

DTTIS'2023 Technical Program

 **dttis** 2023 IEEE International conference on
Design, Test & Technology of Integrated Systems



Wednesday, November, 01st, 2023

🕒 14:30 @ 16:00

Tutorial 1:

Design for Excellence Practices for Integrated Circuits

Speaker: 👤 Dr. Saghir A. Shaikh, Intel Corporation, San Diego, CA

🕒 16:00 @ 16:30

☕ Coffee Break

🕒 16:30 @ 18:00

Tutorial 2:

RISC-V processor for embedded systems

Speaker: 👤 Pr. Imed Ben Dhaou, Dar Al-Hekma University, SA.

Thursday, November, 02nd, 2023

🕒 08:30 @ 09:00

Registration

🕒 09:00 @ 09:30

Opening Session

👤 Dr. Salem Abdennader, Pr. Mohamed Masmoudi: Conference Chairs

👤 Pr. Hassene Mnif, ENET'COM, Tunisia: Technical Committee Chair

👤 Dr. Amel Neifar: Organisation Committee Chair

🕒 09:30 @ 10:30

Plenary session

Circuits and technologies for implantable biomedical devices

Speaker: 👤 Prof. Carolina Mora Lopez, KU Leuven, Belgium.

Session Chair: 👤 Prof. Brahim Mezghani, ENIS, University of Sfax, Tunisia.

🕒 10:30 @ 11:00

☕ Coffee Break

🕒 11:00 @ 13:00

Session 1: Integrated Systems Design

Session Chairs: 👤 Prof. Hassen Aziza, M2NP, France

👤 Prof. David Cordeau, XLIM laboratory University of Poitiers, France

- 11h00 - 11h25 LiFi-CFI: Light-weight Fine-grained Hardware CFI Protection for RISC-V; Mahboobe Sadeghipour Roudsari, Fatemeh Sheikhshoei, Nicolo Maunero, Paolo Prinetto and Zain Navabi; IMT School for Advanced Studies, Lucca, Italy; Department of Automation and Information, Politecnico di Torino, Turin, Italy; School of Electrical and Computer Engineering, U. of Tehran, Tehran, Iran
- 11h25 - 11h50 Simulation Improvements, Challenges & Solutions while Using DTL, Signal Access & DebuggerDB Optimization, PC, TC, Save-Restore; Sourabh Saluja, Yaswani Priyanka Vempali, Syed Kamil Hussain Samnani, Joe Manzella, Harbaksh Mangat, Vineet Kumar Dubey, Prabahar Krishna Gounder and Ankit Gopani; Network & Edge Group, Product Enablement Solutions Group, Intel Corporation; Bengaluru, India; Allentown, US; Oregon, US; Arizona, US; California, US
- 11h50 - 12h15 Discrete Wavelet Transform Coefficients for Drowsiness Detection from EEG Signals; Aymen Zayed, Khaled Ben Khalifa, Nidhameddine Belhadj, Mohamed Hedi Bedoui and Carlos Alberto Valderrama Sakuyama; Faculty of Polytechnic, University of Mons, Mons, Belgium; University of Sousse, Tunisia.
- 12h15 - 12h40 Enhancing Performances of Intelligent EEG Signal Processing for Epilepsy Diagnosis; Jihen Souissi, Afifa Jridi and Ridha Djemal; ATMS- Laboratory, ENIS, Tunisia.
- 12h40 - 13h05 Multi-objective Optimisation of RISC-V CV32A6 for ML application; Bastien Hubert & Omar Hammami; ENSTA Paris, Palaiseau, France.

🕒 13:00 @ 14:15

🍴 Lunch

🕒 14:15 @ 16:00

Session 2: Integrated Systems Testing

Session Chairs: 👤 Prof. Said Hamdioui, Delft University of Technology, Netherland

👤 Prof. Ahmed Fakhfakh, CRNS, University of Sfax, Tunisia

- 14h15 - 14h40 High-Speed IO IP Process Technology & Design Interactions: Problems & Solutions; Abdennadher Salem; Intel Corporation, Folsom, USA
- 14h40 - 15h05 Design techniques for reference clock jitter optimization for high speed PHYs; Rohini Krishnan, Tejas Potphode, Ashish Sharma, Haijin Zhang, Herry Hu and David R Mulvihill; Networking group, Intel Technology India Pvt. Ltd, Bangalore, India; Power solutions Group, Intel Corporation, Shanghai, China; IP design Group, Intel Corporation, Fort Collins, Colorado, USA
- 15h05 - 15h55 **Invited Paper:** Advanced IC packaging in the context of multi-chiplet based architectures; Syhem Larguech; Application Engineer at Cadence Design Systems, München, Bayern, Deutschland.

🕒 15:50 @ 16:15

☕ Coffee Break

🕒 16:15 @ 18:00

Special Session: New trends on embedded systems: special focus on the emerging applications Artificial Intelligence AI and blockchain.

Speakers: 👥 Nader Ben Amor, Jalel Ktari and Tarek Frikha, University of Sfax, Tunisia & Fakhreddine Ghaffari, Cy Cergy Paris university.

