2015 Design, Automation & Test in Europe Conference & Exhibition

(DATE 2015)

Grenoble, France
9-13 March 2015

Pages 1-841

IEEE Catalog Number: CFP15162-POD
ISBN: 978-1-4799-6404-8

Day 2: Tuesday, March 10, 2015

2.2	2.3	2.4	2.5	2.6	2.7	3.0	3.2	3.3	3.4	3.5	3.6	3.7	3.8	IP1	4.2	4.3	4.4	4.5	4.6	4.7

Day 3: Wednesday, March 11, 2015

5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	IP2	6.1	6.2	6.3	6.4	6.5	6.6	6.7	7.0	7.1	7.2	7.3
7.4	7.5	7.6	7.7	IP3	8.1	8.2	8.3	8.4	8.5	8.6	8.7								

Day 4: Thursday, March 12, 2015

9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	IP4	10.1	10.2	10.3	10.4	10.5	10.6	10.7	11.0	11.1	11.2
11.3	11.4	11.5	11.6	11.7	IP5	12.1	12.2	12.3	12.4	12.5	12.6	12.7						

Session Title	**Adaptability for Low Power Computing**
Session Code / Room	**2.2 / Belle Etoile**
Date & Time	**Tuesday, 10 March 2015, 11:30 – 13:00**
Chair	**Patrick Knocke**, *OFFIS, DE*
Co-Chair	**Ruzica Jevtic**, *Universidad Carlos III, ES*

2.2.1 11:30 - 12:00
Clock Domain Crossing Aware Sequential Clock Gating 1
Jianfng Liu, Mi-Suk Hong, Kyungtae Do, Jung Yun Choi, Jaehong Park, Mohit Kumar, Manish Kumar, Nikhil Tripathi and Abhishek Ranjan

2.2.2 12:00 - 12:30
An Energy Efficient Backup Scheme with Low Inrush Current for Nonvolatile SRAM in Energy Harvesting Sensor Nodes 7
Hehe Li, Yongpan Liu, Qinghang Zhao, Yizi Gu, Xiao Sheng, Guangyu Sun, Chao Zhang, Meng-Fan Chang, Rong Luo and Huazhong Yang

2.2.3 12:30 - 12:45
Race to Idle or Not: Balancing the Memory Sleep Time with DVS for Energy Minimization 13
Chenchen Fu, Minming Li and Chun Jason Xue

2.2.4 12:45 - 13:00
Event-Driven and Sensorless Photovoltaic System Reconfiguration for Electric Vehicles 19
Xue Lin, Yanzhi Wang, Massoud Pedram, Jaemin Kim and Naehyuck Chang

Session Title	**System Level Design Methods**
Session Code / Room	**2.3 / Stendhal**
Date & Time	**Tuesday, 10 March 2015, 11:30 – 13:00**
Chair	**Yuichi Nakamura**, *NEC, JP*
Co-Chair	**Andreas Herkersdorf**, *TU München, DE*

2.3.1 11:30 - 12:00
Online Binding of Applications to Multiple Clock Domains in Shared FPGA-based Systems 25
Farzad Samie, Lars Bauer, Chih-Ming Hsieh and Jörg Henkel

2.3.2 12:00 - 12:30
Profiling-Driven Multi-Cycling in FPGA High-Level Synthesis 31
Stefan Hadjis, Andrew Canis, Ryoya Sobue, Yuko Hara-Azumi, Hiroyuki Tomiyama and Jason Anderson

2.3.3 12:30 - 13:00
Schedulability Bound for Integrated Modular Avionics Partitions 37
Jung-Eun Kim, Tarek Abdelzaher and Lui Sha

Session Title	Automotive Systems and Smart Energy Systems
SessionCode/Room	2.4 / Chartreuse
Date & Time	Tuesday, 10 March 2015, 11:30 – 13:00
Chair	**Bart Vermeulen**, *NXP Semiconductors, NL*
Co-Chair	**Geoff Merrett**, *University of Southampton, UK*

Session Title	Power of Assertions
Session Code/Room	2.5 / Meije
Date & Time	Tuesday, 10 March 2015, 11:30 – 13:00
Chair	**Franco Fummi**, *University of Verona, IT*
Co-Chair	**Pablo Sanchez**, *University of Cantabria, ES*

Session Title	Design and Analysis of Dependable Systems
Session Code/Room	2.6 / Bayard
Date & Time	Tuesday, 10 March 2015, 11:30 – 13:00
Chair	**Arne Hamann**, *Robert Bosch GmbH, DE*
Co-Chair	**Viacheslav Izosimov**, *Semcon/KTH, SE*

2.6.4 12:45 - 13:00 **Detection of Illegitimate Access to JTAG via Statistical Learning in Chip** **109**
Xuanle Ren, Vitor Grade Tavares and R. D. (Shawn) Blanton

Session Title	**Compilation and Code Transformations for Reconfigurable Computing**
Session Code/Room	**2.7 / Les Bans**
Date & Time	**Tuesday, 10 March 2015, 11:30 – 13:00**
Chair	**Dirk Stroobandt**, *University of Ghent, BE*
Co-Chair	**Marco Platzner**, *University of Paderborn, DE*

2.7.1 11:30 - 12:00 **Joint Affine Transformation and Loop Pipelining for Mapping Nested Loop on CGRAs** **115**
Shouyi Yin, Dajiang Liu, Leibo Liu, Shaojun Wei and Yike Guo

2.7.2 12:00 - 12:30 **Path Selection Based Acceleration of Conditionals in CGRAs** **121**
ShriHari RajendranRadhika, Aviral Shrivastava and Mahdi Hamzeh

2.7.3 12:30 - 13:00 **Hardware-Assisted Code Obfuscation for FPGA Soft Microprocessors** **127**
Meha Kainth, Lekshmi Krishnan, Chaitra Narayana, Sandesh Gubbi Virupaksha and Russell Tessier

Session Title	**LUNCH TIME KEYNOTE SESSION: "How Micro-Electronic Will Change Your Life Style" Sponsored by Mentor Graphics**
Session Code/Room	**3.0 / Salle Oisans**
Date & Time	**Tuesday, 10 March 2015, 13:20 – 14:20**
Chair	**Jean-Marie Saint-Paul**, *Mentor Graphics, FR*
Co-Chair	

3.0.1 13:20 - 13:30 **New Life Styles Beyond Your Dreams** **N/A**
Thierry Collette

3.0.2 13:30 - 13:50 **Drones that Fly for You** **N/A**
Nicolas Besnard

3.0.3 13:50 - 14:10 **Robots that Live With You** **N/A**
Rodolphe Gelin

Session Title	**Passive Implementation Attacks and Countermeasures**
Session Code /Room	**3.2 / Belle Etoile**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**Francois-Xavier Standaert**, *UCL, BE*
Co-Chair	**Francesco Regazzoni**, *AlaRI, CH*

3.2.1 14:30 - 15:00 **Reliable Information Extraction for Single Trace Attacks** **133**
Valentina Banciu, Elisabeth Oswald and Carolyn Whitnall

3.2.2 15:00 - 15:30 **SCANDALee: A Side-ChANnel-based DisAssembLer using Local Electromagnetic Emanations** **139**
Daehyun Strobel, Florian Bache, David Oswald, Falk Schellenberg and Christof Paar

3.2.3 15:30 - 15:45 **Side-Channel Attacks from Static Power: When Should We Care?** **145**
Santos Merino Del Pozo, François-Xavier Standaert, Dina Kamel and Amir Moradi

3.2.4 15:45 - 16:00 **Extrax: Security Extension to Extract Cache Resident Information for Snoop-Based External Monitors** **151**
Jinyong Lee, Yongje Lee, Hyungon Moon, Ingoo Heo and Yunheung Paek

Session Title	**Loop Acceleration**
Session Code / Room	**3.3 / Stendhal**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**Jürgen Teich**, *FAU Erlangen, DE*
Co-Chair	**Benjamin Schafer**, *Hong Kong Polytechnic University, HK*

Session Title	**Tackling Memory Walls with Emerging Architectures and Technologies**
Session Code / Room	**3.4 / Chartreuse**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**Akash Kumar**, *NUS, SG*
Co-Chair	**Cristina Silvano**, *Politecnico di Milano, IT*

Session Title	**Breaking Simulation Boundaries**
Session Code / Room	**3.5 / Meije**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**Elena Ioana Vatajelu**, *Politecnico di Torino, IT*
Co-Chair	**Florian Letombe**, *Synopsys, FR*

3.5.4 **Source Level Performance Simulation of GPU Cores** **217**
15:45 - 16:00 *Christoph Gerum, Oliver Bringmann and Wolfgang Rosenstiel*

Session Title	**Hot Topic - Memristor based Computation-in-Memory Architecture for Data-Intensive Applications**
Session Code / Room	**3.6 / Bayard**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**(.) (.)**, *(.), (.)*
Co-Chair	**(.) (.)**, *(.), (.)*

3.6.1 **Data-Intensive Applications- A Major Challenge Ahead [1136]** **N/A**
14:30 - 15:00 *Jan van Lunteren*

3.6.2 **CIM Architecture- Beyond Von Neumann [1136]** **N/A**
15:00 - 15:30 *Koen Bertels and Henk Coorporal*

3.6.3 **Memristive Devices - The Key Enabler for CIM Architecture Implementation [1136]** **N/A**
15:30 - 16:00 *Eike Linn*

Session Title	**Model-based Analysis and Verification**
Session Code / Room	**3.7 / Les Bans**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**Saddek Bensalem**, *Université Joseph Fourier, FR*
Co-Chair	**Linh Thi Xuan Phan**, *University of Pennsylvania, US*

3.7.1 **Delay Analysis of Structural Real-Time Workload** **223**
14:30 - 15:00 *Nan Guan, Yue Tang, Yang Wang and Wang Yi*

3.7.2 **Effective Verification of Low-Level Software with Nested Interrupts** **229**
15:00 - 15:30 *Daniel Kroening, Lihao Liang, Tom Melham, Peter Schrammel and Michael Tautschnig*

3.7.3 **Platform-Specific Timing Verification Framework in Model-Based Implementation** **235**
15:30 - 15:45 *BaekGyu Kim, Lu Feng Linh T.X. Phan, Oleg Sokolsky and Insup Lee*

3.7.4 **Architecture Description Language Based Retargetable Symbolic Execution** **241**
15:45 - 16:00 *Andreas Ibing*

Session Title	**Hot Topic - Design Methodologies for a Cyber-Physical Systems Approach to Personalized Medicine-on-a-Chip: Challenges and Opportunities**
Session Code / Room	**3.8 / Salle LesDiguières**
Date & Time	**Tuesday, 10 March 2015, 14:30 – 16:00**
Chair	**Paul Pop**, *Technical University of Denmark, DK*
Co-Chair	**Mohammad Abdullah Al Faruque**, *University of California Irvine, US*

3.8.1 **Error Recovery in Digital Microfluidics for Personalized Medicine** **247**
14:30 - 15:00 *Mohamed Ibrahim and Krishnendu Chakrabarty*

