

Tuesday 24th May 2022

09:00 - 09:30 (CEST) Opening/Awards

09:30 - 10:30 (CEST) **Keynote Address 1** (Room MAGNA)

Supercomputers and European Sovereignty ...

Dr. Mateo Valero Cortés

Director, Barcelona Supercomputing Center, Spain

10:30 - 11:15 (CEST) Coffee Break

11:15 - 12:45 (CEST) **Session 1: Embedded Test and Infrastructure IP** (Room A)

Session Chair: Zebo Peng, Linkoping University, Sweden

11:15 - 11:45 *X-Masking for In-System Deterministic Test* [regular]

(Best Paper Award Candidate)

Jerzy TYSZER¹, Grzegorz MRUGALSKI², Janusz RAJSKI², Bartosz WLODARCZAK¹

¹Poznan University of Technology, Poland

²Siemens Digital Industries Software, Wilsonville, USA

11:45 - 12:15 *Reducing Routing Overhead by Self-Enabling Functional Path Ring Oscillators* [regular]

(Best Paper Award Candidate)

Tobias KILIAN^{1,2}, Markus HANEL^{1,2}, Daniel TILLE¹, Martin HUCH¹, Ulf SCHLICHTMANN²

¹Infineon Technologies, Neubiberg, Germany

²Technical University of Munich, Germany

12:15 - 12:45 *Research on Path Delay with BTI Recovery Effect* [case-study]

Jiebing WU, Yongsheng SUN, Yukai LIN, Yuan WANG, Mingna FAN, Junlin HUANG

Hisilicon Technologies Co. Ltd, Shenzhen, China

11:15 - 12:45 (CEST) **Session 2: Security and Trust** (Room MAGNA)

Session Chair: Haralampos Stratigopoulos, Sorbonne University/LIP6, France

11:15 - 11:45 *Evaluating Security of New Locking SIB-based Architectures* [regular]

Yogendra SAO¹, Anjum RIAZ², Satyadev AHLAWAT², Sk. Subidh ALI¹

¹Indian Institute of Technology Bhilai, India

²Indian Institute of Technology Jammu, India

11:45 - 12:15 *TaintLock: Preventing IP Theft through Lightweight Dynamic Scan Encryption using Taint bits* [regular]

Jonti TALUKDAR, Arjun CHAUDHURI, Krishnendu CHAKRABARTY

Duke University, USA

12:15 - 12:45 *A Lightweight, Plug-and-Play and Autonomous JTAG Authentication IP for Secure Device Testing* [case-study]

Sebastien LAPEYRE¹, Nicolas VALETTE¹, Marc MERANDAT¹, Marie-Lise FLOTTES², Bruno ROUZEYRE², Arnaud VIRAZEL²,

¹INVIA, Meyreuil, France

²University of Montpellier/CNRS/LIRMM, France

11:15 - 12:45 (CEST) **Vendor Session 1** (Room B)

Session Chair: Stephan Eggersgluess, Siemens EDA, Germany

11:15 - 11:45 *Improving Test Quality and Reliability via In-system/In-field Testing*

Lee HARRISON

SIEMENS EDA, Cambridge, United Kingdom

11:45 - 12:15 *How ACS enables an Open Innovation Ecosystem for AI/ML applications in the Semiconductor Value Chain*

Matthias SAUER, Sonny BANWARI
ADVANTEST, Boeblingen, Germany

12:15 - 12:45 *The Need for New DFT Approaches to Scan*

Thomas KOEHLER
TERADYNE, Munich, Germany

12:45 - 14:00 (CEST) Lunch

14:00 - 15:00 (CEST) **Session 3: Functional Safety** (Room A)

Session Chair: Paolo Bernardi, Politecnico di Torino, Italy

14:00 - 14:30 *A Data-driven Approach for Fault Detection in the Alternator Unit of Automotive Systems* [case-study]

Mehdi TAHOORI¹, Arunkumar VIJAYAN¹, Ewald KINTZLI², Timm LOHMANN², Juergen Hans HANDL²