Session Chair: 👤 Prof. Nader Ben Amor, ENIS, University of Sfax, Tunisia.

Description:

Embedded systems are a category of electronic systems dedicated for a specific task or domain. They are used in various domains such as consumer electronics, automobiles, medical devices, mobile robots and industrial automation. With the rapid emergence of complex applications such as artificial intelligence (AI) and blockchains techniques, the integration of these advanced algorithms into embedded systems has become increasingly important and challenging. Indeed, as these applications are both data and computing intensive, their execution on relatively low complex architecture puts stringent constraints on both applications and architectures.

The scope of this special issue includes, but is not limited to the following topics:

- FPGA-based AI accelerators
- AI applications for mobile robots
- Cases study of Edge AI GPU Computing
- Blockchain architectures with embedded systems
- Blockchain applications for embedded systems
- Blockchain consensus HW implementation
- Lightweight Blockchain implementation

16h15 - 16h40 Advanced Bone Fracture Detection Through Deep Learning with Radiological Imaging; Wali Ibtissem, Hazar Mokaddem, Akram Bouzid, Amina Kessentini and Nouri Masmoudi; LETI, ENIS, Tunisia; ISIMG, Tunisia; surgery department Orthopaedic doctor national hospital of Djbeniana Sfax, Tunisia.

16h40 - 17h05 HealthBeat traceability platform based on blockchain technology; Hedi Choura, Jalel Ktari, Mouna Baklouti, Faten Chaabane, Najoua Ben Slima, Khouloud Yaich, Ameni Guesmi and Tarek Frikha; CES Lab, ENIS, University of Sfax, Tunisia; DES Research Unit, FSS, ISIMG, University of Gabes, Tunisia; Computer Sciences and Applied Mathematiques department, ENIS, University of Sfax, Tunisia

17h05 - 17h30 Fusion with EEG signals and Images for closed or open eyes detection using deep learning; Lassaad Zaway, Nader Ben Amor, Jalel Ktari, Mohamed Jallouli, Larbi Chrifi-Alaoui and Laurent Delahoche; CES-Laboratory, ENIG, University of Gabes, Gabes, Tunisia; CES-Laboratory, ENIS, University of Sfax, Sfax, Tunisia; Laboratory LTI, University of Picardie Jules Verne, Amiens, France

17h30 - 17h55 STM32 miner A lightweight blockchain mining system; Jalel Ktari, Hedi Choura, Tarek Frikha and Mouna Baklouti; CESLab, ENIS, Sfax, Tunisia; Computer Sciences and Applied Mathematiques department, ENIS, Tunisia.

Friday, November, 03rd, 2023

🕒 8:30 @ 09:00

Registration

🕒 9:00 @ 10:00

Plenary session

It's time to understand the physical mechanism behind deep learning

Speaker: 🧑 Pr. Habib Hamam, U. Moncton, Canada.

Session Chair: 🧑 Prof. Salem Abdennadher, Intel, USA

🕒 10:00 @ 10:30

☕ Coffee Break

🕒 10:30 @ 12:30

Session 3: Integrated Systems technology and design

Session Chairs: 🧑 Prof. Hussam Amrouch, TUM, Germany

🧑 Prof. Kosai Raoof, Le Mans University, France

- 10h30 - 10h55 Analysis and design of an innovative 19.5 GHz active phase shifter architecture, implemented in a 0.13 μm BiCMOS SiGe:C process, for beamforming in 5G applications; Nuraddeen Ado Muhammad, David Cordeau and Jean-Marie Paillot; Université de Poitiers – CNRS-XLIM, UMR 7252, Angoulême, France
- 10h55 - 11h20 Notched gate MOSFET for capacitance reduction in RF SOI technology; Lucas Antunes, Pascal Masson, Julien Amouroux, Stephane Monfray, Julien Dura, Frederic Giancesello, Julien Babic, Romain Debroucke, Loic Welter, Siddhartha Dhar, Bernadette Gros, Clement Charbuillet, Franck Julien, Guillaume Bertrand, Arnaud Regnier and Alain Fleury; STMicroelectronics, 190 avenue Celestin Coq, Rousset 13016, France ; University of Côte d'Azur, Polytech'Lab UPR UCA 7498, Sophia-Antipolis, France ; STMicroelectronics, 850 Rue Jean Monnet, Crolles 38920, France
- 11h20 - 11h45 Low-Power Envelope Detector for WSN Wake-up Receiver Applications; Mariem Bouraoui, Amel Neifar and Imen Barra; Systems Integration and Emerging Energies Laboratory, ENIS, Tuinsia; ENIG, University of Gabes, Tunisia; Department of Computer Engineering, College of Computer Engineering and Sciences, Prince Sattam Bin Abdulaziz University, Al-Kharj 11942, Saudi Arabia.
- 11h45 - 12h10 Optimization and Experimentation of a 3-axis Piezoelectric Accelerometer with Cylindrical Proof Mass; Dorra Nasr, Mohamed Hadj Said, Samer Lahouar, Mounir Mansour and Fares Tounsi; CRMN, Sousse, MACSI, Sousse, Tunisia; Laboratory of Microelectronics and Instrumentations, FSM, Tunisia; Military academy of Fondouk Jedid, Tunisia; Laboratory of Microelectronics and Instrumentation, FSM, Tunisia; S2E Laboratory, ENIS, Sfax University, Tunisia.
- 12h10 - 12h35 Simulation of waveguide port position of the double rectangle metamaterial shape; Abderraouf Fadhel, Hassene Mnif, Rahma Aloulou, Souad Berhab and Abdennour Belhedri; LETI, ENIS, University of Sfax; ENET'Com, Sfax; Dept. of Electronic and Telecommunications, University of Kasdi Merbah Ouargla; STIC Laboratory, Faculty of Technology, University of Tlemcen, Algeria

