

DSD Program

Wednesday 28th August

08:30-09:00 Theodora I & II OPENING REMARKS

09:00-10:00 Theodora I & II Keynote SEAA: Konstantinos Kaggelides

Chair: L. Angelis

10:00-11:00 Theodora I & II Keynote DSD: Rolf Drechsler

Chair: Hana Kubatova

11:00-11:30 POSTERS SESSION

ROOM: TBA

Chair: N. Konofaos

DSD-1

Room: Theodora I

Chair: O.P.Stan

- 11:30-12:00 16 **GRanDE: Graphical Representation and Design Space Exploration of Embedded Systems**
Rajesh Kedia, M. Balakrishnan and Kolin Paul.
- 12:00-12:30 4 **MARM-GA: Mapping Applications to Reconfigurable Mesh using Genetic Algorithm**
Pinar Kullu and Suleyman Tosun
- 12:30-13:00 37 **Multi-sensor Energy Efficient Obstacle Detection**
Anupam Sobti, M. Balakrishnan and Chetan Arora.

ASAASIT

Room: Athinais

Chair: I. Alouani

- 11:30-12:00 40 **Occupancy Grid Fusion of Low-Level Radar and Time-of-Flight Sensor Data**
Josef Steinbaeck, Christian Steger, Eugen Brenner, Gerald Holweg and Norbert Druml
- 12:00-12:30 65 **TrustNet: Ensuring Normal-world and Trusted-world CANbus Networking**
Georgios Kornaros
- 12:30-13:00 136 **Analyzing the Impact of Probabilistic Estimates on Communication Reliability at Intelligent Crossroads**
Daniel Markert, Philip Parsch and Alejandro Masrur

AHSA-1

Room: Theodora II

Chair: P.Kitsos

- 11:30-12:00 2 **On the Bright Side of Darkness: Side-Channel Based Authentication Protocol Against Relay Attacks**
Guillaume Dabosville, Housseem Maghrebi, Alexis Lhuillery, Thanh-Ha Le and Julien Bringer.
- 12:00-12:30 45 **Circumventing Uniqueness of XOR Arbiter PUFs**
Caio Hoffman, Catherine Gebotys, Diego F. Aranha, Mario Cortes and Guido Araujo.
- 12:30-13:00 67 **Toward a Hardware Man-in-the-Middle Attack on PCIe bus for Smart Data Replay**
Mohamed Amine Khelif, Jordane Lorandel, Olivier Romain, Guillaume Barbu, Matthieu Regnery and Denis Baheux.

AHSA-2

Room: Theodora II

Chair: O.Koufopavlou

- 14:30-15:00 75 **Authenticated Encryption Schemes on Java Card**
Rajesh Kumar Pal.
- 15:00-15:30 76 **Application Study of Hardware-Based Security for Future Industrial IoT**
Rainer Matischek and Benjamin Bara
- 15:30-16:00 86 **Design and Implementation of a Fast and Scalable NTT-Based Polynomial Multiplier Architecture**
Ahmet Can Mert, Erdinc Ozturk and ErKay Savas
- 16:00-16:30 89 **Deep Learning Side-Channel Attack against Hardware Implementations of AES**
Takaya Kubota, Kota Yoshida, Mitsuru Shiozaki and Takeshi Fujino

DSD-2

Room: Theodora I
Chair: N.Konofaos

- 14:30-15:00 50 **A Microprogrammed Approach for Implementing Statecharts**
 Javier Cereijo-Garcia and Roberto Osorio
- 15:00-15:30 51 **AEx: Automated Customization of Exposed Datapath Soft-Cores**
 Alex Hirvonen, Kati Tervo, Heikki Kultala and Pekka Jääskeläinen.
- 15:30-16:00 53 **A hardware accelerator for edge detection in high-definition video using cellular neural networks**
 Ignacio Perez, Wladimir Valenzuela and Miguel Figueroa
- 16:00-16:30 55 **An RTL ATPG Flow Using the Gate Inherent Fault (GIF) Model Applied On Non-, Standard- And Random-Access-Scan (RAS)**
 Tobias Strauch.

AMDL

Room: Athinais
Chair: O.Krejcar

- 14:30-15:00 10 **Information coding and hardware architecture of spiking neural networks**
 Nassim Abderrahmane and Benoît Miramond
- 15:00-15:30 88 **Graphical Model Transformation Analysis for Cognitive Computing and Machine Learning on the SpiNNaker Chip Multiprocessor**
 Dan Mendat and Andreas Andreou
- 15:30-16:00 95 **TOT-Net: An Endeavour Toward Optimizing Ternary Neural Networks**
 Najmeh Nazari, Mohammad Loni, Mostafa E. Salehi, Masoud Daneshtalab and Mikael Sjödin
- 16:00-16:30 110 **Keyword Spotting using Time-domain Features in a Temporal Convolutional Network**
 Emad A. Ibrahim, Jos Huisken, Hamed Fatemi and Jose Pineda de Gyvez

16:30-17:00 POSTERS SESSION

ROOM: TBA
Chair: N. Konofaos

FTET

Room: Theodora II
Chair: O.Keszöcze

- 17:00-17:30 41 **Testability of Switching Lattices in the Cellular Fault Model**
 Anna Bernasconi, Valentina Ciriani and Luca Frontini
- 17:30-18:00 97 **PoLibSi: Path Towards Intrinsically Reconfigurable Components**
 Jan Nevoral, Václav Šimek and Richard Růžička
- 18:00-18:30 108 **PAIG Rewriting: The Way to Scalable Multifunctional Digital Circuits Synthesis**
 Adam Crha, Václav Šimek and Richard Růžička