3.8.2 **A Cyber-Physical Systems Approach to Personalized Medicine: Challenges and Opportunities for NoC-based Multicore Platforms** **253**
15:00 - 15:30 *Paul Bogdan*

3.8.3 **On-Chip Network-Enabled Many-Core Architectures for Computational Biology Applications** **259**
15:30 - 16:00 *Turbo Majumder, Partha Pratim Pande and Ananth Kalyanaraman*

Session Title	Interactive Presentations
Session Code	IP1
Date & Time	Tuesday, 10 March 2015, 16:00 – 16:30

Session Title	Implementation and Verification of Security Components
Session Code / Room	4.2 / Belle Etoile
Date & Time	Tuesday, 10 March 2015, 17:00 – 18:30
Chair	**Assia Tria**, *CEA, FR*
Co-Chair	**Wieland Fischer**, *Infineon Technologies AG, DE*

Session Title	Multi-/Manycore Scheduling
Session Code / Room	4.3 / Stendhal
Date & Time	Tuesday, 10 March 2015, 17:00 – 18:30
Chair	**Luciano Lavagno**, *Politechnico di Torino, IT*
Co-Chair	**Aviral Shrivastava**, *Arrizona State University, US*

Session Title	Exploring Reliability and Efficiency Tradeoffs at the Architectural Level
Session Code / Room	4.4 / Chartreuse
Date & Time	Tuesday, 10 March 2015, 17:00 – 18:30
Chair	**Todd Austin**, *University of Michigan, US*
Co-Chair	**Gunar Schirner**, *Northeastern University, US*

Session Title	Industrial Test and Validation Experiments
Session Code / Room	4.5 / Meije
Date & Time	Tuesday, 10 March 2015, 17:00 – 18:30
Chair	**Dan Alexandescu**, *iRoC, FR*
Co-Chair	**Emmanuel Simeu**, *TIMA, FR*

Session Title	Online Testing and Reliable Memories
Session Code / Room	4.6 / Bayard
Date & Time	Tuesday, 10 March 2015, 17:00 – 18:30
Chair	**Mihalis Psarakis**, *University of Piraeus, GR*
Co-Chair	**Cristiana Bolchini**, *Politecnico di Milano, IT*

Session Title	How Resilient Are Emerging Technologies?
Session Code / Room	4.7 / Les Bans
Date & Time	Tuesday, 10 March 2015, 17:00 – 18:30
Chair	**Vikas Chandra**, *ARM, US*
Co-Chair	**Mehdi Tahoori**, *KIT, DE*

4.7.1 17:00 - 17:30 **Digital Circuits Reliability with In-Situ Monitors in 28nm Fully Depleted SOI** **441**
M. Saliva, F. Cacho, V. Huard, X. Federspiel, D. Angot, A. Benhassain, A. Bravaix and L. Anghel

4.7.2 17:30 - 18:00 **Read/Write Robustness Estimation Metrics for Spin Transfer Torque (STT) MRAM Cell** **447**
Elena I. Vatajelu, Rosa Rodriguez-Montañés, Marco Indaco, Michel Renovell, Paolo Prinetto and Joan Figueras

4.7.3 18:00 - 18:30 **Fault Modeling in Controllable Polarity Silicon Nanowire Circuits** **453**
Hassan Ghasemzadeh Mohammadi, Pierre-Emmanuel Gaillardon and Giovanni De Micheli

Session Title	SPECIAL DAY Hot Topic: Applications of IoT
Session Code / Room	5.1 / Salle Oisans
Date & Time	Wednesday, 11 March 2015, 8:30 – 10:00
Chair	**Gabriela Nicolescu**, *Ecole Polytechnique Montreal, CA*
Co-Chair	**Ahmed Jerraya**, *CEA, FR*

5.1.1 8:30 - 8:52 **IoT for healthcare** **N/A**
Giovanni De Micheli

5.1.2 8:52 - 9:14 **IoT for smart home** **N/A**
Sylvain Paineau

5.1.3 9:14 - 9:36 **IoT for Automotive** **N/A**
Juergen Hornung

5.1.4 9:36 - 9:58 **IoT for Smart Cities** **N/A**
Levent Gurgen

Session Title	Hardware Trojan and Active Implementation Attacks
Session Code / Room	5.2 / Belle Etoile
Date & Time	Wednesday, 11 March 2015, 8:30 – 10:00
Chair	**Paolo Maistri**, *TIMA, FR*
Co-Chair	**Viktor Fischer**, *Hubert Curien Laboratory, FR*

5.2.1 8:30 - 9:00 **Improved Practical Differential Fault Analysis of Grain-128** **459**
Prakash Dey, Abhishek Chakraborty, Avishek Adhikari and Debdeep Mukhopadhyay

5.2.2 9:00 - 9:30 **A Score-Based Classification Method for Identifying Hardware-Trojans at Gate-Level Netlists** **465**
Masaru Oya, Youhua Shi, Masao Yanagisawa and Nozomu Togawa

5.2.3 9:30 - 10:00 **Hardware Trojan Detection for Gate-level ICs Using Signal Correlation Based Clustering** **471**
Burçin Çakır and Sharad Malik

Session Title	Variability Challenges in Nanoscale Circuits
Session Code / Room	5.3 / Stendhal
Date & Time	Wednesday, 11 March 2015, 8:30 – 10:00
Chair	**Pablo Garcia del Valle**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*
Co-Chair	**Muhammad Shafique**, *Karlsruhe Institute of Technology, DE*

Session Title	Emerging Technologies for NoCs
Session Code / Room	5.4 / Chartreuse
Date & Time	Wednesday, 11 March 2015, 8:30 – 10:00
Chair	**Ian O'Connor**, *University of Lyon, FR*
Co-Chair	**Davide Bertozzi**, *University of Ferrara, IT*

Session Title	Critical Embedded Systems
Session Code / Room	5.5 / Meije
Date & Time	Wednesday, 11 March 2015, 8:30 – 10:00
Chair	**Lothar Thiele**, *Swiss Federal Institute of Technology Zurich, CH*
Co-Chair	**Iain Bate**, *University of York, UK*

5.5.2 9:00 - 9:30	**Engine Control: Task Modeling and Analysis** 525 *Alessandro Biondi and Giorgio Buttazzo*	
5.5.3 9:30 - 9:45	**Evaluation of Diverse Compiling for Software-Fault Detection** 531 *Andrea Höller, Nermin Kajtazovic, Tobias Rauter, Kay Römer and Christian Kreiner*	
5.5.4 9:45 - 10:00	**Worst-Case Communication Time Analysis of Networks-on-Chip with Shared Virtual Channels** *Eberle A. Rambo and Rolf Ernst*	537

Session Title	**Analyzing and Improving Memories**
Session Code / Room	**5.6 / Bayard**
Date & Time	**Wednesday, 11 March 2015, 8:30 – 10:00**
Chair	**Bartomeu Alorda**, *Balearic Islands University, ES*
Co-Chair	**Panagiota Papavramidou**, *IMAG, FR*

5.6.1 8:30 - 9:00	**On the Statistical Memory Architecture Exploration and Optimization** 543 *Charalampos Antoniadis, Georgios Karakonstantis, Nestor Evmorfopoulos, Andreas Burg and George Stamoulis*	
5.6.2 9:00 - 9:30	**ECRIPSE: An Efficient Method for Calculating RTN-Induced Failure Probability of an SRAM Cell** *Hiromitsu Awano, Masayuki Hiromoto and Takashi Sato*	549
5.6.3 9:30 - 10:00	**Subpage Programming for Extending the Lifetime of NAND Flash Memory** 555 *Jung-Hoon Kim, Sang-Hoon Kim and Jin-Soo Kim*	

Session Title	**Architectures and Design for Cyber-Physical Systems**
Session Code / Room	**5.7 / Les Bans**
Date & Time	**Wednesday, 11 March 2015, 8:30 – 10:00**
Chair	**Rolf Ernst**, *Technische Universität Braunschweig, DE*
Co-Chair	**Paul Pop**, *Technical University of Denmark, DK*

5.7.1 8:30 - 9:00	**Optimized Selection of Reliable and Cost-Effective Cyber-Physical System Architectures** 561 *Nikunj Bajaj, Pierluigi Nuzzo, Michael Masin and Alberto Sangiovanni-Vincentelli*	
5.7.2 9:00 - 9:30	**Software Assisted Non-volatile Register Reduction for Energy Harvesting Based Cyber-Physical System** 567 *Mengying Zhao, Qingan Li, Mimi Xie, Yongpan Liu, Jingtong Hu and Chun Jason Xue*	
5.7.3 9:30 - 9:45	**A Re-entrant Flowshop Heuristic for Online Scheduling of the Paper Path in a Large Scale Printer** 573 *Umar Waqas, Marc Geilen, Jack Kandelaars, Lou Somers, Twan Basten, Sander Stuijk, Patrick Vestjens and Henk Corporaal*	
5.7.4 9:45 - 10:00	**MPIOV: Scaling Hardware-Based I/O Virtualization for Mixed-Criticality Embedded Real-Time Systems Using Non Transparent Bridges to (Multi-Core) Multi-Processor Systems** 579 *Daniel Münch, Michael Paulitsch, Oliver Hanka and Andreas Herkersdorf*	

Session Title	Hot Topic - The Next Generation of Virtual Prototyping: Ultra-fast yet Accurate Simulation of HW/SW Systems
Session Code / Room	5.8 / Salle LesDiguières
Date & Time	Wednesday, 11 March 2015, 8:30 – 10:00
Chair	**Andy D. Pimentel**, *University of Amsterdam, NL*
Co-Chair	**Christian Haubelt**, *University of Rostock, DE*

5.8.1 8:30 - 8:52 **Ultra-Fast Source-Level Timing Simulation – High Accuracy Needs Exact Code Matching [1105]** N/A
Oliver Bringmann

5.8.2 8:52 - 9:15 **Host-Compiled Operating System and Processor Modeling [1105]** N/A
Andreas Gerstlauer

5.8.3 9:15 - 9:37 **Abstract Communication Models for Accurate and Fast SoC Simulation [1105]** N/A
Daniel Mueller-Gritschneder

5.8.4 9:37 - 10:00 **Industrial Perspective on Ultra-High Speed and Timing-Accurate SoC and Peripheral Models [1105]** N/A
Ajay Goyal

Session Title	Interactive Presentations
Session Code	IP2
Date & Time	Wednesday, 11 March 2015, 10:00 – 10:30

IP2-1 **Comparison of Multi-Purpose Cores of Keccak and AES** 585
Panasayya Yalla, Ekawat Homsirikamol and Jens-Peter Kaps

IP2-2 **On-Line Prediction of NBTI-induced Aging Rates** 589
Rafal Baranowski, Farshad Firouzi, Saman Kiamehr, Chang Liu, Mehdi Tahoori and Hans-Joachim Wunderlich

IP2-3 **Retraining-Based Timing Error Mitigation for Hardware Neural Networks** 593
Jiachao Deng, Yuntan Fang, Zidong Du, Ying Wang, Huawei Li, Olivier Temam, Paolo Ienne, David Novo, Xiaowei Li, Yunji Chen and Chengyong Wu