¹Karlsruhe Institute of Technology, Germany

²SEG Automotive, Stuttgart, Germany

14:30 - 15:00 *On Extracting Reliability Information from Speed Binning* [hot-topic]

Zahra NAJAFI HAGHI, Florian KLEMME, Hussam AMROUCH, Hans-Joachim WUNDERLICH
University of Stuttgart, Germany

14:00 - 15:00 (CEST) **Embedded Tutorial Session 1** (Room MAGNA)

IEEE P2427 - Analog defect Simulation in the industry of tomorrow

Organizer: Anthony COYETTE (Onsemi, Belgium)

Session Chair: Hans Martin von Staudt, Dialog, Germany

14:00 - 14:20 *A General Introduction: Scope, Purpose and Status*

Anthony COYETTE
Onsemi, Belgium

14:20 - 14:40 *Defect Classification and Defect Coverage Reporting*

Jo GUNNES
NXP, The Netherlands

14:40 - 15:00 *Analog Defect Simulation Applications on Digital and Alternate Tests*

Devanathan VARADARAJAN
Texas Instruments, USA

14:00 - 15:00 (CEST) **Poster Session 1** (5 minutes per paper) (Room B)

Session Chair: Giorgio di Natale, CNRS/Univ. Grenoble Alpes/TIMA, France

A Generic Fast and Low Cost BIST Solution for CMOS Image Sensors

Julia LEFEVRE^{1,2}, Philippe DEBAUD², Patrick GIRARD², ARNAUD VIRAZEL²

¹STMicroelectronics, Grenoble, France

²University of Montpellier/CNRS/LIRMM, France

FPGA Design Deobfuscation by Iterative LUT Modifications at Bitstream Level

Michail MORAITIS, Elena DUBROVA
Royal Institute of Technology, Stockholm, Sweden

Quality Assessment of RFET-based Logic Locking Protection Mechanisms using Formal Methods

Marcel MERTEN, Sebastian HUHN, Rolf DRECHSLER
University of Bremen, Germany

RRAM Crossbar-Based Fault-Tolerant Binary Neural Networks (BNNs)
Anteneh GEBREGIORGIS, Artemis ZOGRAFOU, Said HAMDIOUI
Delft University of Technology, The Netherlands

Detection of Malicious FPGA Bitstreams using CNN-Based Learning
Jayeeta CHAUDHURI, Krishnendu CHAKRABARTY
Duke University, USA

Hierarchical Memory Diagnosis
Guilherme CARDOSO MEDEIROS¹, Moritz FIEBACK¹, Anteneh GEBREGIORGIS¹, Mottaqiallah TAOUIL¹,
Leticia Bolzani POEHLS², Said HAMDIOUI¹
¹Delft University of Technology, The Netherlands
²IDS, RWTH Aachen, Germany

Novel Design For Test (DFT) Concept to Check the Spectral Mask Compliance Defined in the IEEE Std.
802.15.6-2012 of Wireless-Body-Area-Network (WBAN) IC-Devices
Alexander OLESZCZUK^{1,2}, Mohamed THOUBATIA¹, Martin ALLINGER¹, Jurgen Rober¹, Robert Weigel²
¹eesy-IC GmbH, Erlangen, Germany
²Friedrich-Alexander University, Erlangen, Germany

Graph Theory Approach for Multi-site ATE Board Parameter Extraction
Abraham STEENHOEK¹, Praise FARAYOLA¹, Isaac BRUCE¹, Shravan CHAGANTI², Abal Hassan SHEIKH²,
Srivaths RAVI², Degang CHEN
¹Iowa State University, Ames, USA
²Texas Instruments, USA

Prediction of Thermally Accelerated Aging Process at 28 nm
Parvez CHANAWALA, Ian HILL, Seyed Arash SHEIKHOLESLAM (UBC), Andre IVANOV
University of British Columbia, Vancouver, Canada

15:00 - 16:00 (CEST) Coffee Break & **Poster Session 1**

16:00 - 17:30 (CEST) **Session 4: Safety of Circuits and Systems** (Room A)
Session Chair: Stefano DI CARLO, Politecnico di Torino, Italy

