

Technical Program

Tuesday March 21st, 2023 (Student Activities)

09:00 – 10:30 Tutorial “Neuromorphic Computing: Challenges and Solutions for Design and Test – Part 1”

Leticia Maria Bolzani Poehls, RWTH Aachen University – Germany

Jan Moritz Joseph, RWTH Aachen University – Germany

10:30 – 11:00 Coffee-Break

11:00 – 12:30 Tutorial “Neuromorphic Computing: Challenges and Solutions for Design and Test – Part 2”

Leticia Maria Bolzani Poehls, RWTH Aachen University – Germany

Jan Moritz Joseph, RWTH Aachen University – Germany

12:30 – 14:00 Lunch

14:00 – 15:00 Tutorial “Assessing the ANN reliability: Issues, Strategies and Opportunities”

Ernesto Sanchez, Politecnico di Torino – Italy

15:00 – 15:30 Coffee-Break

15:30 – 16:30 McCluskey PhD Contest

Technical Program

Wednesday March 22nd, 2023

08:30 – 09:00 LATS2023 Opening Session

LATS2023 General Co-Chairs

Victor Champac, INAOE - Mexico

Yervant Zorian, Synopsys, USA

LATS2023 Program Co-Chairs

Leticia Maria Bolzani Poehls, RWTH Aachen University - Germany

Ernesto Sanchez, Politecnico di Torino - Italy

09:00 – 09:35 Keynote Talk “Test Aspects of System Health State Monitoring”

Hans-Joachim Wunderlich, Consultant - Germany

Session Chair: Victor Champac, INAOE – Mexico

09:35 – 10:35 Session 1 “Fault Injection Strategies for Reliability Analysis”

Session Chair: Salvador Mir, TIMA – France

A Fast Reliability Analysis of Image Segmentation Neural Networks Exploiting Statistical Fault Injections

Gabriele Gavarini, Annachiara Ruospo and **Ernesto Sanchez**

Politecnico di Torino - Italy

Fast analysis of combinatorial netlists correctness rate based on binomial law and partitioning **Esther Goudet**^{1,2}, Luis Pena Trevino², Lirida Naviner¹, Jean-Marc Daveau² and Philippe Roche¹

¹STMicroelectronics – France

²Télécom Paris – France

A Fault Injection Framework for AI Hardware Accelerators

Salvatore Pappalardo¹, Annachiara Ruospo², Ian O’Connor¹, Bastien Deveautour³, Ernesto Sanchez², Alberto Bosio¹

^{1,3} University Lyon, ECL, INSA Lyon, CNRS, UCBL, CPE Lyon, INL, UMR5270, 69130 Ecully - France

²Politecnico di Torino– Italy

10:35 – 11:00 Coffee-Break

11:00 – 11:40 Session 2 “Security and Reliability Assessment Using IJTAG”

Session Chair: Erik Larson, Lund University – Sweden (tbc)

SSSN: Secured Streaming Scan Network

Sonali Shukla, **Bhavika Ranjeet Kumar** and Virendra Singh

ITT Bombay – India

Holistic IJTAG-based External and Internal Fault Monitoring in UAVs

Faisal Ahmed and Maksim Jenihhin

Tallinn University of Technology – Estonia

11:40 – 12:10 Embedded Tutorial “Co-optimization of security and accessibility to on-chip instruments”

Erik Larsson, Lund University – Sweden

Session Chair: Maksim Jenihhin, Tallinn University of Technology - Estonia

12:10 – 14:00 Lunch

14:00 – 14:30 Keynote Talk “A New Era for Test: From the Manufacturing Floor to the Field”

Shawn Blanton, Carnegie Mellon University – USA

Session Chair: Hans-Joachim Wunderlich, Consult – Germany (tbc)

14:30 – 15:30 Special Session “AMS-RS Testing”