IP2-4 **Dictionary-Based Sparse Representation for Resolution Improvement in Laser Voltage Imaging of CMOS Integrated Circuits** 597
T. Berkin Cilingiroglu, Mahmoud Zangeneh, Aydan Uyar, W. Clem Karl, Janusz Konrad, Ajay Joshi, Bennett B. Goldberg and M. Selim Unlu

IP2-5 **Fault-based Attacks on the Bel-T Block Cipher Family** 601
Philipp Jovanovic and Ilia Polian

IP2-6 **On the Premises and Prospects of Timing Speculation** 605
Rong Ye, Feng Yuan, Jie Zhang and Qiang Xu

IP2-7 **Impact of Interconnect Multiple-Patterning Variability on SRAMs** 609
Ioannis Karageorgos, Michele Stucchi, Praveen Raghavan, Julien Ryckaert, Zsolt Tokei, Diederik Verkest, Rogier Baert, Sushil Sakhare and Wim Dehaene

IP2-8 **Coherence Based Message Prediction for Optically Interconnected Chip Multiprocessors** 613
Anouk Van Laer, Chamath Ellawala, Muhammad Ridwan Madarbux, Philip M. Watts and Timothy M. Jones

IP2-9 **OpenMP and Timing Predictability: A Possible Union?** 617
Roberto Vargas, Eduardo Quinones and Andrea Marongiu

IP2-10 **SAHARA: A Security-Aware Hazard and Risk Analysis Method** 621
Georg Macher, Harald Sporer, Reinhard Berlach, Eric Armengaud and Christian Kreiner

IP2-11 **CyberPhysical-System-On-Chip (CPSoC): A Self-Aware MPSoC Paradigm with Cross-Layer Virtual Sensing and Actuation** 625
S.Sarma, N.Dutt, P.Gupta, N. Venkatasubramanian and A. Nicolau

IP2-12 **Occupancy Detection via iBeacon on Android Devices for Smart Building Management** 629
A. Corna, L. Fontana, A. A. Nacci and D. Sciuto

IP2-13 **A Neural Machine Interface Architecture for Real-Time Artificial Lower Limb Control** 633
Jason Kane, Qing Yang, Robert Hernandez, Willard Simoneau and Matthew Seaton

Session Title	**SPECIAL DAY Hot Topic: Platforms for the IoT**
Session Code / Room	**6.1 / Salle Oisans**
Date & Time	**Wednesday, 11 March 2015, 11:00 – 12:30**
Chair	**Christoph Grimm**, *TU Kaiserslautern, DE*
Co-Chair	**Marie-Minerve Louerat**, *University of Paris, FR*

6.1.1 11:00 - 11:22 **The Human Intranet — Where Swarms and Humans Meet** 637
Jan M. Rabaey

6.1.2 11:22 - 11:44 **Energy efficient electronics for the Internet of Things** N/A
Stefan Heinen

6.1.3 11:44 - 12:06 **Software Architectures for the Internet of Things** N/A
Mario Trapp

6.1.4 12:06 - 12:28 **oneM2M : a Standard for an Open and Interoperable M2M Platform, thanks to Semantic Web Tools** N/A
Marylin Arndt-Vincent

Session Title	**Physical Unclonable Functions**
Session Code / Room	**6.2 / Belle Etoile**
Date & Time	**Wednesday, 11 March 2015, 11:00 – 12:30**
Chair	**Ingrid Verbauwhede**, *KUL, BE*
Co-Chair	**Tim Güneysu**, *Ruhr University Bochum, DE*

6.2.1 11:00 - 11:30 **Efficient Attacks on Robust Ring Oscillator PUF with Enhanced Challenge-Response Set** 641
Phuong Ha Nguyen, Durga Prasad Sahoo, Rajat Subhra Chakraborty and Debdeep Mukhopadhyay

6.2.2 11:30 - 12:00 **A Robust Authentication Methodology Using Physically Unclonable Functions in DRAM Arrays** 647
Maryam S. Hashemian, Bhanu Singh, Francis Wolff, Daniel Weyer, Steve Clay and Christos Papachristou

6.2.3 12:00 - 12:30 **A Novel Modeling Attack Resistant PUF Design based on Non-linear Voltage Transfer Characteristics** 653
Arunkumar Vijayakumar and Sandip Kundu

Session Title	Emerging Low Power Techniques
Session Code / Room	6.3 / Stendhal
Date & Time	Wednesday, 11 March 2015, 11:00 – 12:30
Chair	Guillermo Payá Vayá, *Leibniz Universität Hannover, DE*
Co-Chair	Alberto Garcia-Ortiz, *U. Bremen, DE*

6.3.1 11:00 - 11:30 **Asymmetric Underlapped FinFET Based Robust SRAM Design at 7nm Node** **659**
A. Arun Goud, Rangharajan Venkatesan, Anand Raghunathan and Kaushik Roy

6.3.2 11:30 - 12:00 **Quality Configurable Reduce-and-Rank for Energy Efficient Approximate Computing** **665**
Arnab Raha, Swagath Venkataramani, Vijay Raghunathan and Anand Raghunathan

6.3.3 12:00 - 12:15 **Ultra-Low-Power ECG Front-End Design Based on Compressed Sensing** **671**
Hossein Mamaghanian and Pierre Vandergheynst

6.3.4 12:15 - 12:30 **GTFUZZ: A Novel Algorithm for Robust Dynamic Power Optimization via Gate Sizing with Fuzzy Games** **677**
Tony Casagrande and Nagarajan Ranganathan

Session Title	Bridging the Moore's Law Gap with Application-Specific Architectures
Session Code / Room	6.4 / Chartreuse
Date & Time	Wednesday, 11 March 2015, 11:00 – 12:30
Chair	Cristina Silvano, *Politecnico di Milano, IT*
Co-Chair	Lars Bauer, *KIT, DE*

6.4.1 11:00 - 11:30 **A Ultra-Low-Energy Convolution Engine for Fast Brain-Inspired Vision in Multicore Clusters** **683**
Francesco Conti and Luca Benini

6.4.2 11:30 - 12:00 **Eliminating Intra-Warp Conflict Misses in GPU** **689**
Bin Wang, Zhuo Liu, Xinning Wang and Weikuan Yu

6.4.3 12:00 - 12:15 **RNA: A Reconfigurable Architecture for Hardware Neural Acceleration** **695**
Fengbin Tu, Shouyi Yin, Peng Ouyang, Leibo Liu and Shaojun Wei

6.4.4 12:15 - 12:30 **ApproxANN: An Approximate Computing Framework for Artificial Neural Network** **701**
Qian Zhang, Ting Wang, Ye Tian, Feng Yuan and Qiang Xu

Session Title	Multimedia and Consumer Electronics
Session Code / Room	6.5 / Meije
Date & Time	Wednesday, 11 March 2015, 11:00 – 12:30
Chair	Theo Theocharides, *University of Cyprus, CY*
Co-Chair	Marcello Coppola, *STMicroelectronics, FR*

6.5.1 11:00 - 11:30 **DRAM or no-DRAM? Exploring Linear Solver Architectures for Image Domain Warping in 28 nm CMOS** **707**
Michael Schaffner, Frank K. Gürkaynak, Aljoscha Smolic and Luca Benini

6.5.2 11:30 - 12:00 **A Small Non-Volatile Write Buffer to Reduce Storage Writes in Smartphones** **713**
Mungyu Son, Sungkwang Lee, Kyungho Kim, Sungjoo Yoo and Sunggu Lee

6.5.3 12:00 - 12:15 **Clustering-Based Multi-Touch Algorithm Framework for the Tracking Problem with a Large Number of Points** **719**
Shih-Lun Huang, Sheng-Yi Hung and Chung-Ping Cheny

6.5.4 **A Low Energy 2D Adaptive Median Filter Hardware** **725**
12:15 - 12:30 *Ercan Kalali and Ilker Hamzaoglu*

Session Title	**Panel - The Future of Electronics, Semiconductor, and Design in Europe**
Session Code / Room	**6.6 / Bayard**
Date & Time	**Wednesday, 11 March 2015, 11:00 – 12:30**
Chair	**Giovanni De Micheli**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*
Co-Chair	**(.) (.)**, *(.), (.)*

6.6.1 **Panelist [1146]** **N/A**
Giovanni De Micheli

6.6.2 **Panelist [1146]** **N/A**
Jalal Bagherli

6.6.3 **Panelist [1146]** **N/A**
Thierry Collette

6.6.4 **Panelist [1146]** **N/A**
Antun Domic

6.6.5 **Panelist [1146]** **N/A**
Horst Symanzik

6.6.6 **Panelist [1146]** **N/A**
Sir Hossein Yassaye

Session Title	**Application-Mapping Strategies for Many-Cores**
Session Code / Room	**6.7 / Les Bans**
Date & Time	**Wednesday, 11 March 2015, 11:00 – 12:30**
Chair	**Amit Kumar Singh**, *University of York, UK*
Co-Chair	**Marc Geilen**, *Eindhoven University of Technology, NL*

6.7.1 **Adaptive on-the-Fly Application Performance Modeling for Many Cores** **730**
11:00 - 11:30 *Sebastian Kobbe, Lars Bauer and Jörg Henkel*

6.7.2 **Customization of OpenCL Applications for Efficient Task Mapping under** **736**
11:30 - 12:00 **Heterogeneous Platform Constraints**
Edoardo Paone, Francesco Robino, Gianluca Palermo, Vittorio Zaccaria, Ingo Sander and Cristina Silvano

6.7.3 **Enabling Multi-threaded Applications on Hybrid Shared Memory Manycore** **742**
12:00 - 12:30 **Architectures**
Tushar Rawat and Aviral Shrivastava

Session Title	**SPECIAL DAY Keynote**
Session Code / Room	**7.0 / (.)**
Date & Time	**Wednesday, 11 March 2015, 12:50 – 14:30**
Chair	**(.) (.)**, *(.), (.)*
Co-Chair	**(.) (.)**, *(.), (.)*

7.0.1(Keynote) **SPECIAL DAY Keynote: Industrie 4.0: From the Internet of Things to Cyber-Physical** **N/A**
12:50 - 13:20 **Production Systems**
Wolfgang Wahlster

7.0.2(Keynote) **SPECIAL DAY Keynote: The Rise of IoT, and the Role of EDA** **N/A**
13:20 - 13:50 *Antun Domic*

Session Title	**SPECIAL DAY Hot Topic: Design Tools for the IoT**
Session Code / Room	**7.1 / Salle Oisans**
Date & Time	**Wednesday, 11 March 2015, 14:30 – 16:00**
Chair	**Frank Schirrmeister**, *Cadence, US*
Co-Chair	**(.) (.)**, *(.), (.)*

7.1.1 **IoT Challenges and Opportunities** **N/A**
14:30 - 14:52 *Hannes Schwaderer*

7.1.2 **IoT Development for a Connected Car** N/A
14:52 - 15:14 *Marco Bekooij*

7.1.3 **If It's Not on the Internet, It's Just a Thing: but what are the IoT problems to solve?** **N/A**
15:14 - 15:36 *Remy Pottier*