16:00 - 16:30 *Machine learning based soft error rate estimation of pass transistor logic in high-speed communication* [case-study]
Zhe ZHANG¹, Jan LAPPAS², Andre CHINAZZO², Christian WEIS², Zhihang WU³, Leibin NI³, Mehdi TAHOORI¹, Norbert WEHN²
¹Karlsruhe Institute of Technology, Germany
²Technical University Kaiserslautern, Germany
³Huawei Technologies Co. Ltd., Shenzhen, China

16:30 - 17:00 *Super Acceleration of Dilithium in MPSoC Critical Environments* [case-study]
Johanna SEPULVEDA^{1,2}, Dominik WINKLER²
¹Airbus Defence and Space, Germany
²Technical University Munich, Germany

17:00 - 17:30 *Real-Time Control-Flow Integrity for Multicore Mixed-Criticality IoT Systems* [hot-topic]
Vahid EFTEKHARI, Paolo PRINETTO, Gianluca ROASCIO
Politecnico di Torino, Italy

16:00 - 17:30 (CEST) **Special Session 1** (Room MAGNA)

RF 5G Test

Organizer/Session Chair: William EISENSTADT (Univ. Florida, USA)

16:00 - 16:30 *Addressing the Challenges of 5G Production Test*
Mark Roos, CEO and Devin Morris, Senior RF Applications Engineer
Roos Instruments, Inc., Santa Clara, USA

16:30 - 17:00 *RF and mmW test activities at CEA-Leti*
José Luis González-Jiménez and Christopher MOUNET
UGA/CEA-Leti, Grenoble, France

17:00 - 17:15 *Feature selection techniques for indirect test and statistical calibration of mm-wave integrated circuits*
Manuel J. Barragan¹, Gildas Leger², Florent Cilici³, Estelle Lauga-Larroze¹, Salvador Mir¹, Sylvain Bourdel¹
¹UGA/G-INP/CNRS/TIMA, Grenoble, France
²IMSE-CNM, CSIC, Universidad de Sevilla, Sevilla, Spain
³NXP, Toulouse, France

17:15 - 17:30 *Integrated Characterization Solutions for ICs and Devices Beyond 100 GHz*
M. Margalef-Rovira¹, I. Alaji¹, H. Ghanem¹, G. Ducournau¹, and C. Gaquiere²
¹Univ. Lille, CNRS, Centrale Lille, Yncrea Lille, Univ. Polytechnique Hauts-de-France, Lille, France
²MC2-Technologies, 59493 Villeneuve-d'Ascq, France

16:00 - 17:30 (CEST) **Industry Case-Study Presentations Session 1** (Room B)

Session Chair: Wim Dobbelaere, ON Semiconductor, Belgium
Session Co-Chair: Davide Appello, STMicroelectronics, Italy

16:00 - 16:20 *Strategies for Enabling Quantum Development with Test and Measurement at millikelvin range focussing on pre-characterization*
Jack DEGRAVE¹, Philip KRANTZ², Dong-Thuc KNOBBE¹
¹FormFactor, USA
²Keysight, USA

16:20 - 16:40 *Challenges and Solutions for Automotive Cold Test Elimination*
Chen HE
NXP Semiconductors, USA

16:40 - 17:00 *RETE: DfRT, Test for Reliability & Data Analysis for zero defects and zero scraps*
Mauro PIPPONZI, Alessandro MASERI, Luca MORICONI
ELES Semiconductor Equipment, Italy

17:00 - 17:20 *3D interconnect Test Challenge*
Sreejit CHAKRAVARTY
Intel, USA

17:30 - 19:00 (CEST) **Panel Session 1 (with wine & cheese)** (Room MAGNA)

I wish IJTAG would do this ...

