiappetta[1], Sergio Rueda[1], Hamilton Luis[1], José Bertuzzo[1], James Koeppe[2], Tim Robins[2], Julian Jenkins[2], Tara Hamilton[3]
[1]Instituto de Pesquisas Eldorado, Brazil; [2]Perceptia Devices Inc., Australia; [3]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[1], Mounir Meghelli[2], Daniel Friedman[2]
[1]Concordia University, Canada; [2]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[2], Federico Bizzarri[1], Angelo Maurizio Brambilla[1], Marco Storace[2]
[1]Politecnico di Milano, Italy; [2]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[2], Agustin Ochoa[1]
[1]Rockwell Se. Systems, United States; [2]University of Alberta, Canada

C3L-K.3 **Improving the Power Efficiency of 60 GHz Phase Arrays by Eliminating the Array-Induced Inter-Symbol Interference ..... N/A**
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[2], Khaled Nabil Salama[2], Pakhung Ho[1]
[1]ASM Pacific Technology Hong Kong Limited, Hong Kong; [2]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[1], Elena Blokhina[2]
[1]Université Pierre et Marie Curie / LIP6, France; [2]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[2], Miquel López-Suárez[3], Eduard Alarcón[4], Riccardo Rurali[1], Gabriel Abadal[3]
[1]Institut de Ciencia de Materials de Barcelona, Spain; [2]Univeristat Rovira i Virgili, Spain; [3]Universitat Autònoma de Barcelona, Spain; [4]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[3], Daniele Fournier-Prunaret[1], Peter Harte[3], Dimitri Galayko[2], Orla Feely[3]
[1]LAAS-CNRS, INSA, Toulouse, France; [2]Université Pierre et Marie Curie / LIP6, France; [3]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[2], Herbert Ho-Ching Iu[2], Bharathwaj Muthuswamy[1]
[1]Milwaukee School of Engineering, United States; [2]University of Western Australia, Australia

C4L-A.3 **Spurious Tones in Digital Delta Sigma Modulators with Pseudorandom Dither 2747**
Michael Peter Kennedy[2], Brian Fitzgibbon[1], Kerry Dobmeier[3]
[1]Susquehanna International Group, Ireland; [2]University College Cork, Ireland; [3]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[1], Warwick Tucker[2]
[1]AGH University of Science and Technology, Poland; [2]Uppsala University, Sweden

C4L-A.5 **Dynamical Analysis of Single-Inductor Dual-Output DC-DC Converters 2755**
Kuntal Mandal[3], Abdullah Abusorrah[4], Mohammed M. Al- Hindawi[4], Yusuf Al-Turki[4], Damian Giaouris[1], Soumitro Banerjee[2]
[1]Centre for Research and Technology Hellas, Greece; [2]Indian Institute of Science Education & Research -Kolkata, India; [3]Indian Institute of Technology Kharagpur, India; [4]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*

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[1], Khurram Afridi[2], Gerald Sussman[2], Chris Terman[2], Jacob White[2], Lyla Fischer[1], Anant Agarwal[1]
[1]edX, United States; [2]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[2], Juan Edmundo Cousseau[3], Oscar Ernesto Agazzi[1], Mario Rafael Hueda[2]
[1]ClariPhy Communications, Inc, United States; [2]Laboratorio de Comunicaciones Digitales - Universidad Nacional de Córdoba, Argentina; [3]Universidad Nacional del Sur - Bahía Blanca, Argentina

C4L-C.5 **Delay Element Concept for Continuous Time Digital Signal Processing 2775**
Karsten Konrad[2], Dieter Brückmann[2], Nima Tavangaran[2], Jidan Al-Eryani[1], Rainer Kokozinski[1], Thomas Werthwein[2]
[1]Universität Duisburg-Essen, Germany; [2]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*

C4L-L.1 **On the Efficient Wireless Power Transfer in Resonant Multi-Receiver Systems 2779**
David Ricketts[2], Matthew Chabalko[1]
[1]Central Michigan University, United States; [2]North Carolina State University, United States