7.1.4 **IoT Hardware & Mixed Signal Development** **N/A**
15:36 - 15:58 *Ian Dennison*

Session Title	**Hot Topic - Trading Accuracy for Efficient Computing**
Session Code / Room	**7.2 / Belle Etoile**
Date & Time	**Wednesday, 11 March 2015, 14:30 – 16:00**
Chair	**Muhammad Shafique**, *KIT: Karlsruhe Institute of Technology, DE*
Co-Chair	**Marc Geilen**, *Eindhoven University of Technology, NL*

7.2.1 **Computing Approximately, and Efficiently** **748**
14:30 - 14:52 *Swagath Venkataramani, Srimat T. Chakradhar, Kaushik Roy and Anand Raghunathan*

7.2.2 **Novel Inexact Memory Aware Algorithm Co-design for Energy Efficient Computation — Algorithmic Principles** **752**
14:52 - 15:15 *Guru Prakash Arumugam, Prashanth Srikanthan, John Augustine, Krishna Palem, Eli Upfal, Ayush Bhargava, Parishkrati and Sreelatha Yenugula*

7.2.3 **Designing Inexact Systems Efficiently Using Elimination Heuristics** **758**
15:15 - 15:37 *Shyamsundar Venkataraman, Akash Kumar, Jeremy Schlachter and Christian Enz*

7.2.4 **Opportunities for Energy Efficient Computing: A Study of Inexact General Purpose Processors for High-Performance and Big-Data Applications** **764**
15:37 - 16:00 *Peter Düben, Jeremy Schlachter, Parishkrati, Sreelatha Yenugula, John Augustine, Christian Enz, K. Palem and T. N. Palmer*

Session Title	**Hot Topic - Advances in Hardware Trojans Detection**
Session Code / Room	**7.3 / Stendhal**
Date & Time	**Wednesday, 11 March 2015, 14:30 – 16:00**
Chair	**Giorgio Di Natale**, *LIRMM, CNRS/University of Montpellier, FR*
Co-Chair	

7.3.1 **Introduction to Hardware Trojans Detection Methods** **770**
14:30 - 14:45 *Julien Francq and Florian Frick*

7.3.2 **New Testing Procedure for Finding Insertion Sites of Stealthy Hardware Trojans** **776**
14:45 - 15:00 *Sophie Dupuis, Papa-Sidy Ba, Marie-Lise Flottes, Giorgio Di Natale and Bruno Rouzeyre*

7.3.3 15:00 - 15:30 **Hardware Trojan Detection by Delay and Electromagnetic Measurements** **782**
X.-T. Ngo, I. Exurville, S. Bhasin, J.-L. Danger, S. Guilley, Z. Najm, J.-B. Rigaud and B. Robisson

7.3.4 15:30 - 16:00 **A High Efficiency Hardware Trojan Detection Technique Based on Fast SEM Imaging** **788**
Franck Courbon, Philippe Loubet-Moundi, Jacques J.A. Fournier and Assia Tria

Session Title	**Routing Advances for Fault-tolerant and Multicast NoCs**
Session Code / Room	**7.4 / Chartreuse**
Date & Time	**Wednesday, 11 March 2015, 14:30 – 16:00**
Chair	**Fabien Clermidy**, *CEA, FR*
Co-Chair	**Masoud Daneshtalab**, *University of Turku, FI*

7.4.1 14:30 - 15:00 **Mixed Wire and Surface-wave Communication Fabrics for Decentralized On-Chip Multicasting** **794**
Ammar Karkar, Kin-Fai Tong, Terrence Mak and Alex Yakovlev

7.4.2 15:00 - 15:30 **d^2 -LBDR: Distance-Driven Routing to Handle Permanent Failures in 2D Mesh NoCs** **800**
Rimpy Bishnoi, Vijay Laxmi, Manoj Singh Gaur and José Flich

7.4.3 15:30 - 16:00 **Synergistic Use of Multiple On-Chip Networks for Ultra-Low Latency and Scalable Distributed Routing Reconfiguration** **806**
Marco Balboni, José Flich and Davide Bertozzi

Session Title	**System Reliability: from Runtime to Design Languages**
Session Code / Room	**7.5 / Meije**
Date & Time	**Wednesday, 11 March 2015, 14:30 – 16:00**
Chair	**Dirk Stroobandt**, *University of Gent, BE*
Co-Chair	**Diana Goehringer**, *University of Bochum, DE*

7.5.1 14:30 - 15:00 **Axilog: Language Support for Approximate Hardware Design** **812**
Amir Yazdanbakhsh, Divya Mahajan, Bradley Thwaites, Jongse Park, Anandhavel Nagendrakumar, Sindhuja Sethuraman, Kartik Ramkrishnan, Nishanthi Ravindran, Rudra Jariwala, Abbas Rahimi, Hadi Esmaeilzadeh and Kia Bazargan

7.5.2 15:00 - 15:30 **Improving MPSoC Reliability through Adapting Runtime Task Schedule based on Time-Correlated Fault Behavior** **818**
Laura A. Rozo Duque, Jose M. Monsalve Diaz and Chengmo Yang

7.5.3 15:30 - 15:45 **ACSEM: Accuracy-Configurable Fast Soft Error Masking Analysis in Combinatorial Circuits** **824**
Florian Kriebel, Semeen Rehman, Duo Sun, Pau Vilimelis Aceituno, Muhammad Shafique and Jörg Henkel

7.5.4 15:45 - 16:00 **Energy Minimization for Fault Tolerant Scheduling of Periodic Fixed-Priority Applications on Multiprocessor Platforms** **830**
Qiushi Han, Ming Fan, Linwei Niu and Gang Quan

Session Title	Test Power and 3-D Fault Tolerance
Session Code / Room	7.6 / Bayard
Date & Time	Wednesday, 11 March 2015, 14:30 – 16:00
Chair	**Juergen Schloeffel**, *Mentor, DE*
Co-Chair	**Sybille Hellebrand**, *Universität Paderborn, DE*

Session Title	Energy-efficient Computing
Session Code / Room	7.7 / Les Bans
Date & Time	Wednesday, 11 March 2015, 14:30 – 16:00
Chair	**Damien Querlioz**, *CNRS-IEF, FR*
Co-Chair	**Swaroop Ghosh**, *University of South Florida, US*

Session Title	Interactive Presentations
Session Code	IP3
Date & Time	Wednesday, 11 March 2015, 16:00 – 16:30

Session Title	**SPECIAL DAY Panel: Security and Verification for the IoT**
Session Code / Room	**8.1 / Salle Oisans**
Date & Time	**Wednesday, 11 March 2015, 17:00 – 18:30**
Chair	**Dominique Borrione**, *TIMA Lab, UGA, FR*
Co-Chair	**Guy Gogniat**, *Lab-STICC, Université de Bretagne-Sud, Lorient, FR*

8.1.5 **Panelist** **N/A**
Wayne Burleson

Session Title	**Flash Memories & Numerical Approximation**
Session Code / Room	**8.2 / Belle Etoile**
Date & Time	**Wednesday, 11 March 2015, 17:00 – 18:30**
Chair	**Philippe Coussy**, *Universite de Bretagne-Sud, FR*
Co-Chair	**Zili Shao**, *HongKong Polytechnic University, HK*

8.2.1 17:00 - 17:30 **HLC: Software-Based Half-Level-Cell Flash Memory** **936**
Han-Yi Lin and Jen-Wei Hsieh

8.2.2 17:30 - 18:00 **AHEAD: Automated Framework for Hardware Accelerated Iterative Data Analysis** **942**
Ebrahim M. Songhori, Azalia Mirhoseini, Xuyang Lu and Farinaz Koushanfar

8.2.3 18:00 - 18:30 **Design Method for Multiplier-Less Two-Variable Numeric Function Approximation** **948**
Jochen Rust and Steffen Paul

Session Title	**Dynamic Thermal Management for Multi-cores**
Session Code / Room	**8.3 / Stendhal**
Date & Time	**Wednesday, 11 March 2015, 17:00 – 18:30**
Chair	**Georgios Karakonstantis**, *Queen's University, UK*
Co-Chair	**José Luis Ayala**, *Complutense University of Madrid, ES*

8.3.1 17:00 - 17:30 **A Thermal Stress-Aware Algorithm for Power and Temperature Management of MPSoCs** **954**
Mehdi Kamal, Arman Iranfar, Ali Afzali-Kusha and Massoud Pedram

8.3.2 17:30 - 18:00 **Predictive Dynamic Thermal and Power Management for Heterogeneous Mobile Platforms** **960**
Gaurav Singla, Gurinderjit Kaur, Ali K. Unver and Umit Y. Ogras

8.3.3 18:00 - 18:30 **Power-Efficient Control of Thermoelectric Coolers Considering Distributed Hot Spots** **966**
Mohammad Javad Dousti and Massoud Pedram

Session Title	**Industrial System Design Opportunities**
Session Code / Room	**8.4 / Chartreuse**
Date & Time	**Wednesday, 11 March 2015, 17:00 – 18:30**
Chair	**Wehn Norbert**, *University of Kaiserslautern, DE*
Co-Chair	**David Raphael**, *CEA-LIST, FR*

8.4.1 17:00 - 17:15 **DSP Based Programmable FHD HEVC Decoder** **972**
Sangjo Lee, Joonho Song, Wonchang Lee, Doohyun Kim, Jaehyun Kim and Shihwa Lee

8.4.2 17:15 - 17:30 **Accelerating Complex Brain-Model Simulations on GPU Platforms** **974**
H.A. Du Nguyen, Zaid Al-Ars, Georgios Smaragdos and Christos Strydis

8.4.3 17:30 - 17:45 **A Packet-switched Interconnect for Many-core Systems with BE and RT Service** **980**
Runan Ma, Zhida Hui and Axel Jantsch

8.4.4 17:45 - 18:00 **Reducing Trace Size in Multimedia Applications Endurance Tests** **984**
Serge Vladimir Emteu Tchagou, Alexandre Termier, Jean-Franois Méhaut, Brice Videau, Miguel Santana and Ren Quiniou

8.4.5 18:00 - 18:15 **Exploration and Design of Embedded Systems Including Neural Algorithms** **986**
Jean-Marc Philippe, Alexandre Carbon, Olivier Brousse and Michel Paindavoine

8.4.6 18:15 - 18:30 **A New Distributed Framework for Integration of District Energy Data from Heterogeneous Devices** 992
Francesco G. Brundu, Edoardo Patti, Andrea Acquaviva, Michelangelo Grosso, Gaetano Rasconà, Salvatore Rinaudo and Enrico Macii

Session Title	**Hot Topic - Spintronics based Computing**
Session Code / Room	**8.5 / Meije**
Date & Time	**Wednesday, 11 March 2015, 17:00 – 18:30**
Chair	**Lionel Torres**, *LIRMM, CNRS/University of Montpellier, FR*
Co-Chair	**Weisheng Zhao**, *University Paris--Sud/CNRS, FR*