Organizer: Michele PORTOLAN (Univ. Grenoble Alpes/G-INP/TIMA, France), Jeff REARICK (AMD, USA),
Martin KEIM (Siemens EDA, USA)

Moderator: Hans Martin von STAUDT, Dialog, Germany

Participants:

Michele PORTOLAN (Univ. Grenoble Alpes/G-INP/TIMA, France)
Jean-François COTE (Siemens EDA, USA),
Tom WAAYERS, NXP, The Netherlands
Jeff REARICK (AMD, USA)

Wednesday 25th May 2022

08:30 - 09:30 (CEST) **Keynote Address 2** (Room MAGNA)

AI-Assisted Yield Learning

Dr. Yu Huang

EDA Chief Architect, HiSilicon Technologies Co. Ltd, China

09:30 - 10:30 (CEST) **Poster Session 2** (5 minutes per paper) (Room A)

Session Chair: Maria Michael, University of Cyprus, Cyprus

Trojan Insertions of Fully Programmable Valve Arrays

Nadun SINHABAHU¹, Jian-De LI², Katherine Shu-Min LI¹, Syng-Jyan WANG², Tsung-Yi HO³

¹National Sun Yat-Sen University, Taiwan

²National Chung-Hsing University, Taiwan

³National Tsing Hua University, Taiwan

Smart Redundancy Schemes for ANNs against Fault Attacks

Troya KÖYLÜ, Said HAMDIOUI, Mottaqiallah TAOUIL

Delft University of Technology, The Netherlands

A Novel Collaborative SSD Test Case Clustering Method Associating I/O Workload and Function Coverage

Gyohun JEONG, Sangmin KIM, Hyelyun KIM, Sunghye LEE

Samsung Electronics, Hwaseong, Republic of Korea

Novel Method to Measure Common Mode Transient Immunity of Isolators

Mohamed THOUABTIA, Alexander OLESZCZUK, Thomas GIRG, Martin ALLINGER

eesy-IC GmbH, Erlangen, Germany

On-Chip training of Crosstalk Predictors to Fit Uncertainties

Rezar SADEGHI, Ehsan AKBARI, Mohamad Ali SABER

University of Tehran, Iran

On-Line Reliability Estimation of Ring Oscillator PUFs

Sergio VINAGRERO GUTIERREZ, Giorgio DI NATALE, Elena Ioana VATAJELU

UGA/CNRS/G-INP/TIMA, Grenoble, France

Concurrent Error Detection for LSTM Accelerators

Nooshin NOSRATI, Seyedeh Maryam GHASEMI, Mahboobe SADEGHIPOUR ROODSARI, Zainalabedin NAVABI

University of Tehran, Iran

Process and Runtime Variation Robustness for Spintronic-Based Neuromorphic Fabric

Soyed Tuhin AHMED, Hefenbrock MICHAEL, Mahta MAYAHINIA, Christopher MÜNCH, Mehdi TAHOORI

Karlsruhe Institute of Technology, Germany

Effective techniques for automatically improving the transition delay fault coverage of Self-Test Libraries

Sandro SARTONI¹, Riccardo CANTORO¹, Francesco GARAU¹, Patrick GIRARD², Nima KOLAHIMAHMOUDI¹, Matteo SONZA REORDA¹, ARNAUD VIRAZEL²

¹Politecnico di Torino, Italy

²University of Montpellier/CNRS/LIRMM, France

09:30 - 10:30 (CEST) **Special Session 2** (Room MAGNA)

Test, Reliability and Functional Safety trends for Automotive System-on-Chip

Organizer/Session Chair: Paolo Bernardi, Politecnico di Torino (Italy)

09:30 - 09:50 *Self-mitigation properties on Image segmentation Neural Networks*

R. Mariani, A. Ruospo, G. Gavarini, C. De Sio, L. Sterpone, M. Sonza, J. Aribido, E. Sanchez
Nvidia (USA), Politecnico di Torino (Italy)

09:50 - 10:10 *A Machine Learning Framework to catch Inter-Wafer Process Variations in Microcontrollers Performance Prediction*

M. Huch, N. Bellarmino, R. Cantoro, Tobias Kilian, R. Martone, U. Schlichtmann, G. Squillero
Infineon Technologies (Germany), Politecnico di Torino (Italy)

10:10 - 10:30 *A System-level Test and Burn-In oriented Test Equipment*

F. Angione, D. Appello, P. Bernardi, T. Foscale, G. Iaria, V. Tancorre, R. Ugioli
STMicroelectronics (Italy), Politecnico di Torino (Italy)