Organized by Florence Azaïs, LIRMM – France

High-frequency Sinusoidal Signal Generation using harmonic cancellation

Ankush Mamgain¹, Salvador Mir¹, Jai Narayan Tripathi², Manuel J. Barragan¹

¹University Grenoble Alpes, CNRS, Grenoble INP, TIMA - France

²Indian Institute of Technology Jodhpur - India

Low-cost digital solution for production test of ZigBee transmitters

Thibault Vayssade, **Florence Azaïs**, Laurent Latorre, François Lefèvre

LIRMM, University Montpellier / CNRS – France

NXP Semiconductors - France

On-chip self-referenced jitter estimation with sub-picosecond resolution

Manasa Madhvaraj, **Salvador Mir**, Manuel J. Barragan

University Grenoble Alpes, CNRS, Grenoble INP, TIMA - France

15:30 – 16:00 Embedded Tutorial “Functional Testing techniques: a short overview encompassing Software-Based Self-Test, Burn-In Functional Stress/Test and System-Level Test”

Paolo Bernardi, Politecnico di Torino – Italy

Session Chair: Shawn Blanton, Carnegie Mellon University – USA (tbc)

16:00 – 16:15 Coffee-break

16:15 – 16:45 Keynote Talk “Error Resilient Neuromorphic Systems Using Embedded Predictive Neuron Checks”

Abhijit Chatterjee, Georgia Institute of Technology – USA

Session Chair: Ernesto Sanchez, Politecnico di Torino – Italy

16:45 – 17:30 Invited Papers, Posters & Late Contributions

Session Chair: Leticia Maria Bolzani Poehls, RWTH Aachen University - Germany

16:45 – 17:05 (Invited Paper) X-FLIM: A Holistic Fault Injection Platform for Neuromorphic Hardware

Felix Staudigl¹, Thorben Fetz¹, Rebecca Pelke¹, Dominik Sisejkovic³, **Jan Moritz Joseph¹**, Leticia Maria Bolzani Poehls², Rainer Leupers¹

¹ICE, RWTH Aachen University, Germany

²IDS, RWTH Aachen University, Germany

³Corporate Research Robert Bosch GmbH, Germany

17:05 – 17:15 (Late Contribution) Low cost external serial interface watchdog for SoCs and FPGAs automatic characterization tests

Paolo Bernardi, Gabriele Filipponi, Tommaso Foscale and Giorgio Insinga
Politecnico di Torino, Italy

17:15 – 17:25 (Late Contribution) Near-infrared spectroscopy for real-time imaging of human brain function

P. Mabil Espinosa, J. Martinez-Castillo, S. Salas Rodriguez, E. Delgado Alvarado and M. Herrera González

Universidad Veracruzana, Mexico

17:25 – 17:35 (Poster) LUT-based Arithmetic Circuit Approximation with Formal Guarantee on Worst Case Relative Error

Pooja Choudhary^{1,2}, Lava Bhargava², Masahiro Fujita³ and Virendra Singh⁴

¹Malaviya National Institute of Technology - India

²Swami Keshvanand Institute of Technology, Management and Gramothan - India

³University of Tokyo - Japan

⁴ITT Bombay – India

17:35 – 17:45 (Poster) Blockchain Applied in Decentralization of Ground Stations to mission of Nanosatellites

Jose Edilson Silva Filho, **Jarbas Aryel Nunes da Silveira** and Cesar Augusto Missio Marcon
University of Ceará, Brazil

From 19:00 Welcome Cocktail

Thursday March 23rd, 2023

08:30 – 09:00 Keynote Talk “Silicon Lifecycle Management: Trends & Solutions”

Yervant Zorian, Synposys – USA

Session Chair: Adit Singh, Auburn Univeristy – USA (invited)

09:30 – 19:00 Social Event

From 20:00 Gala Dinner

Friday March 24th, 2023

09:00 – 09:30 Embedded Tutorial “Silent Error Corruption: The New Reliability and Test Challenge”

Adit Singh, Auburn University – USA

Session Chair: Yervant Zorian, Synopsys – USA (invited)

09:30 – 10:30 Session 3 “Transient Faults and Fault Tolerance”