8.5.1 17:00 - 17:20 **Spintronic Devices as Key Elements for Energy-Efficient Neuroinspired Architectures** 994
Nicolas Locatelli, Adrien F. Vincent, Alice Mizrahi, Joseph S. Friedman, Damir Vodenicarevic, Joo-Von Kim, Jacques-Olivier Klein, Weisheng Zhao, Julie Grollier and Damien Querlioz

8.5.2 17:20 - 17:40 **Giant Spin Hall Effect (GSHE) Logic Design for Low Power Application** 1000
Yaojun Zhang, Bonan Yan, Wenqing Wu, Hai Li and Yiran Chen

8.5.3 17:40 - 18:00 **Spintronics-Based Nonvolatile Logic-in-Memory Architecture Towards an Ultra-Low-Power and Highly Reliable VLSI Computing Paradigm** 1006
Takahiro Hanyu, Daisuke Suzuki, Naoya Onizawa, Shoun Matsunaga, Masanori Natsui and Akira Mochizuki

8.5.4 18:00 - 18:15 **Potential Applications Based on NVM Emerging Technologies** 1012
Sophiane Senni, Raphael Martins Brum, Lionel Torres, Gilles Sassatelli, Abdoulaye Gamatie and Bruno Mussard

8.5.5 18:15 - 18:30 **From Device to System: Cross-layer Design Exploration of Racetrack Memory** 1018
Guangyu Sun, Chao Zhang, Hehe Li, Yue Zhang, Weiqi Zhang, Yizi Gu, Yinan Sun, J.-O. Klein, D. Ravelosona, Yongpan Liu, Weisheng Zhao and Huazhong Yang

Session Title	**Statistical Answers to Analog/Mixed Signal Design and Test Problems**
Session Code / Room	**8.6 / Bayard**
Date & Time	**Wednesday, 11 March 2015, 17:00 – 18:30**
Chair	**Jacob Abraham**, *Univ. Texas Austin, US*
Co-Chair	**Michel Renovell**, *LIRMM/CNRS, FR*

8.6.1 17:00 - 17:30 **Efficient Bit Error Rate Estimation for High-Speed Link by Bayesian Model Fusion** 1024
Chenlei Fang, Qicheng Huang, Fan Yang, Xuan Zeng, Xin Li and Chenjie Gu

8.6.2 17:30 - 18:00 **Fast Deployment of Alternate Analog Test Using Bayesian Model Fusion** 1030
John Liaperdos, Haralampos-G. Stratigopoulos, Louay Abdallah, Yiorgos Tsiatouhas, Angela Arapoyanni and Xin Li

8.6.3 18:00 - 18:15 **Bordersearch: An Adaptive Identification of Failure Regions** 1036
Markus Dobler, Manuel Harrant, Monica Rafaila, Georg Pelz, Wolfgang Rosenstiel and Martin Bogdan

8.6.4 18:15 - 18:30 **A Fast Spatial Variation Modeling Algorithm for Efficient Test Cost Reduction of Analog/RF Circuits** 1042
Hugo Gonçalves, Xin Li, Miguel Correia, Vitor Tavares, John Carulli and Kenneth Butler

Session Title	Compilers and Tools for Performance
Session Code / Room	8.7 / Les Bans
Date & Time	Wednesday, 11 March 2015, 17:00 – 18:30
Chair	**Frank Hannig**, *Erlangen University, DE*
Co-Chair	**Christian Haubelt**, *University of Rostock, DE*

8.7.1 17:00 - 17:30 **Bytecode-to-C Ahead-of-Time Compilation for Android Dalvik Virtual Machine** **1048**
Hyeong-Seok Oh, Ji Hwan Yeo and Soo-Mook Moon

8.7.2 17:30 - 18:00 **A Basic Linear Algebra Compiler for Embedded Processors** **1054**
Nikolaos Kyrtatas, Daniele G. Spampinato and Markus Püschel

8.7.3 18:00 - 18:30 **VARSHA: Variation and Reliability-Aware Application Scheduling with Adaptive Parallelism in the Dark-Silicon Era** **1060**
Nishit Kapadia and Sudeep Pasricha

Session Title	SPECIAL DAY Hot Topic: Game-changing Innovative Technology Platforms for Health Care
Session Code / Room	9.1 / Salle Oisans
Date & Time	Thursday, 12 March 2015, 8:30 – 10:00
Chair	**Jo De Boeck**, *IMEC, BE*
Co-Chair	**(.) (.)**, *(.), (.)*

9.1.1 8:30 - 9:00 **Game changing innovation in Technology and Design for effective health care** **N/A**
Chris Van Hoof

9.1.2 9:00 - 9:30 **Advanced Self-Powered Systems of Integrated Sensors and Technologies** **N/A**
Veena Misra

9.1.3 9:30 - 10:00 **Healthcare in an Integrated Digital World** **N/A**
Jean-Paul Linnartz

Session Title	Hot Topic - Transparent Use of Accelerators in Heterogeneous Computing Systems
Session Code / Room	9.2 / Belle Etoile
Date & Time	Thursday, 12 March 2015, 8:30 – 10:00
Chair	**Christian Plessl**, *University of Paderborn, DE*
Co-Chair	**Heiner Giefers**, *IBM Research Zurich, CH*

9.2.1 8:30 - 8:52 **Transparent Acceleration of Program Execution Using Reconfigurable Hardware** **1066**
Nuno Paulino, João Canas Ferreira, João Bispo and João M. P. Cardoso

9.2.2 8:52 - 9:15 **Accelerating Arithmetic Kernels with Coherent Attached FPGA Coprocessors** **1072**
Heiner Giefers, Raphael Polig and Christoph Hagleitner

9.2.3 9:15 - 9:37 **Transparent Offloading of Computational Hotspots from Binary Code to Xeon Phi** **1078**
Marvin Damschen, Heinrich Riebler, Gavin Vaz and Christian Plessl

9.2.4 9:37 - 10:00 **Transparent Linking of Compiled Software and Synthesized Hardware** **1084**
David B. Thomas, Shane T. Fleming, George A. Constantinides and Dan R. Ghica

Session Title	NoC Optimization
Session Code / Room	9.3 / Stendhal
Date & Time	Thursday, 12 March 2015, 8:30 – 10:00
Chair	**Marcello Coppola**, *ST Microelectronics, FR*
Co-Chair	**José Flich**, *Universidad Politecnica de Valencia, ES*

9.3.1 8:30 - 9:00 **PhaseNoC: TDM Scheduling at the Virtual-Channel Level for Efficient Network Traffic Isolation** **1090**
A. Psarras, I. Seitanidis, C. Nicopoulos and G. Dimitrakopoulos

9.3.2 9:00 - 9:30 **Rate-based vs Delay-Based Control for DVFS in NoC** **1096**
Mario R. Casu and Paolo Giaccone

9.3.3 9:30 - 10:00 **NoC-Enabled Multicore Architectures for Stochastic Analysis of Biomolecular Reactions** **1102**
Turbo Majumder, Xian Li, Paul Bogdan and Partha Pande

Session Title	Advanced Trends in Alternative Technologies
Session Code / Room	9.4 / Chartreuse
Date & Time	Thursday, 12 March 2015, 8:30 – 10:00
Chair	**Martin Trefzer**, *University of York, UK*
Co-Chair	**Yvain Thonnart**, *CEA-LETI, FR*

9.4.1 8:30 - 9:00 **Optimization of Quantum Computer Architecture using a Resource-Performance Simulator** **1108**
Muhammad Ahsan and Jungsang Kim

9.4.2 9:00 - 9:30 **Volume-Oriented Sample Preparation for Reactant Minimization on Flow-Based Microfluidic Biochips with Multi-Segment Mixers** **1114**
Chi-Mei Huang, Chia-Hung Liu and Juinn-Dar Huang

9.4.3 9:30 - 10:00 **Thermal Aware Design Method for VCSEL-Based On-Chip Optical Interconnect** **1120**
Hui Li, Alain Fourmigue, Sébastien Le Beux, Xavier Letartre, Ian O'Connor and Gabriela Nicolescu

Session Title	Modeling and Simulation of Extra-Functional Properties
Session Code / Room	9.5 / Meije
Date & Time	Thursday, 12 March 2015, 8:30 – 10:00
Chair	**Sylvian Kaiser**, *DOCEA Power, FR*
Co-Chair	**Sander Stuijk**, *TU Eindhoven, NL*

9.5.1 8:30 - 9:00 **Dynamic Power and Performance Back-Annotation for Fast and Accurate Functional Hardware Simulation** **1126**
Dongwook Lee, Lizy K. John and Andreas Gerstlauer

9.5.2 9:00 - 9:30 **Fast and Precise Cache Performance Estimation for Out-Of-Order Execution** **1132**
Roeland J. Douma, Sebastian Altmeyer and Andy D. Pimentel

9.5.3 9:30 - 10:00 **A Calibration Based Thermal Modeling Technique for Complex Multicore Systems** **1138**
Devendra Rai and Lothar Thiele

Session Title	**Design, Synthesis and Validation of Analog Circuits**
Session Code / Room	**9.6 / Bayard**
Date & Time	**Thursday, 12 March 2015, 8:30 – 10:00**
Chair	**Marie-Minerve Louerat**, *LIP6/CNRS, FR*
Co-Chair	**Georges Gielen**, *ESAT - KU Leuven, BE*

9.6.1 8:30 - 9:00 **Knowledge-Intensive, Causal Reasoning for Analog Circuit Topology Synthesis in Emergent and Innovative Applications** **1144**
Fanshu Jiao, Sergio Montano and Alex Doboli

9.6.2 9:00 - 9:30 **A CNN-Inspired Mixed Signal Processor Based on Tunnel Transistors** **1150**
Behnam Sedighi, Indranil Palit, X. Sharon Hu, Joseph Nahas and Michael Niemier

9.6.3 9:30 - 9:45 **Layout-Aware Sizing of Analog ICs using Floorplan & Routing Estimates for Parasitic Extraction** **1156**
Nuno Lourenço, Ricardo Martins and Nuno Horta

9.6.4 9:45 - 10:00 **Initial Transient Response of Oscillators with Long Settling Time** **1162**
Hans Georg Brachtendorf and Kai Bittner

Session Title	**Test Generation, Fault Simulation and Diagnosis**
Session Code / Room	**9.7 / Les Bans**
Date & Time	**Thursday, 12 March 2015, 8:30 – 10:00**
Chair	**Jacob Abraham**, *The University of Texas at Austin, US*
Co-Chair	**Bernd Becker**, *University Freiburg, DE*

9.7.1 8:30 - 9:00 **Quick Error Detection Tests with Fast Runtimes for Effective Post-Silicon Validation and Debug** **1168**
David Lin, Eswaran S., Sharad Kumar, Eric Rentschler and Subhasish Mitra

9.7.2 9:00 - 9:30 **GPU-Accelerated Small Delay Fault Simulation** **1174**
Eric Schneider, Stefan Holst, Michael A. Kochte, Xiaoqing Wen and Hans-Joachim Wunderlich