09:30 - 10:30 (CEST) **Industry Case-Study Presentations Session 2** (Room B)

Session Chair: Davide Appello, STMicroelectronics, Italy

Session Co-Chairs: Wim Dobbelaere, ON Semiconductor, Belgium

Georges Gielen, KU Leuven, Belgium

09:30 - 09:50 *Evaluating Burn-In related Metrics for large Automotive Systems-on-Chip*

Francesco ANGIONE¹, Paolo BERNARDI¹, Andrea CALABRESE¹, Stefano QUER¹, Davide APPELLO²,
Vincenzo TANCORRE², Roberto UGIOLI²

¹ Politecnico di Torino, Italy

² STMicroelectronics, Italy

09:50 - 10:10 *MBSA Approaches Applied to Next Decade Digital Components*

Tiziano FIORUCCI¹, Jean-Marc DAVEAU¹, Emmanuel ARBARETIER², Giorgio DI NATALE³, Philippe ROCHE¹,
Thomas JACQUET²

¹ STMicroelectronics, Crolles, France

² APSYS-AIRBUS, France

³ Univ. Grenoble Alpes/CNRS/TIMA, France

10:10 - 10:30 *Monitoring and controlling handler temperature*

Guy DECABOOTER

Onsemi, Belgium

10:30 - 11:15 (CEST) Coffee Break & **Poster Session 2**

11:15 - 12:45 (CEST) **Panel Session 2** (Room MAGNA)

Can DPPM of AMS circuits be accurately estimated from their defect coverage?

Organizer/Moderator: Vladimir ZIVKOVIC (Infineon Technologies, Denmark)

Participants:

Mayukh BHATTACHARYA (Synopsys, USA),

Dieter DRAXELMAYR (Infineon Technologies, Austria),

Bram KRUSEMAN (NXP Semiconductors, The Netherlands),

Stephen SUNTER (Siemens EDA, Canada),

Haralampos STRATIGOPOULOS (Sorbonne University/LIP6, France)

12:45 - 14:00 (CEST) Lunch

14:00 - 15:00 (CEST) **Session 5: Validation and verification** (Room A)

Session Chair: Virendra Singh, Indian Institute of Technology, Bombay

Ilia Polian, University of Stuttgart, Germany

14:00 - 14:30 *Enabling Coverage-Based Verification in Chisel* [regular]

Andrew DOBIS, Hans Jakob DAMSGAARD, Enrico TOLOTTO, Kasper HESSE, Tjark PETERSEN, Martin
SCHOEBERL

Technical University of Denmark, Lyngby, Denmark

14:30 - 15:00 *SpinalFuzz: Coverage-Guided Fuzzing for SpinalHDL Designs* [case-study]
Katharina RUEP, Daniel GROSSE
Johannes Kepler University, Linz, Austria

14:00 - 15:00 (CEST) **Embedded Tutorial Session 2** (Room MAGNA)

Power Aware Test

Organizer: Likith Kumar MANCHUKONDA, Synopsys Inc., USA
Session Chair: Bram Kruseman, NXP, The Netherlands

14:00 - 14:20 *Memory and Scan Test Implementation*
Likith Kumar MANCHUKONDA
Synopsys Inc., USA

14:20 - 14:40 *Scan Synthesis, Placement and Routing*
Karthikeyan NATARAJAN
Synopsys Inc, USA

14:40 - 15:00 *Automatic Pattern Generation*
Manish ARORA
Synopsys Inc, USA

14:00 - 15:00 (CEST) **PhD Forum Session** (3 minutes per paper) (Room B)

Session Chair: Ernesto Sánchez, Politecnico di Torino, Italy
Session Co-chair: Liviu Miclea, Technical University of Cluj-Napoca, Romania

