



11th Conference on Design and Technology of Integrated Systems in Nanoscale Era (DTIS) 2016

April 12 - 14, 2016
Istanbul, Turkey
<http://www.dtis2016.teiath.gr>

Timetable

Tuesday 12/3		Wednesday 13/5		Thursday 14/5	
08:30-09:00	Registration & Opening	08:30-09:00	Registration	09:00-09:30	Registration
09:00-10:00	Keynote 1	09:00- 10:00	Keynote 2	9:30-10:30	Keynote 3
10:00-10:50	Coffee Break & PS1	10:00-10:50	Coffee Break & PS2	10:30-11:00	Coffee Break
10:50-12:30	S1	10:50-12:30	S3	11:00-12:15	S5
12:30-14:00	Lunch	12:30-13:30	Lunch	12:15-13:30	Lunch
14:00-15:15	S2	13:30-15:10	S4	13:30-15:10	S6
15:15-15:45	Coffee Break	15:10-15:40	Coffee Break	15:10-15:40	Farewell Coffee
15:45-16:45	Tutorial	15:40-22:00	Social Event		Closing

S1: Security and Test

S2: Digital Design and NoC

S3: Approximate Computing

S4: Unconventional Technological Implementation

S5: Analog Design

S6: Power and Technological Challenges

PS: Poster Session

DTIS 2016 Foreword

On behalf of the Steering, Organizing and Program Committees, we would like to welcome you to the International Conference on *Design and Technology of Integrated Systems in nanoscale era* (DTIS) 2016, an event devoted to presenting and discussing scientific trends, emerging results, hot topics, and practical applications in the area of design and technology of integrated systems.

DTIS 2016 is the 11th edition of this conference and is held in Istanbul, Turkey. Located in the center of the Old World, Istanbul is one of the world's great cities famous for its historical monuments and magnificent scenic beauties. It is the only city in the world which spreads over two continents: it lies at a point where Asia and Europe are separated by a narrow strait called the Bosphorus. Istanbul has a history of over 2,500 years and has been the capital of three great empires, the Roman, Byzantine and Ottoman empires. The historic city center, known as the Old City, is surrounded by 5th century Roman city walls and partially listed as a UNESCO World Heritage Site. Istanbul is adorned by masterpieces of Roman, Byzantine and Ottoman art including the Hagia Sophia, the Blue Mosque, the Imperial Topkapi Palace and the Basilica Cistern. More over 10 million foreign tourists visit Istanbul annually, making it the world's 5th most popular tourist destination.

DTIS 2016 starts on Tuesday, April 12th and implements a three-day technical program, including 3 Keynotes, 6 Technical Sessions, 2 Poster Sessions, and 1 Embedded Tutorial.

DTIS 2016 received a large number of contributions from all over the world. An electronic version of the formal proceedings has been included in a flash memory that is distributed to conference attendees.

DTIS2016 is the achievement of the contributions by many volunteers, who give generously their time to contribute to the success of the symposium. We would like to thank all of them for their efforts.

We are confident that you will find DTIS 2016 a productive and exciting experience, and we would like to welcome you in Istanbul.

Selcuk Baktir & Suleyman Tosun
DTIS 2016 General Chairs

Lukas Sekanina
DTIS 2016 Program Chair

Tuesday April 12

08:30 - 08:45 **Registration**

08:45 – 09:00 **Opening Session**

09:00 – 10:00 **Keynote #1**

Do You Trust Your Chip?

Ozgun Sinanoglu (NYU, Abu Dhabi, UAE)

Chair: Selcuk Baktir (Bahcesehir University, Turkey)

10:00 – 10:50 **Coffee Break & Poster Session #1**

A Genetic Algorithm Based Remaining Lifetime Prediction for a VLIW Processor Employing Path Delay and IDDX Testing

Yong Zhao and Hans Kerkhoff (University of Twente, Netherlands)

Implementation of a Secured Digital Ultralight 14443-Type A RFID tag with an FPGA Platform

Naija Yassine¹, Berouille Vincent², Hely David², and Machhout Mohsen³

(¹National School of Engineers of Sousse (ENISO), Tunisia; ²LCIS, France; ³FSM, Tunisia)

Residue Number System as a Side Channel and Fault Injection Attack Countermeasure in Elliptic Curve Cryptography

Apostolos P. Fournaris¹, Louiza Papachristodoulou², Lejla Batina², and Nicolas Sklavos³ (¹T.E.I. of Western Greece, Greece; ²Radboud University Nijmegen, Netherlands; ³University of Patras, Greece)

An Efficient Mapping Algorithm on 2-D Mesh Network-on-Chip with Reconfigurable Switches

Salih Bayar and Arda Yurdakul (Bogazici University, Turkey)

Identification of delay defects on embedded paths using one current sensor

Wisam Aljubouri, Spyros Tragoudas, and Themistoklis Haniotakis (Southern Illinois University Carbondale, USA)