Session Chair: Hector Villacorta, Semtech – Mexico

Effect of V_{th} shifting in CMOS Transistors under radiation conditions when applying OBT: A case study

Pablo Antonio Petrashin¹, Walter Lancioni¹, Fortunato Dualibe², Juan Castagnola¹ and Agustin Laprovitta¹

¹Universidad Católica de Córdoba - Argentina

²Faculté polytechnique de Mons – Belgium

Fault Tolerant architecture design of a CubeSat Command and Data Handling system

Christo A. Lara¹, Maximiliano Fragoso¹, Luis Manuel Juárez¹, Leonardo Barboni², Rigoberto Reyes³, Ricardo Vazquez³, Julio Pérez Aclé² and Saúl de la Rosa¹

¹UNAM – Mexico

²Facultad de Ingeniería, Udelar - Uruguay

³Agencia Espacial Mexicana – Mexico

Analyzing the Architectural Impact of Transient Fault Effects in SFUs of GPUs

Josie Esteban Rodríguez Condiá¹, Juan David Guerrero Balaguera¹, Edwar J. Patino Nunez², Robert Limas Sierra¹ and Matteo Sonza Reorda¹

¹Politecnico di Torino – Italy

²UPTC – Colombia

10:30 – 11:00 Visionary Talk “Rethinking Computing with Neuro-inspired Learning: Algorithms to Hardware”

Kaushik Roy, Purdue University – USA

Session Chair: Abhijit Chatterjee, Georgia Institute of Technology – USA

11:00 – 11:15 Coffee-break

11:15 – 11:45 Invited Talk “Analyzing Side-Channel Attack Vulnerabilities at RTL”

Maksim Jenihhin, Tallinn University of Technology, Estonia

Session Chair: Paolo Bernardi, Politecnico di Torino – Italy

11:45 – 12:30 Panel “Silent Data Corruption: Challenges and Solutions”

Organized by Yervant Zorian, Synopsys – USA

12:30 – 14:30 Lunch

14:30 – 15:00 Invited Talk “Testing for Smart Production Lines”

Franco Fummi, University of Verona - Italy
Session Chair: TBD

15:00 – 15:40 Session 4 “Defect and Fault Modeling”

Session Chair: Thiago Santos Copetti, RWTH Aachen University - Germany

A New Defect Model due to a Dust Particle Affecting the Fingers of FinFET Logic Gates Make with SADP and Gate Replacement Process

Victor Champac¹, Freddy Forero¹, Michel Renovell Renovell² and **Leonardo Miceli**¹

¹INAOE – Mexico

²LIRMM – France

Abstractions for Modeling the Effects of Wall Surface Roughness in Silicon Photonic Microring Resonators

Pratishtha Agnihotri, Lawrence Schlitt, Priyank Kalla and Steve Blair
University of Utah – USA

15:40 – 16:00 Coffee-Break

16:00 – 17:00 Session 5 “Test Strategies”

Session Chair: Gustavo Rifka, Mexico (invited)

On the integration and hardening of Software Test Libraries in Real-Time Operating Systems

Francesco Angione², Paolo Bernardi², Riccardo Cantoro², Nicola di Gruttola Giardino², Davide Piumatti², Matteo Sonza Reorda², Davide Appello¹ and Vincenzo Tancorre¹

¹ST Microelectronics – Italy

²Politecnico di Torino - Italy

Feature selection for cost reduction in MCU performance screening

Nicolò Bellarmino¹, Riccardo Cantoro¹, Martin Huch², Tobias Kilian^{2,3}, Ulf Schlichtmann² and Giovanni Squillero¹

¹Politecnico di Torino – Italy

²Infineon Technologies AG – Germany

³Technical University of Munich – Germany

Evaluating a New RRAM Manufacturing Test Strategy

Thiago Santos Copetti¹, Andrea Castelnuovo², Tobias Gemmeke¹, Leticia Bolzani Poehls¹

¹RWTH Aachen University – Germany

²NXP Semiconductors – Germany

17:00 – 17:30 LATS2023 Closing Session