A Pipelined AUTOSAR Communication ASIP

Ahmed HAMED^{1,2}, Watheq EL-KHARASHI^{1,3}, Ashraf SALEM^{1,2}, Mona SAFAR¹

¹Ain Shams University, Cairo, Egypt

²Siemens Digital Industries Software, Cairo, Egypt

³University of Victoria, Canada

A Platform for Structural Analysis of Logic Locking Using Machine Learning

Prabuddha CHAKRABORTY¹, Jonathan CRUZ¹, Abdulrahman ALAQL^{1,2}, Swarup BHUNIA¹

¹University of Florida, USA

²KACST, Saudi Arabia

Analysis and Simulation of Logic-In-Memory Operations

Pietro INGLESE, Elena Ioana VATAJEL, Giorgio DI NATALE (UGA/CNRS/G-INP/TIMA, Grenoble, France)

Control Flow Error Detection Techniques Assessment for Embedded Software Development and Validation

Mohammadreza AMEL SOLOUKI, Jacopo SINI, Massimo VIOLANTE (Politecnico di Torino, Italy)

Defect Analysis of a Spintronic Synapse for Spiking Neural Networks

Salah DADDINOUNOU, Elena Ioana VATAJELU (UGA/CNRS/G-INP/TIMA, Grenoble, France)

DNN Hardware Reliability Assessment and Enhancement

Mahdi TAHERI, Maksim JENIHHIN, Masoud DANESHTALAB (Tallin University of Technology, Estonia)

Embedded memory testing: from power measurements to defect analysis

Giorgio INSINGA, Paolo BERNARDI, Riccardo CANTORO (Politecnico di Torino, Italy)

Improving the Design for Testability of Integrated Circuits Using Formal Methods and AI Techniques

Payam HABIBY (University of Bremen, Germany)

Manufacturing Testing and Functional Safety techniques for Automotive SoCs

Francesco ANGIONE, Paolo BERNARDI, Riccardo CANTORO (Politecnico di Torino, Italy)

Memristor-based Security Primitives

Sergio VINAGRERO GUTIERREZ, Elena Ioana VATAJELU, Giorgio DI NATALE (UGA/CNRS/G-INP/TIMA, Grenoble, France)

New Solutions for Generating Functional Sequences Maximizing the Sustained Switching Activity of Complex SoCs

Nikolaos DELIGIANNIS (Politecnico di Torino)

New techniques to detect and mitigate aging effects in advanced semiconductor technologies

Sandro SARTONI (Politecnico di Torino, Italy)

Qualification methodology for ISO26262 certification of automotive SoC systems

Tiziano FIORUCCI^{1,2}, Giorgio DI NATALE²

¹STMicroelectronics

²UGA/CNRS/G-INP/TIMA, Grenoble, France

Reliability Assessment of Neural Networks in GPUs

Juan GUERRERO (Politecnico di Torino, Italy)

Resiliency to Soft-Errors for Embedded Processors Using ML-based Checkers

Nooshin NOSRATI¹, Zainalabedin NAVABI¹, Maksim JENIHHIN²

¹University of Tehran, Iran

²Tallin University of Technology, Estonia

Strategies and Evaluation Methods to reach Ultra-Reliability in Automotive Systems-on-Chip

Giusy IARIA, Paolo BERNARDI (Politecnico Di Torino, Italy)

Tools for the Analysis of Simulation Dumps and the Evaluation of Burn-in Techniques

Andrea CALABRESE, Giovanni SQUILLERO, Stefano QUER (Politecnico di Torino, Italy)

Using ML for Back-Annotating Low-Level Effects in a System-Level Framework

Katayoon BASHARKHAH, Zainalabedin NAVABI (University of Tehran, Iran)

15:00 - 16:00 (CEST) **Keynote Address 3** (Room MAGNA)

DFX: Exploring the Design Space for Quality

Kaushik Narayanun

Vice-president Engineering, NVIDIA, USA

16:00 - 17:00 (CEST) Coffee Break & PhD Forum Posters

17:00 - 22:00 Social Event & Gala dinner

Thursday 26th May 2022

08:30 - 09:30 (CEST) **Keynote Address 4** (Room MAGNA)

SiGe BiCMOS Technology with Advanced Integration Solutions for mm-Wave and THz Applications

Dr.-Ing. Mehmet Kaynak

Leibniz Institute for High Performance Microelectronics (IHP), Germany

09:30 - 10:30 (CEST) **Session 6: Analog/Mixed-Signal and RF Test** (Room A)