10:50 – 12:30 **Session 1: Security and Test**

Chair: Nicolas Sklavos (University of Patras, Greece)

SEcube: An Open-Source Security Platform in a Single SoC

Antonio Varriale¹, Elena Ioana Vatajelu², Giorgio Di Natale³, Paolo Prinetto², Pascal Trotta² and Tiziana Margaria⁴ (¹Blu5 Labs Ltd., Malta ; ²Politecnico di Torino, Italy ; ³LIRRM, France ; ⁴Lero, Ireland)

Simple Tri-State Logic Trojans Able to Upset Properties of Ring Oscillators

Leonel Acunha Guimarães, Rodrigo Possamai Bastos, Thiago Ferreira de Paiva Leite and Laurent Fesquet (Univ. Grenoble Alpes, CNRS, TIMA, France)

Qualitative Techniques for System-on-Chip Test with Low-Energy Protons

*Stefano Di Mascio¹, Marco Ottavi¹, Gianluca Furano², Tomasz Szewczyk²,
Alessandra Menicucci³, Luigi Campajola⁴, and Francesco Di Capua⁴
(¹University of Rome Tor Vergata, Italy; ²European Space Agency,
Netherlands; ³Delft University of Technology, Netherlands; ⁴University of
Naples Federico II, Italy)*

***Efficient Selection of critical paths for delay defects in the presence of
process variations***

*Phaninder Alladi and Spyros Tragoudas (Southern Illinois University
Carbondale, USA)*

12:30 – 14:00 Lunch

14:00 – 15:15 Session 2: Digital design and NoC

Chair: H. Fatih Ugurdag (Ozyegin University, Turkey)

***Dynamically Reconfigurable FFT Processor for Flexible OFDM Baseband
Processing***

*Mario Lopes Ferreira, Amin Barahimi and João Canas Ferreira (INESC
TEC, Portugal)*

Fused Modulo 2^{n+1} Add-Multiply Unit For Weighted Operands

*Kiamal Pekmestzi¹, Konstantinos Tsoumanis¹ and Costas Efstathiou²
(¹National Technical University of Athens, Greece; ²TEI of Athens, Greece)*

***FPGA Implementation of a Fault-Tolerant Application-Specific NoC
Design***

*Serif Yesil¹, Suleyman Tosun² and Ozcan Ozturk¹
(¹Bilkent University, Turkey; ²Hacettepe University, Turkey)*

15:15 – 15:45 Coffee Break

15:45 – 16:45 Tutorial: Evolvable Hardware in FPGAs

*Speaker: Ruben Salvador, (Universidad Politécnica de Madrid, Spain)
Chair: Lukas Sekanina (Brno University of Technology, Czech Republic)*

Wednesday April 13

08:30 - 09:00 Registration

09:00 – 10:00 Keynote #2

Approximate Computing for Unreliable Silicon

Andreas Peter Burg (EPFL, Switzerland)

Chair: Lukas Sekanina (Brno University of Technology, Czech Republic)

10:00 – 10:50 Coffee Break & Poster Session #2

Analytical Optimization of interdigitated sensor for biological medium characterization

Meriem Dekmous, Abdelghani Lakhdari, Hassan Mouhadjer and Nasradine Mekkakia- Maaza (Université de Science et de la Technologie d'Oran Mohammed Boudiaf, Algeria)

Lowpass Filter Design Technique for Hybrid and Monolithic Implementation

Fayçal Amrani¹, Mohamed Trabelsi², Abdelhalim A. Saadi¹ and Rachida Touhami¹ (¹USTHB, Algeria; ²Ecole Nationale Polytechnique, Algeria)

MAC Unit for Reconfigurable Systems Using Multi-Operand Adders with Double Carry-Save Encoding

Ugur Cini and Olcay Kurt (Trakya University, Turkey)

Register File Reliability Enhancement Through Adjacent Narrow-width Exploitation

Ihsen Alouani¹, Hamzeh Ahangari², Ozcan Ozturk², Smail Niar¹ and Atika Menhaj¹ (¹University of Valenciennes, France; ²Bilkent University, Turkey)

FPGA Implementations of HEVC Sub-Pixel Interpolation Using High-Level Synthesis

Firas Abdulghani, Ercan Kalali and Ilker Hamzaoglu (Sabanci University, Turkey)

A High Performance Hardware for Early Terminated C-1BT Based Motion Estimation

Abdulkadir Akin and Ilker Hamzaoglu (Sabanci University, Turkey)

10:50 – 12:30 Session 3: Special Session on Approximate Computing

Organizers: Zdenek Vasicek¹ and Paul Kaufmann² (¹Brno University of Technology, Czech Republic; ²University of Paderborn, Germany)

Chair: Andreas Peter Burg (EPFL, Switzerland)

Automatic Design of Approximate Circuits by Means of Multi-Objective Evolutionary Algorithms

Radek Hrbacek, Vojtech Mrazek and Zdenek Vasicek (Brno University of Technology, Czech Republic)