C4L-L.2 **Interference Analysis on Resonant Inductive Coupled Wireless Power Transfer Links 2783**
Elisenda Bou[2], Eduard Alarcon[2], Raymond Sedwick[3], Peter Fisher[1]
[1]Massachusetts Institute of Technology, United States; [2]Universitat Politècnica de Catalunya, Spain; [3]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[1], Il-Oun Lee[1], Sangcheol Moon[1], Gun-Woo Moon[1], Bong-Chul Kim[2], Ki Young Kim[2]
[1]Korea Advanced Institute of Science and Technology, Korea, South; [2]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*

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[1], Soo-Chang Pei[2]
[1]Academia Sinica, Taiwan; [2]National Taiwan University, Taiwan

C5P-N.4 **Fast and Improved Seam Carving with Strip Partition and Neighboring Probability Constraints.....2812**
Lifang Wu[1], Lianchao Cao[1], Changwen Chen[2]
[1]Beijing University of Technology, China; [2]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[1], Abdul Ghafoor[2], Muhammad Mohsin Riaz[2]
[1]Balochistan University of Information Technology, Engineering, Pakistan; [2]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[1], Yuan Shen[1], Aimin Jiang[2], Ning Xu[1], Changping Zhu[2]
[1]Changzhou Key Laboratory of Sensor Networks and Environmental Sensing, China; [2]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[2], Su-Ling Lee[1]
[1]Chang Jung Christian University, Taiwan; [2]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[1], Shaohui Liu[1], Ruiqin Xiong[2], Siwei Ma[2], Debin Zhao[1]
[1]Harbin Institute of Technology, China; [2]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*

C5P-Q.1 **Depth-Aided Exemplar-Based Hole Filling for DIBR View Synthesis 2840**
Xuyuan Xu[2], Lai-Man Po[2], Chun-Ho Cheung[2], Litong Feng[2], Ka-Ho Ng[2], Kwok-Wai Cheung[1]
[1]Chu Hai College of Higher Education, Hong Kong; [2]City University of Hong Kong, Hong Kong

C5P-Q.2 **Cross-Scene Abnormal Event Detection 2844**
Tzu-Yi Hung[2], Jiwen Lu[1], Yap-Peng Tan[2]
[1]Advanced Digital Sciences Center, Illinois at Singapore Pte. Ltd., Singapore; [2]Nanyang Technological University, Singapore

C5P-Q.3 **To Exploit Uncertainty Masking for Adaptive Image Rendering 2848**
Lu Dong[2], Weisi Lin[2], Chenwei Deng[1], Ce Zhu[2], Hock Soon Seah[2]
[1]Beijing Institute of Technology, China; [2]Nanyang Technological University, Singapore

C5P-Q.4 **A Fast Depth-Map Wedgelet Partitioning Scheme for Intra Prediction in 3D Video Coding 2852**
Mengmeng Zhang[3], Chuan Zhao[3], Jizheng Xu[2], Huihui Bai[1]
[1]Beijing Jiaotong University, China; [2]Microsoft Research Asia, China; [3]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*

C5P-R.1 **Fast Vehicle Detection Based on Feature and Real-Time Prediction.....2860**
Hanyang Xu[1], Zeng Zhou[2], Bin Sheng[1], Lizhuang Ma[1]
[1]Shanghai Jiao Tong University, China; [2]Suntec Software Shanghai Co., LTD, China

C5P-R.2 **Parallelizing Video Transcoding with Load Balancing on Cloud Computing.....2864**
Song Lin[2], Xinfeng Zhang[1], Qin Yu[2], Honggang Qi[3], Siwei Ma[2]
[1]Institute of Computing Technology, Chinese Academy of Sciences, China; [2]Peking University, China; [3]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[1], Siwei Ma[2], Debin Zhao[1], Wen Gao[2]
[1]Harbin Institute of Technology, China; [2]Peking University, China

C5P-S.2 **Recover Image Details from LDR Photographs 2884**
Kui Fan[1], Honggang Qi[3], Dawei Du[2], Changhua Zhang[2]
[1]Beijing Jiaotong University, China; [2]University of Electronic Science and Technology of China, China; [3]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[4], Weisi Lin[4], Zhenzhong Chen[3], Chia-Wen Lin[5], Zhijun Fang[2], Chenwei Deng[1]
[1]Beijing Institute of Technology, China; [2]Jiangxi University of Finance and Economics, China; [3]MediaTek USA Inc., United States; [4]Nanyang Technological University, Singapore; [5]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[2], Weiyao Lin[2], Xiaozhen Zheng[1], Xintong Han[2], Hang Chu[2], Xiaoyun Zhang[2]
[1]Huawei Technologies, China; [2]Shanghai Jiao Tong University, China