Session Chair: Jordi Madrenas, UPC, Barcelona, Spain

9:30 - 10:00 *WLAN Rx PER Test Implementation in ATE* [case-study]

Alban Haynse IMMANUEL, Jey NITHYANANDAM

Infineon Technologies, Bangalore, India

10:00 - 10:30 *AMS Test Vector Generation using AMS Verification and IEEE P1687.2* [hot-topic]

Vladimir ZIVKOVIC¹, Mogens ISAGER¹, Michele PALAZZI², Ming Chuen Alvan LAM²

¹Infineon Technologies, Denmark

²Infineon Technologies, USA

09:30 - 10:30 (CEST) **Special Session 3** (Room MAGNA)

Impact of Atmospheric and Space Radiation on Sensitive Electronic Devices

Organizer/Session Chair: Luigi DILILLO (University of Montpellier, CNRS, LIRMM, FRANCE)

9:30 - 9:50 *Radiative environments and prediction tools*

Frédéric Wrobel

IES, University of Montpellier, France

9:50 - 10:10 *Effects of radiation on electronic memories*

Lucas Matana Luza

LIRMM, University of Montpellier, CNRS, France

10:10 - 10:30 *Effects of radiation on microprocessors*

Luis Entrena

University Carlos III, Madrid, Spain

09:30 - 10:30 (CEST) **McCluskey PhD Contest Session** (Room B)

Session Chair: Alberto Bosio, Lyon Institute of Nanotechnology, France

Session Co-chair: Alessandro Savino, Politecnico di Torino, Italy

09:30 - 09:50 *New Techniques for On-line Testing and Fault Mitigation in GPUs*

Josie RODRIGUEZ CONDIA

Politecnico di Torino, Italy

09:50 - 10:10 *Next Generation Design For Testability, Debug and Reliability Using Formal Techniques*

Sebastian HUHN

University of Bremen, Germany

10:10 - 10:30 *On Design for Reliability for Digital VLSI Systems*

Chih-Hao WANG

National Sun Yat-sen University, Taiwan

10:30 - 11:15 (CEST) Coffee Break & **Posters McCluskey PhD Contest**

11:15 - 12:45 (CEST) **Session 7: Diagnosis and Stress Test** (Room A)

Session Chair: Jerzy Tyszer, Poznan University of Technology, Poland

11:15 - 11:45 *CNN-based Data-Model Co-Design for Efficient Test-termination Prediction* [regular]

Hongfei WANG, Zhanfei WU, Wei LIU

Huazhong University of Science and Technology, China

11:45 - 12:15 *Optimized diagnostic strategy for embedded memories of Automotive Systems-on-Chip*

[regular]

(Best Paper Award Candidate)

Paolo BERNARDI¹, Giorgio INSINGA¹, Giovanni PAGANINI¹, Riccardo CANTORO¹, Peter BEER², Nellina MAUTONE², Pierre SCARAMUZZA², Giambattista CARNEVALE², Matteo COPPETTA², Rudolf ULLMANN²

¹Politecnico Di Torino, Italy

²Infineon Technologies, Germany and Italy

12:15 - 12:45 *An Optimized Burn-In Stress Flow targeting Interconnections logic to Embedded Memories in Automotive Systems-on-Chip* [regular]

Francesco ANGIONE¹, Paolo BERNARDI¹, Gabriele FILIPPONI¹, Matteo SONZA REORDA¹, Davide APPELLO², Vincenzo TANCORRE², Roberto UGIOLI²

¹Politecnico Di Torino, Italy

²STMicroelectronics, Agrate Brianza, Italy

11:15 - 12:45 (CEST) **Special Session 4** (Room MAGNA)

Machine Learning for Test, Diagnosis, Post-Silicon Validation and Yield Optimization

Organizer/Session Chair: Ilia Polian (Univ. Stuttgart, Germany),

Matteo Sonza Reorda (Politecnico di Torino, Italy)