9.7.3 9:30 - 9:45 **Fault Simulation with Parallel Exact Critical Path Tracing in Multiple Core Environment** **1180**
Maksim Gorev, Raimund Ubar and Sergei Devadze

9.7.4 9:45 - 10:00 **On the Automatic Generation of SBST Test Programs for In-Field Test** **1186**
Andreas Riefert, Riccardo Cantoro, Matthias Sauer Matteo Sonza Reorda and Bernd Becker

Session Title	**Hot Topic - Monolithic 3D: A Path to Real 3D Integrated Chips**
Session Code / Room	**9.8 / Salle LesDiguières**
Date & Time	**Thursday, 12 March 2015, 8:30 – 10:00**
Chair	**Giovanni De Micheli**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*
Co-Chair	**Ian O'Connor**, *Institut des Nanotechnologies de Lyon, FR*

9.8.1 8:30 - 9:00 **A Comprehensive Study of Monolithic 3D Cell on Cell Design Using Commercial 2D Tool** **1192**
O. Billoint, H. Sarhan, I. Rayane, M. Vinet, P. Batude, C. Fenouillet-Beranger, O. Rozeau, G. Cibrario, F. Deprat, A. Fustier, J.-E. Michallet, O. Faynot, O. Turkyilmaz, J.-F. Christmann, S. Thuries and F. Clermidy

9.8.2 9:00 - 9:30 **Monolithic 3D Integration: A Path from Concept to Reality** **1197**
Max M. Shulaker, Tony F. Wu, Mohamed M. Sabry, Hai Wei, H.-S. Philip Wong and Subhasish Mitra

9.8.3 **A Ultra-Low-Power FPGA Based on Monolithically Integrated RRAMs 1203**
9:30 - 10:00 *Pierre-Emmanuel Gaillardon, Xifan Tang, Jury Sandrini, Maxime Thammasack, Somayyeh Rahimian Omam, Davide Sacchetto, Yusuf Leblebici and Giovanni De Micheli*

Session Title	**Interactive Presentations**
Session Code	**IP4**
Date & Time	**Thursday, 12 March 2015, 10:00 – 10:30**

IP4-1 **PWL: A Progressive Wear Leveling to Minimize Data Migration Overheads for NAND Flash Devices 1209**
Fu-Hsin Chen, Ming-Chang Yang, Yuan-Hao Chang and Tei-Wei Kuo

IP4-2 **Towards Trustable Storage Using SSDs with Proprietary FTL 1213**
Xiaotong Cui, Minhui Zou, Liang Shi and Kaijie Wu

IP4-3 **User-Specific Skin Temperature-Aware DVFS for Smartphones 1217**
Begum Egilmez, Gokhan Memik, Seda Ogrenci-Memik and Oguz Ergin

IP4-4 **Formal Probabilistic Analysis of Distributed Dynamic Thermal Management 1221**
Shafaq Iqtedar, Osman Hasan, Muhammad Shafique and Jörg Henkel

IP4-5 **A Hybrid Quasi Monte Carlo Method for Yield Aware Analog Circuit Sizing Tool 1225**
Engin Afacan, Gönenç Berkol, Ali Emre Pusane, Günhan Dündar and Faik Baskaya

IP4-6 **Feature Selection for Alternate Test Using Wrappers: Application to an RF LNA Case Study 1229**
Manuel J. Barragan and Gildas Leger

IP4-7 **Improving SIMD Code Generation in QEMU 1233**
Sheng-Yu Fu, Jan-Jan Wu and Wei-Chung Hsu

IP4-8 **Reuse Distance Analysis for Locality Optimization in Loop-Dominated Applications** 1237
Christakis Lezos, Grigoris Dimitroulakos and Konstantinos Masselos

IP4-9 **TAPP: Temperature-Aware Application Mapping for NoC-Based Many-Core Processors 1241**
Di Zhu, Lizhong Chen, Timothy M. Pinkston and Massoud Pedram

IP4-10 **Malleable NoC: Dark Silicon Inspired Adaptable Network-on-Chip 1245**
Haseeb Bokhari, Haris Javaid, Muhammad Shafique Jörg Henkel and Sri Parameswaran

IP4-11 **Topology Identification for Smart Cells in Modular Batteries 1249**
Sebastian Steinhorst and Martin Lukasiewycz

IP4-12 **LVS Check for Photonic Integrated Circuits – Curvilinear Feature Extraction and Validation 1253**
Ruping Cao, Julien Billoudet, John Ferguson, Lionel Couder, John Cayo, Alexandre Arriordaz and Ian O'Connor

IP4-13 **FP-Scheduling for Mode-Controlled Dataflow: A Case Study 1257**
Alok Lele, Orlando Moreira and Kees van Berkel

IP4-14 **Ageing Simulation of Analogue Circuits and Systems using Adaptive Transient Evaluation 1261**
Felix Salfelder and Lars Hedrich

IP4-15 **A Tool for the Assisted Design of Charge Redistribution SAR ADCs 1265**
S. Brenna, A. Bonetti, A. Bonfanti and A. L. Lacaita

IP4-16 **Detection of Asymmetric Aging-Critical Voltage Conditions in Analog Power-Down Mode 1269**
Michael Zwerger and Helmut Graeb

IP4-17	**High Performance Single Supply CMOS Inverter Level up Shifter for Multi–Supply Voltages Domains** *José C. García, Juan A. Montiel–Nelson, J. Sosa and Saeid Nooshabadi*	**1273**
IP4-18	**Exploring the Impact of Functional Test Programs Re-Used for Power-Aware Testing** *A. Touati, A. Bosio, L. Dilillo, P. Girard, A. Virazel, P. Bernardi M.Sonza Reorda*	**1277**
IP4-19	**A Breakpoint-Based Silicon Debug Technique with Cycle-Granularity for Handshake-Based SoC** *Hsin-Chen Chen, Cheng-Rong Wu, Katherine Shu-Min Li and Kuen-Jong Lee*	**1281**
IP4-20	**Fault Diagnosis in Designs with Extreme Low Pin Test Data Compressors** *Subhadip Kundu, Parthajit Bhattacharya and Rohit Kapur*	**1285**
IP4-21	**Optimizing Dynamic Trace Signal Selection Using Machine Learning and Linear Programming** *Charlie Shucheng Zhu and Sharad Malik*	**1289**

Session Title	**SPECIAL DAY Hot Topic: Wearable Medical Applications**
Session Code / Room	**10.1 / Salle Oisans**
Date & Time	**Thursday, 12 March 2015, 11:00 – 12:30**
Chair	**Renzo Dal Molin**, *Sorin Group, FR*
Co-Chair	**Chris Van Hoof**, *IMEC, BE*

10.1.1 11:00 - 11:30	**Mobile health monitoring: adoption and system challenges** *David Shanes*	**N/A**
10.1.2 11:30 - 12:00	**Wearable Device For Physical and Emotional Health Monitoring** *Srinivasan Murali*	**N/A**
10.1.3 12:00 - 12:30	**Gait Analysis for Fall Prediction Using Hierarchical Textile-Based Capacitive Sensor Arrays** *Rebecca Baldwin, Stan Bobovych, Ryan Robucci, Chintan Patel and Nilanjan Banerjee*	**1293**

Session Title	**Emerging Memory Architectures**
Session Code / Room	**10.2 / Belle Etoile**
Date & Time	**Thursday, 12 March 2015, 11:00 – 12:30**
Chair	**Luca Perniola**, *CEA-LETI, FR*
Co-Chair	**Pierre-Emmanuel Gaillardon**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*

10.2.1 11:00 - 11:30	**HReRAM: A Hybrid Reconfigurable Resistive Random-Access Memory** *Miguel Angel Lastras-Montaño, Amirali Ghofrani and Kwang-Ting Cheng*	**1299**
10.2.2 11:30 - 12:00	**nCode: Limiting Harmful Writes to Emerging Mobile NVRAM through Code Swapping** *Kan Zhong, Duo Liu, Linbo Long, Xiao Zhu, Weichen Liu, Qingfeng Zhuge and Edwin H.-M. Sha*	**1305**
10.2.3 12:00 - 12:15	**System Level Exploration of a STT-MRAM based Level 1 Data-Cache** *Manu Perumkunnil Komalan, Christian Tenllado, José Ignacio Gómez Pérez, Francisco Tirado Fernández and Francky Catthoor*	**1311**
10.2.4 12:15 - 12:30	**High Performance AXI-4.0 Based Interconnect for Extensible Smart Memory Cube** *Erfan Azarkhish, Davide Rossi, Igor Loi and Luca Benini*	**1317**

Session Title	**Modern Architectures for Real-Time Systems**
Session Code / Room	**10.3 / Stendhal**
Date & Time	**Thursday, 12 March 2015, 11:00 – 12:30**
Chair	**Benny Akesson**, *Czech Technical University in Prague, CZ*
Co-Chair	**Rodolfo Pellizzoni**, *University of Waterloo, CA*

Session Title	**Energy Aware Data Center: Design and Management**
Session Code / Room	**10.4 / Chartreuse**
Date & Time	**Thursday, 12 March 2015, 11:00 – 12:30**
Chair	**Carlo Cavazzoni**, *Cineca, IT*
Co-Chair	**Andreas Burg**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*

Session Title	**Reconfigurable Architectures and Applications**
Session Code / Room	**10.5 / Meije**
Date & Time	**Thursday, 12 March 2015, 11:00 – 12:30**
Chair	**Christian Plessl**, *University of Paderborn, DE*
Co-Chair	**Enno Lübbers**, *Intel Labs Europe, DE*

Session Title	Circuit Design and Test: From Characterization to Measurement
Session Code / Room	10.6 / Bayard
Date & Time	Thursday, 12 March 2015, 11:00 – 12:30
Chair	Salvador Mir, *TIMA/CNRS, FR*
Co-Chair	Christoph Grimm, *TU Kaiserslautern, DE*

10.6.1 11:00 - 11:30 **Fast Eye Diagram Analysis for High-Speed CMOS Circuits** 1377
Seyed Nematollah Ahmadyan, Chenjie Gu, Suriyaprakash Natarajan, Eli Chiprout and Shobha Vasudevan

10.6.2 11:30 - 12:00 **Statistical Library Characterization Using Belief Propagation Across Multiple Technology Nodes** 1383
Li Yu, Sharad Saxena, Christopher Hess, Ibrahim (Abe) M. Elfadel, Dimitri Antoniadis and Duane Boning

10.6.3 12:00 - 12:15 **Combining Adaptive Alternate Test and Multi-Site** 1389
Gildas Leger

10.6.4 12:15 - 12:30 **A Method for the Estimation of Defect Detection Probability of Analog/RF Defect-Oriented Tests** 1395
John Liaperdos, Angela Arapoyanni and Yiorgos Tsiatouhas

Session Title	Expanding the Applicability of Formal Methods
Session Code / Room	10.7 / Les Bans
Date & Time	Thursday, 12 March 2015, 11:00 – 12:30
Chair	Barbara Jobstmann, *École Polytechnique Fédérale de Lausanne (EPFL), CH*
Co-Chair	Christoph Scholl, *University Freiburg, DE*