Auto-Adaptive Ultra-Low Power IC

Alberto Bosio¹, Philippe Debaud², Patrick Girard¹, Stephane Guilhot²,

Miroslav Valka³ and Arnaud Virazel¹ (¹LIRMM, France; ²ST-Microelectronics Grenoble, France; ³Grenoble University, France)

An Extendible Design Exploration Tool for Supporting Approximate Computing Techniques

Mario Barbareschi, Federico Iannucci and Antonino Mazzeo (DIETI - University of Naples Federico II, Italy)

Voltage Over-Scaling in Sequential Circuits for Approximate Computing

David May and Walter Stechele (Technische Universität München, Germany)

12:30 – 13:30 Lunch

13:30 – 15:10 Session 4: Unconventional Technological Implementation

Chair: Alberto Bosio (LIRMM, France)

Boolean Logic Gate Exploration for Memristor Crossbar Arrays

Lei Xie, Hoang Anh Du Nguyen, Mottaqiallah Taouil, Said Hamdioui and Koen Bertels (Delft University of Technology, Netherlands)

A Novel Heterogeneous FPGA Architecture Based on Memristor-Transistor Hybrid Approach

Umer Farooq¹, M. Khurram Bhatti² and M. Hassan Aslam³ (¹LiP6, Université Pierre and Marie Curie, France; ²Information Technology University, Pakistan; ³CIIT, Lahore, Pakistan)

Lets Move Polymorphism Downwards On the Multifunctional Logic Based on Ambipolar Behaviour of Semiconductor Devices

Richard Ruzicka and Radek Tesar (Brno University of Technology, Czech Republic)

Multilevel Operation in Oxide Based Resistive RAM with SET voltage modulation

Hassen Aziza, Haythem El Ayari, Santhosh Onkaraiah, Mathieu Moreau, Jean-Michel Portal and Marc Bocquet (IM2NP - Aix-Marseille Université, France)

15:10 – 15:40 Coffee Break

15:40 – 22:00 Social Event: Sightseeing and Boat tour with dinner

Buses will take the attendees from the hotel at 15:40. We will have a sightseeing tour from 15:40 to 18:00. Then, we will have a boat tour on the Bosporus until 22:00. Dinner will be served on the boat. Buses will take the attendees back to the hotel.

Thursday April 14

09:00 – 09:30 Registration

09:30 – 10:30 Keynote #3

Low Power Digital Video Compression Hardware Design

Ilker Hamzaoglu (Sabanci University, Turkey)

Chair: Suleyman Tosun (Hacettepe University, Turkey)

10:30 – 11:00 Coffee Break

11:00 – 12:15 Section 5: Analog Design

Chair: Udo Schwalke, (Technische Universität Darmstadt, Germany)

Optimizing CMOS Analog Variable Gain Amplifier Cell For WiMAX Receiver

Sawssen Lahiani, Samir Ben Selem, Houda Daoud and Mourad Loulou (Sfax University, Tunisia)

Thikness Dependence Investigation of the Mutual Inductance Link in Concentric Planar Transformers

Hala Ghadhab¹, Mohamed Hadj Said², Fares Tounsi¹, Sandeep Surya³, Brahim Mezghani⁴ and Ramgopal Rao³ (¹ISIMM, Tunisia; ²ENIM, Tunisia; ³IIT Bombay, India; ⁴ENIS, Tunisia)

A discrete implementation of a bidirectional circuit for actuation and read-out of resonating sensors

Luca Marchetti¹, Amar Romi¹, Yngvar Berg¹, Omid Mirmotahari² and Mehdi Azadmehr¹ (¹Høgskolen i Sørøst – Norge, Norway; ²University of Oslo, Norway)

12:15 – 13:30 Lunch

13:30 – 15:10 Section 6: Power and Technological Challenges

Chair: Richard Ruzicka (Brno University of Technology, Czech Republic)

High Speed Content Addressable Memory with Reduced Size and Less Power Consumption

Hammad Riaz¹, Abdul Aziz Bhatti², Muhammad Ashraf Tahir¹ and Muhammad Sarwar¹ (¹Punjab Forensic Science Agency, Pakistan; ²University of Management and Technology, Pakistan)

High-Speed Dynamic Dual-Rail Ultra Low Voltage Static CMOS Logic operating at 300 mV

Omid Mirmotahari¹, Ali Dadashi¹, Mehdi Azadmehr² and Yngvar Berg² (¹University of Oslo, Norway; ²Vestfold University College, Norway)

Investigation of transfer-free catalytic CVD graphene on SiO₂ by Means of conductive atomic force microscopy

Dennis Noll and Udo Schwalke (Technische Universität Darmstadt, Germany)

Tip-enhanced Raman scattering of 4H-SiC films

Ru Han and Danghui Wang (Northwest Polytechnical University, China)

15:10 – 15:40 Farewell Coffee & Closing

DTIS 2016 Committees

General Chairs: *Selcuk Baktir* - Bahcesehir University, Turkey

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