11:15 - 11:45 *Learning to Tune in Post-silicon Validation*

Dirk Pflüger

University of Stuttgart, Germany

11:45 - 12:15 *Adapting Machine Learning to Test and Diagnosis Problems*

Krishnendu Chakrabarty

Duke University, Durham, NC, USA

12:15 - 12:30 *Brain-Inspired Machine Learning for Semiconductor Test and Reliability*

Hussam Amrouch

University of Stuttgart, Germany

12:30 - 12:45 *Industrial Solutions for Machine-Learning-Enabled Yield Optimization and Test*

Matthias Sauer

Advantest Europe, Boeblingen, Germany

11:15 - 12:45 (CEST) **Vendor Session 2** (Room B)

Session Chair: Lee Harrison, Siemens EDA, Chelmsford, United Kingdom

11:15 - 11:45 *Machine Learning for DFT and ATPG*

Yu HUANG

HiSILICON Inc., Shenzhen, China

11:45 - 12:15 *Functional Safety Challenges and Solutions for the ARM® MaliTM-G78AE GPU*

Prashant KULKARNI¹, Kartik KATHURIA¹, Jussi PENNALA²

¹ARM, Cambridge, United Kingdom

²ARM, Lund, Sweden

12:15 - 12:45 *3D IC DFT Implementation and Interconnect Test Based on IEEE 1838*

Lukasz KOTYNIA¹, Frederic AZOULAY¹, Vivek CHICKERMANE², Sagar KUMAR², Rajesh KHURANA²

¹CADENCE Design Systems, POLAND

²CADENCE Design Systems, USA

12:45 - 14:00 (CEST) Lunch

14:00 - 15:00 (CEST) **Session 8: Emerging Technologies Test** (Room A)

Session Chair: Ioana Vatajelu, UGA/CNRS/G-INP/TIMA, Grenoble, France

14:00 - 14:30 *On the Impact of Hardware Timing Errors on Stochastic Computing based Neural Networks* [regular]

(Best Paper Award Candidate)

Florian NEUGEBAUER¹, Stefan HOLST², Ilia POLIAN¹

¹University of Stuttgart, Germany

²Kyushu Institute of Technology, Iizuka, Japan

14:30 - 15:00 *PVT Analysis for RRAM and STT-MRAM-based Logic Computation-in-Memory* [regular]

(Best Paper Award Candidate)

Moritz FIEBACK¹, Christopher MÜNCH², Anteneh GEBREGIORGIS¹, Guilherme CARDOSO MEDEIROS¹,

Mottaqiallah TAOUIL¹, Said HAMDIOUI¹, Mehdi TAHOORI²

¹Delft University of Technology, The Netherlands

²Karlsruhe Institute of Technology, Germany

14:00 - 15:00 (CEST) **Embedded Tutorial Session 3** (Room MAGNA)

Post-Silicon SoC (System on Chip) Validation Coverage Challenges

Organizer: Chinna PRUDVI (Intel Corporation, USA)

Session Chair: Erik Larsson, Lund University, Sweden

Speakers: Chinna PRUDVI (Intel, USA), SANKARAN MENON (Intel, USA), Rathish JAYABHARATHI

(Intel,USA), Bhvanesh MATHUR (Intel USA), Spencer MILLICAN (Auburn University, USA)

14:00 - 14:15 *Introduction – Coverage for Manufacturing and Validation*

14:15 - 14:30 *Pre-to-Post Silicon Validation Coverage*

14:30 - 14:45 *Post-Silicon SOC Validation Coverage Challenges*

14:45 - 15:00 *Conclusions and future work: AI and machine-learning opportunities*

14:00 - 15:00 (CEST) **Vendor Session 3** (Room B)

Session Chair: Daniel Tille, Infineon Technologies, Germany

14:00 - 14:30 Rich Interactive Test Database (RITdB): The Interplanetary Database for Manufacturing
Mark ROOS

ROOS Instruments Inc., Santa Clara, USA

14:30 - 15:00 Testing and Analyzing Throughout the Silicon Lifecycle

Robert RUIZ, Ramsay ALLEN

SYNOPSYS Inc., Mountain View, USA

15:00 - 15:30 (CEST) **Awards & Closing** (Room MAGNA)