10.7.1 11:00 - 11:30 **Automated Rectification Methodologies to Functional State-Space Unreachability** 1401
Ryan Berryhill and Andreas Veneris

10.7.2 11:30 - 12:00 **Over-Approximating Loops to Prove Properties Using Bounded Model Checking** 1407
Priyanka Darke, Bharti Chimdyalwar, R. Venkatesh, Ulka Shrotri and Ravindra Metta

10.7.3 12:00 - 12:15 **Automatic Extraction of Micro-Architectural Models of Communication Fabrics from Register Transfer Level Designs** 1413
Sebastiaan J. C. Joosten and Julien Schmaltz

10.7.4 12:15 - 12:30 **GALS Synthesis and Verification for xMAS Models** 1419
Frank Burns, Danil Sokolov and Alex Yakovlev

Session Title	SPECIAL DAY Keynote
Session Code / Room	11.0 / (.)
Date & Time	Thursday, 12 March 2015, 13:15 – 14:00
Chair	Jo De Boeck, *IMEC, BE*
Co-Chair	David Atienza, *École Polytechnique Fédérale de Lausanne (EPFL), CH*

11.0.1(Keynote) 13:15 - 13:20 **Best IP Award Presentation** N/A
Oliver Bringmann

11.0.2(Keynote) 13:20 - 13:50 **Bioelectronic Medicines - Heralding in a New Therapeutic Approach** N/A
Kristoffer Famm

Session Title	**SPECIAL DAY Hot Topic: Implantable Medical Applications**
Session Code / Room	**11.1 / Salle Oisans**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Refet Firat Yazicioglu**, *IMEC, BE*
Co-Chair	**Jean-Paul Linnartz**, *Philips, NL*

11.1.1 14:00 - 14:30 **Active implantable medical devices N/A**
Renzo Dal Molin

11.1.2 14:30 - 15:00 **Towards next generation Deep Brain Stimulation** N/A
Michael Decré

11.1.3 15:00 - 15:30 **Integrated Circuits and Microsystems for Emerging Biomedical Devices N/A**
Minkyu Je

Session Title	**Variability and Robustness for Emerging Technologies**
Session Code / Room	**11.2 / Belle Etoile**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Edith Beigne**, *CEA-LETI, FR*
Co-Chair	**Andy Tyrrell**, *University of York, UK*

11.2.1 14:00 - 14:30 **Variation-Aware, Reliability-Emphasized Design and Optimization of RRAM Using SPICE Model** **1425**
H. Li, Z. Jiang, P. Huang, Y. Wu, H.-Y. Chen, B. Gao, X. Y. Liu, J. F. Kang and H.-S. P. Wong

11.2.2 14:30 - 15:00 **Impact of Process-Variations in STTRAM and Adaptive Boosting for Robustness** 1431
Seyedhamidreza Motaman, Swaroop Ghosh and Nitin Rathi

11.2.3 15:00 - 15:15 **Device/Circuit/Architecture Co-Design of Reliable STT-MRAM 1437**
Zoha Pajouhi, Xuanyao Fong and Kaushik Roy

11.2.4 15:15 - 15:30 **Sub-10 nm FinFETs and Tunnel-FETs: From Devices to Systems 1443**
Ankit Sharma, A. Arun Goud and Kaushik Roy

Session Title	**Hot Topic - Multi/Many-Core Programming: Where Are We Standing?**
Session Code / Room	**11.3 / Stendhal**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Wehn Norbert**, *Technische Universität Kaiserslautern, DE*
Co-Chair	

11.3.1 14:00 - 14:15 **5% or 5X? The Performance Gap in SIMD Optimization, and Possible Solutions[1129] N/A**
Ben Juurlink

11.3.2 14:15 - 14:30 **Model-Based Design of Real-Time Systems [1129] N/A**
Lothar Thiele

11.3.3 14:30 - 14:45 **Programming Adaptive and Energy-Efficient Many-Cores [1129] N/A**
Jeronimo Castrillon

11.3.4 14:45 - 15:00 **Confidence in the Use of Software Tools According to the ISO 26262 in Automotive Multicore Applications [1129]** **N/A**
Ralph Jessenberger

11.3.5 15:00 - 15:15	**Automotive Multicore Microcontroller Simulation, Debugging and Analysis using Virtual Prototypes [1129]** *Victor Reyes*	**N/A**
11.3.6 15:15 - 15:30	**Applying Multicore Compiler Research into Industrial Practices: An Early Experience Report [1129]** *Weihua Sheng*	**N/A**

Session Title	**Logic Synthesis: the Faithful, the Approximate and the Stochastic**
Session Code / Room	**11.4 / Chartreuse**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Alex Yakovlev**, *University of Newcastle, UK*
Co-Chair	**José Monteiro**, *University of Lisbon, PT*

11.4.1 14:00 - 14:30	**A New Approximate Adder with Low Relative Error and Correct Sign Calculation** *Junjun Hu and Weikang Qian*	**1449**
11.4.2 14:30 - 15:00	**Towards Binary Circuit Models That Faithfully Capture Physical Solvability** *Matthias Függer, Robert Najvirt, Thomas Nowak and Ulrich Schmid*	1455
11.4.3 15:00 - 15:15	**A Coupling Area Reduction Technique Applying ODC Shifting** *Yi Diao, Tak-Kei Lam, Xing Wei and Yu-Liang Wu*	**1461**
11.4.4 15:15 - 15:30	**A General Design of Stochastic Circuit and Its Synthesis** *Zheng Zhao and Weikang Qian*	**1467**

Session Title	**Ultra-low Power Devices for Health and Rehabilitation**
Session Code / Room	**11.5 / Meije**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Georgios Karakonstantis**, *Queen's University, UK*
Co-Chair	**José M. Moya**, *Technical University of Madrid, ES*

11.5.1 14:00 - 14:30	**Paper, Pen and Ink: An Innovative System and Software Framework to Assist Writing Rehabilitation** *Leonardo Guardati, Filippo Casamassima, Elisabetta Farella and Luca Benini*	**1473**
11.5.2 14:30 - 15:00	**An All-Digital Spike-Based Ultra-Low-Power IR-UWB Dynamic Average Threshold Crossing Scheme for Muscle Force Wireless Transmission** *Amirhossein, Masoud Shahshahani, Paolo Motto Ros, Alberto Bonanno, Marco Crepaldi, Maurizio Martina, Danilo Demarchi and Guido Masera*	**1479**
11.5.3 15:00 - 15:30	**A Pulsed-Index Technique for Single-Channel, Low-Power, Dynamic Signaling** *Shahzad Muzaffar, Jerald Yoo, Ayman Shabra and Ibrahim (Abe) M. Elfadel*	**1485**

Session Title	**Video Architectures for Multimedia and Communications**
Session Code / Room	**11.6 / Bayard**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Frederic Petro**, *TIMA, FR*
Co-Chair	**Marcello Coppola**, *STMicroelectronics, FR*

11.6.1 14:00 - 14:30	**SAPPHIRE: An Always-on Context-Aware Computer Vision System for Portable Devices** *Swagath Venkataramani, Victor Bahl, Xian-Sheng Hua, Jie Liu, Jin Li, Matthai Phillipose, Bodhi Priyantha and Mohammed Shoaib*	**1491**

11.6.2 14:30 - 15:00 **Approximate Associative Memristive Memory for Energy-Efficient GPUs** **1497**
Abbas Rahimi, Amirali Ghofrani, Kwang-Ting Cheng, Luca Benini and Rajesh K. Gupta

11.6.3 15:00 - 15:15 **Platform-Aware Dynamic Configuration Support for Efficient Text Processing on Heterogeneous System** **1503**
Mi Sun Park, Omesh Tickoo, Vijaykrishnan Narayanan, Mary Jane Irwin and Ravi Iyer

11.6.4 15:15 - 15:30 **A Deblocking Filter Hardware Architecture for the High Efficiency Video Coding Standard** **1509**
Cláudio Machado Diniz, Muhammad Shafique, Felipe Vogel Dalcin, Sergio Bampi and Jörg Henkel

Session Title	**Exploiting Dark Silicon**
Session Code / Room	**11.7 / Les Bans**
Date & Time	**Thursday, 12 March 2015, 14:00 – 15:30**
Chair	**Olivier Heron**, *CEA LIST, FR*
Co-Chair	**Domenik Helms**, *OFFIS, DE*

11.7.1 14:00 - 14:30 **MatEx: Efficient Transient and Peak Temperature Computation for Compact Thermal Models** **1515**
Santiago Pagani, Jian-Jia Chen, Muhammad Shafique, and Jörg Henkel

11.7.2 14:30 - 15:00 **Distributed Reinforcement Learning for Power Limited Many-Core System Performance Optimization** **1521**
Zhuo Chen and Diana Marculescu

11.7.3 15:00 - 15:15 **An Energy-Efficient Virtual Channel Power-Gating Mechanism for On-Chip Networks** **1527**
Amirhossein Mirhosseini, Mohammad Sadrosadati, Ali Fakhrzadehgan, Mehdi Modarressi and Hamid Sarbazi-Azad

11.7.4 15:15 - 15:30 **M-DTM: Migration-based Dynamic Thermal Management for Heterogeneous Mobile Multi-core Processors** **1533**
Young Geun Kim, Minyong Kim, Jae Min Kim and Sung Woo Chu

Session Title	**Interactive Presentations**
Session Code	**IP5**
Date & Time	**Thursday, 12 March 2015, 15:30 – 16:00**

IP5-1 **Towards Systematic Design of 3D pNML Layouts** **1539**
Robert Perricone, Yining Zhu, Katherine M. Sanders, X. Sharon Hu and Michael Niemier

IP5-2 **DESTINY: A Tool for Modeling Emerging 3D NVM and eDRAM caches** **1543**
Matt Poremba, Sparsh Mittal, Dong Li, Jeffrey S. Vetter and Yuan Xie

IP5-3 **Big-Data Streaming Applications Scheduling with Online Learning and Concept Drift Detection** **1547**
Karim Kanoun and Mihaela van der Schaar

IP5-4 **Design Flow and Run-Time Management for Compressed FPGA Configurations** **1551**
Christophe Huriaux, Antoine Courtay and Olivier Sentieys

IP5-5 **Empirical Modelling of FDSOI CMOS Inverter for Signal/Power Integrity Simulation** **1555**
Wael Dghais and Jonathan Rodriguez

IP5-6 **On-Chip Measurement of Bandgap Reference Voltage Using a Small Form Factor VCO Based Zoom-in ADC** **1559**
Osman Emir Erol, Sule Ozev, Chandra Suresh, Rubin Parekhji and Lakshmanan Balasubramanian

IP5-7 **Logical Equivalence Checking of Asynchronous Circuits Using Commercial Tools** **1563**
Arash Saifhashemi, Hsin-Ho Huang, Priyanka Bhalerao and Peter A. Beerel

IP5-8 **May-Happen-in-Parallel Analysis of ESL Models Using UPPAAL Model Checking 1567**
Che-Wei Chang and Rainer Dömer