🕒 12:35 @ 14:00

🍴 Lunch

🕒 14:00 @ 15:30

Embedded tutorial: what's up with Analog Defect Coverage?

Speaker: 👤 Dr Salem Abdennadher, Intel, USA.

Summary:

There have been a variety of analog defect models in use over the past 30 years. Some relied on mapping manufacturing defects to devices and circuits relying on process variations, block-level parametric variations, and circuit-level specification variations. One of the common limitations of these analog defect models is how theoretically valid, experimentally verifiable, and computationally efficient to support test developments and quality improvements. There have been obvious impediments to the development of a standard to address analog defect model. The process to create most of the existing used models have never been clarified, never been unified in industry, and always left as future work to be done later. IEEE P2427 WG is addressing the future now by working on a standard that defines a defect coverage accounting method based on simulation models for manufacturing defects observed within analog integrated circuits (ICs). IEEE P2427 Working Group draft standard is being produced that includes: state-of-the-art in analog defect simulation summary, an extensive set of concise definitions, and rules/recommendations for clear reporting on analog defect and fault coverage. This workshop will introduce this new proposed standard which defines a defect coverage accounting method based on simulation models for manufacturing defects observed within integrated circuits. The portion of all possible defects that are detected by manufacturing and System level tests of analog and mixed-signal circuits in practice depends on many factors: detectability, defect characteristics, detection threshold margin, measurement resolution, operating point, test patterns,), which this standard considers as it defines how to report coverage.

🕒 16:00 @ 19:00

Social activities

🕒 19:00 @ 22:00

🍴 Gala Dinner

Saturday November, 04th, 2023

🕒 09:00 @ 10:00

Plenary session

The Enabling Role of Photonics in Next Generation Digital Systems and Subsystems for future WEB 3.0

Speaker: 👤 Pr. Habib Fathallah, University of Carthage, Tunisia.

Session Chair: 👤 Prof. Ahmed Fakhfakh, CRNS, University of sfax, Tunisia

🕒 10:00 @ 11:00

Poster presentations:

Session Chairs: 👤 Prof. Hatem Trabelsi, ENIS, University of sfax Tunisia

👤 Prof. Ioannis Voyiatzis, UNIWA, Greece

10h00 - 10h08 Statistical study of the H.266/VVC Low-Frequency Non-Separable Transform; Sonda Ben Jdidia, Fatma Belghith and Nouri Masmoudi; National Engineering School Of Sfax LETI Laboratory, Sfax, Tunisia

10h08 - 10h16 Novel and Scalable Instantaneous Voltage Drop based Scan Methodology; Intel Technology India Pvt. Ltd. Bangalore, India.

10h16 - 10h24 Quantization effect on MRF performance for VVC encoder; Rana Jassem, Taheni Damak, Mohamed Ali Benayed and Nouri Masmoudi; Department of Computer Science, College of Education for Pure Sciences, University of Basrah, Basrah, Iraq; NTS'Com, Sfax University, Tunisia; LETI Laboratory, ENIS, Tunisia

10h24 - 10h32 Static non-linear errors compensation for RF front-end circuit on high speed RF sampling (Ti)ADCs; Clement Bonnafox, Youssef Serrestou, Kosai Raouf and Pascal Urard; STMicroelectronics, LAUM Laboratory, Le Mans, France; ENSIM Engineering school Le Mans, France; ENSIM Engineering school, LAUM Laboratory Le Mans, France; STMicroelectronics Crolles, France.

10h32 - 10h40 Cortex-M0+-based Pacemaker: CMOS Technologies Benchmark to Achieve Ultra-Low Power Operations; Wafa Zitouni, Rémy Vauche, Hassen Aziza, Laila Ayache and Alaa Makdissi; Aix-Marseille Univ, Univ Toulon, CNRS, IM2NP, Marseille, France ; Cairdac, 8 Rue de la Renaissance, 92160 Antony, France.

10h40 - 10h48 A Low Noise Amplifier for Medical Implant Communication System Band; Maissa Daoud, Mohamed Ghorbel and Hassene Mnif; Electronics and Information Technology Laboratory, University of sfax, Tunisia; Advanced Technologies for Medicine and Signals, University of sfax, Tunisia.

🕒 11:00 @ 11:30

☕ Coffee Break & Poster session

🕒 11:30 @ 12:00

Closing Session

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