C5P-S.5 **SIFT-Based Image Super-Resolution 2896**
Huanjing Yue[3], Jingyu Yang[3], Xiaoyan Sun[2], Feng Wu[1]
[1]Microsoft Research Aisa, China; [2]Microsoft Research Asia, China; [3]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[2], Viet Anh Nguyen[1], Minh N. Do[3]
[1]Advanced Digital Sciences Center, Illinois at Singapore Pte. Ltd., Singapore; [2]Korea Advanced Institute of Science and Technology, Korea, South; [3]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[3], Yu-Feng Hsu[2], Rogerio Feris[1], Ming-Ting Sun[3]
[1]IBM T. J. Watson Research Center, United States; [2]Industrial Technology Research Institute, Taiwan; [3]University of Washington, United States

C5P-T.3 **Influence of Camera Imaging Pipeline on Stereo-Matching Quality: an Experimental Study.....2908**
Mihail Georgiev[2], Atanas Gotchev[2], Miska Hannuksela[1]
[1]Nokia Research Center, Finland; [2]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[1], Chin-Long Su[2]
[1]Feng-Chia University, Taiwan; [2]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 2920**
Wu-Sheng Lu[1], Takao Hinamoto[2]
[1] University of Victoria, Canada; [2] Hiroshima University, Japan

C6P-N.2 **Design and Application of Allpass Filters with Equiripple Group Delay Errors..... 2924**
Xiaoping Lai[1], Zhiping Lin[2]
[1]Hangzhou Dianzi University, China; [2]Nanyang Technological University, Singapore

C6P-N.3 **Tracking Properties of Complex Adaptive Notch Filter for Detection of Multiple Real Sinusoids..... 2928**
Shotaro Nishimura[2], Aloys Mvuma[3], Takao Hinamoto[1]
[1]Hiroshima University, Japan; [2]Shimane University, Japan; [3]University of Dodoma, Japan

C6P-N.4 **An Efficient Matrix Iterative Algorithm for the WLS Design of 2-D FIR Filters 2932**
Ruijie Zhao[2], Xiaoping Lai[1]
[1]Hangzhou Dianzi University, China; [2]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[1], Bo Zhang[2], Fan Xie[2], Herbert Ho-Ching Iu[3], Wei Hu[1]
[1]Guangzhou University, China; [2]South China University of Technology, China; [3]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[1], Yung-Sheng Huang[1], Andreas Ehrhart[2], Yu-Huei Lee[1], Chao-Chang Chiu[1], Bernhard Wicht[2], Ke-Horng Chen[1]
[1]National Chiao Tung University, Taiwan; [2]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[1], Na Rong[1], Ting Sun[1], Jing Zhang[2]
[1]Guizhou University, China; [2]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[2], Ruimin Hu[2], Zhongyuan Wang[2], Zixiang Xiong[1], Zhen Han[2]
[1]Texas A&M University, United States; [2]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 2μW Digital Baseband Core for Wireless Micro-Neural-Interface in 0.18μm CMOS 3008**
Ran Liao[1], Chriswell Hutchens[1], Robert Rennaker II[2]
[1]Oklahoma State University, United States; [2]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[2], Nitin Chandrachoodan[1]
[1]Indian Institute of Technology Madras, India; [2]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[1], Tong Lin[2], Weng-Geng Ho[2], Kwen-Siong Chong[2], Bah-Hwee Gwee[2], Joseph Chang[2]
[1]Agency for Science, Technology and Research, Singapore; [2]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[1], Bo Wang[1], Xiangyao Yu[2], Tony Tae Hyoung Kim[1]
[1]Nanyang Technological University, Singapore; [2]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[1], Nalesh S[1], Arka Maity[3], S K Nandy[1], Ranjani Narayan[2]
[1]Indian Institute of Science, Bangalore, India; [2]Morphing Machines Pvt.Ltd. Bangalore, India; [3]National Institute of Technology, Durgapur, India

C6P-T.5 **Balancing Adder for Error Tolerant Applications 3038**
Matthew Weber[1], Mateja Putic[1], Hang Zhang[1], John Lach[1], Jiawei Huang[2]
[1]University of Virginia, USA; [2]NVIDIA Corp. CA