IP5-9 **Verifying Synchronous Reactive Systems using Lazy Abstraction 1571**
Kumar Madhukar, Mandayam Srivas, Björn Wachter, Daniel Kroening and Ravindra Metta

IP5-10 **SPINTASTIC: Spin-Based Stochastic Logic for Energy-Efficient Computing 1575**
Rangharajan Venkatesan, Swagath Venkataramani, Xuanyao Fong, Kaushik Roy and Anand Raghunathan

IP5-11 **Leakage Power Reduction for Deeply-Scaled FinFET Circuits Operating in Multiple Voltage Regimes Using Fine-Grained Gate-Length Biasing Technique 1579**
Ji Li, Qing Xie, Yanzhi Wang, Shahin Nazarian and Massoud Pedram

IP5-12 **SubHunter: A High-Performance and Scalable Sub-Circuit Recognition Method with Prüfer-Encoding 1583**
Hong-Yan Su, Chih-Hao Hsu and Yih-Lang Li

IP5-13 **Timing Verification for Adaptive Integrated Circuits 1587**
Rohit Kumar, Bing Li, Yiren Shen, Ulf Schlichtmann and Jiang Hu

IP5-14 **A Robust Approach for Process Variation Aware Mask Optimization 1591**
Jian Kuang, Wing-Kai Chow and Evangeline F.Y. Young

IP5-15 **FastTree: A Hardware KD-Tree Construction Acceleration Engine for Real-Time Ray Tracing 1595**
Xingyu Liu, Yangdong Deng, Yufei Ni and Zonghui Li

IP5-16 **Reverse Longstaff-Schwartz American Option Pricing on hybrid CPU/FPGA Systems 1599**
Christian Brugger, Javier Alejandro Varela, Norbert Wehn, Songyin Tang and Ralf Korn

IP5-17 **Accurate Electrothermal Modeling of Thermoelectric Generators 1603**
Mohammad Javad Dousti, Antonio Petraglia and Massoud Pedram

IP5-18 **Efficiency-Driven Design Time Optimization of a Hybrid Energy Storage System with Networked Charge Transfer Interconnnect 1607**
Qing Xie, Younghyun Kim, Donkyu Baek, Yanzhi Wang, Massoud Pedram and Naehyuck Chang

Session Title	**SPECIAL DAY Hot Topic: Technology and Design Platforms for Diagnostics**
Session Code / Room	**12.1 / Salle Oisans**
Date & Time	**Thursday, 12 March 2015, 16:00 – 17:30**
Chair	**Chris Van Hoof**, *IMEC, BE*
Co-Chair	**Minkyu Je**, *Daegu Gyeongbuk Institute of Science and Technology (DGIST), KR*

12.1.1 16:00 - 16:30 **Ultraflexible Integrated Circuits for imperceptible Bio-Sensors N/A**
Tsuyoshi Sekitani

12.1.2 16:30 - 17:00 **Nanoelectronics for disruptive diagnostic platforms N/A**
Liesbet Lagae

12.1.3 17:00 - 17:30 **An Ultra-Low Power Dual-mode ECG Monitor for Healthcare and Wellness 1611**
Daniele Bortolotti, Mauro Mangia, Andrea Bartolini, Riccardo Rovatti, Gianluca Setti and Luca Benini

Session Title	Solver Advances and Emerging Applications
Session Code / Room	12.2 / Belle Etoile
Date & Time	Thursday, 12 March 2015, 16:00 – 17:30
Chair	**Julien Schmaltz**, *Eindhoven University of Technology, NL*
Co-Chair	**Gianpiero Cabodi**, *Politecnico di Torino, IT*

12.2.1 16:00 - 16:30 **Solving DQBF Through Quantifier Elimination** 1617
Karina Gitina, Ralf Wimmer, Sven Reimer, Matthias Sauer, Christoph Scholl and Bernd Becker

12.2.2 16:30 - 17:00 **Formal Verification of Sequential Galois Field Arithmetic Circuits Using Algebraic Geometry** 1623
Xiaojun Sun, Priyank Kalla, Tim Pruss and Florian Enescu

12.2.3 17:00 - 17:15 **A Universal Macro Block Mapping Scheme for Arithmetic Circuits** 1629
Xing Wei, Yi Diao, Tak-Kei Lam and Yu-Liang Wu

12.2.4 17:15 - 17:30 **Towards An Accurate Reliability, Availability and Maintainability Analysis Approach for Satellite Systems Based on Probabilistic Model Checking** 1635
Khaza Anuarul Hoque, Otmane Ait Mohamed and Yvon Savaria

Session Title	Patterning, Pairing, Placement and Packing
Session Code / Room	12.3 / Stendhal
Date & Time	Thursday, 12 March 2015, 16:00 – 17:30
Chair	**Dirk Stroobandt**, *Ghent University, BE*
Co-Chair	**Patrick Groeneveld**, *Synopsys, US*

12.3.1 16:00 - 16:30 **An Effective Triple Patterning Aware Grid-Based Detailed Routing Approach** 1641
Zhiqing Liu, Chuangwen Liu and Evangeline F. Y. Young

12.3.2 16:30 - 17:00 **Simultaneous Transistor Pairing and Placement for CMOS Standard Cells** 1647
Ang Lu, Hsueh-Ju Lu, En-Jang Jang, Yu-Po Lin, Chun-Hsiang Hung, Chun-Chih Chuang and Rung-Bin Lin

12.3.3 17:00 - 17:15 **A TSV Noise-Aware 3-D Placer** 1653
Yu-Min Lee, Chun Chen, JiaXing Song and Kuan-Te Pan

12.3.4 17:15 - 17:30 **Identifying Redundant Inter-Cell Margins and Its Application to Reducing Routing Congestion** 1659
Woohyun Chung, Seongbo Shim and Youngsoo Shin

Session Title	High-Level Specifications and Models
Session Code / Room	12.4 / Chartreuse
Date & Time	Thursday, 12 March 2015, 16:00 – 17:30
Chair	**Marc Geilen**, *TU Eindhoven, NL*
Co-Chair	**Laurence Pierre**, *TIMA Lab, FR*

12.4.1 16:00 - 16:30 **Models for Deterministic Execution of Real-Time Multiprocessor Applications** 1665
Peter Poplavko, Dario Socci, Paraskevas Bourgos, Saddek Bensalem and Marius Bozga

12.4.2 16:30 - 17:00 **Pre-Simulation Symbolic Analysis of Synchronization Issues between Discrete Event and Timed Data Flow Models of Computation** 1671
Liliana Andrade, Torsten Maehne, Alain Vachoux, Cédric Ben Aoun, François Pêcheux and Marie-Minerve Louërat

12.4.3 17:00 - 17 **Formal Consistency Checking over Specifications in Natural Languages** 1677
Rongjie Yan, Chih-Hong Cheng and Yesheng Chai

Session Title	**New Perspectives in Next-Generation Medical Systems**
Session Code / Room	**12.5 / Meije**
Date & Time	**Thursday, 12 March 2015, 16:00 – 17:30**
Chair	**Martin Rajman**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*
Co-Chair	**Giovanni De Micheli**, *École Polytechnique Fédérale de Lausanne (EPFL), CH*

12.5.1 16:00 - 16:30 **Tackling the Bottleneck of Delay Tables in 3D Ultrasound Imaging** 1683
A. Ibrahim, P. Hager, A. Bartolini, F. Angiolini, M. Arditi, L. Benini and G. De Micheli

12.5.2 16:30 - 17:00 **Integrated CMOS Receiver for Wearable Coil Arrays in MRI Applications** 1689
Benjamin Sporrer, Luca Bettini, Christian Vogt, Andreas Mehmann, Jonas Reber, Josip Marjanovic, David O. Brunner, Thomas Burger, Klaas P. Pruessmann, Gerhard Tröster and Qiuting Huang

12.5.3 17:00 - 17:30 **Tactile Prosthetics in WiseSkin** 1695
J. Farserotu, J-D. Decotignie, J. Baborowski, P-N Volpe, C.R. Quirós, V. Kopta, C. Enz, S. Lacour, H. Michaud, R. Martuzzi, V. Koch, H. Huang, T. Li and C. Antfolk

Session Title	**Medical Design Automation: Is All That Simulation and Model Reduction Getting Into Your "Head"?**
Session Code / Room	**12.6 / Bayard**
Date & Time	**Thursday, 12 March 2015, 16:00 – 17:30**
Chair	**Luca Daniel**, *MIT, US*
Co-Chair	**Luis Miguel Silveira**, *INESC-ID, PT*

12.6.1 16:00 - 16:30 ***The Old, the New, and the Recycled – EDA Algorithms in Connectomic*** **N/A**
Lou Scheffer

12.6.2 16:30 - 17:00 **Computational Modeling and Simulation of Synchronized Firing Behaviors of the Brain** **N/A**
Peng Li

12.6.3 17:00 - 17:30 **Electromagnetic Power Deposition Analysis Tool for High Resolution Magnetic Resonance Imaging Brain Scans** **N/A**
Jorge F. Villena, Athanasios G. Polimeridis, Lawrence L. Wald, Elfar Adalsteinsson, Jakob K. White and Luca Daniel

Session Title	**Brain Health and Mental Disorders: new challenges for electronic engineers**
Session Code / Room	**12.7 / Les Bans**
Date & Time	**Thursday, 12 March 2015, 16:00 – 17:30**
Chair	**Pablo Laguna**, *CIBER-BBN, ES*
Co-Chair	**Josep Maria Haro**, *Parc Sanitari Sant Joan de Deu, ES*

12.7.1 16:00 - 16:15 **Towards a quantitative measurement of mental disorders N/A**
Jordi Aguiló

12.7.2 16:15 - 16:40 **Improving the monitoring and the understanding of mental disorders N/A**
Giovanni de Girolamo and Josep Maria Haro

12.7.3 16:40 - 17:05 **World Analysis of non-invasive cardiovascular signals for the monitoring of psychophysiological states N/A**
Michele Orini and Pablo Laguna

12.7.4 17:05 - 17:30 **Healthcare in an Integrated Digital World N/A**
Arben Merkoçi

Additional Papers

The Next Generation of Virtual Prototyping: Ultra-fast yet Accurate Simulation of HW/SW Systems 1698
Oliver Bringmann, Wolfgang Ecker, Andreas Gerstlauer, Ajay Goyal, D. Mueller-Gritschneder, P. Sasidharan, S. Singh

Multi/Many-Core Programming: Where are we Standing? 1708
J. Castrillon, W. Sheng, R. Jessenberger, L. Thiele, L. Schorr, B. Juurlink, M. Alvarez-Mesa, A. Pohl, V. Reyes, R. Leupers

Memristor Based Computation-in-Memory Architecture for Data-Intensive Applications 1718
S. Hamdioui, L. Xie, h. Anh Du Nguyen, M. Taouil, K. Bertels, H. Corporaal, h. Jiao, F. Catthoor, D. Wouters, L. Eike, J. Van Lunteren

Panel: The Future of Electronics, Semiconductors, and Design In Europe 1726
M. Cassale-Rossi, G. De Micheli, J. Baherli, A. Domic, H. Symanzik, B. Sensortec, H. Yassaie