DCPS-1

Room: Athinais
Chair: H. Arne

- 17:00-17:30 33 **An Application of Hyper-Heuristics to Flexible Manufacturing Systems**
 Alexis Linard and Joost van Pinxten
- 17:30-18:00 93 **Leveraging Domain Knowledge for the Efficient Design-Space Exploration of Advanced Cyber-Physical Systems**
 Yon Vanommeslaeghe, Joachim Denil, Jasper De Viaene, David Ceulemans, Stijn Derammelaere and Paul De Meulenaere
- 18:00-18:30 139 **Enhancing Battery Pack Capacity Utilization in Electric Vehicle Fleets via SoC-Preconditioning**
 Alexander Lamprecht, Ananth Garikapati, Swaminathan Narayanaswamy and Sebastian Steinhorst

DSD-3

Room: Theodora I
Chair: A.Žemva

- 17:00-17:30 19 **MicroLET: A new SDNoC-based communication protocol for chipLET-based systems**
 Sultana Ellinidou, Gaurav Sharma, Sotirios Kontogiannis
- 17:30-18:00 20 **Real-Time Textureless-Region Tolerant High-Resolution Depth Estimation System**
 Bilal Demir, Jean-Philippe Thiran and Yusuf Leblebici
- 18:00-18:30 30 **SAT-Hard: A Learning-based Hardware SAT-Solver**
 Buse Ustaoglu, Sebastian Huhn, Frank Sill Torres, Daniel Große and Rolf Drechsler

18:30 Welcome Cocktail
Room: TBA

Thursday 29th August

9.00-10.00 Theodora I & II Keynote DSD: Yervant Zorian

Chair: L.Jozwiak

10:00-11:00- Theodora I & II Keynote SEAA: Helena Holmström Olsson

Chair: A.Chatzegeorgiou

11:00-11:30 POSTERS SESSION

ROOM: TBA

Chairs: N. Konofaos/A.Zemva

DSD-4

Room: Theodora I

Chair: T.Orphanoudakis

- 11:30-12:00 44 **A Reconfigurable Architecture for Posit Arithmetic**
Souradip Sarkar, Purushotham Murugappa Velayuthan and Manil Dev Gomony
- 12:00-12:30 48 **Odyn: Deadlock Prevention and Hybrid Scheduling Algorithm for Real-Time Dataflow Applications**
Benjamin Dauphin, Renaud Pacalet, Andrea Enrici and Ludovic Aprville
- 12:30-13:00 49 **Configurable Hardware Accelerator Architecture for Takagi-Sugeno Fuzzy Controller**
Oana Boncalo, Alexandru Amaricai and Zsofia Lendek

EPDSD-1

Room: Theodora II

Chair: L. Jozwiak

- 11:30-12:00 58 **PRYSTINE - Technical Progress After Year 1**
Norbert Druml
- 12:00-12:30 61 **GPU4S: Embedded GPUs in Space**
Leonidas Kosmidis, Jérôme Lachaize, Jaume Abella, Olivier Notebaert, Francisco J Cazorla and David Steenari
- 12:30-13:00 72 **The CASPER project approach towards user-centric mobile networks**
Eirini Liotou, Dimitris Tsolkas, Stefano Tennina, Luigi Pomante, Giorgos Kalpaktsoglou and Nikos Passas.

DSD-6

Room: Athinais

Chair: J. C. Ferreira

- 11:30-12:00 91 **Design of a SystemVerilog-based Sigma-Delta ADC Real Number Model**
Constantina Tsechelidou, Nikolaos Georgouloupoulos and Alkiviadis Hatzopoulos.
- 12:00-12:30 100 **Towards Formal Verification of Plans for Cognition-enabled Autonomous Robotic Agents**
Tim Meywerk, Marcel Walter, Vladimir Herdt, Daniel Grosse and Rolf Drechsler
- 12:30-13:00 105 **An open-source high-throughput, reduced memory footprint, face detection, pose estimation and landmark localization system**
Panagiotis Kalodimas, Antonis Nikitakis and Ioannis Papaefstathiou.

ASHWPA

Room: Theodora II

Chair: F.Leporati

- 14:30-15:00 42 **Smart Chair System for Posture Correction**
IonutDanci, Lengyel Karoly, Flutur George and Ovidiu Petru Stan
- 15:00-15:30 96 **An IoT-based Framework for Elderly Remote Monitoring**
Issam Boukhenoufa, Abbes Amira, Faycal Bensaali, Georgios Dimitrakopoulos, Chris Kotronis, Stelios Tsarsitalidis, Dimosthenis Anagnostopoulos, Mara Nikolaidou, Elena Polittie, Guillaume Alinier and Amine Bermak
- 15:30-16:00 137 **Optimization of CCOs with Implantable MEMS Pressure Sensors for Cardiovascular Applications**
Jose Ángel Miguel, Yolanda Lechuga, Miguel Ángel Allende and Mar Martínez
- 16:00-16:30 144 **Development of Cyber-physical Speech Controlled Wheelchair for Disabled Persons**
Andrej Škraba, Andrej Kolozvari, Davorin Kofjač, Prof. Radovan Stojanovic, Eugene Semenkin and Vladimir Stanovov
- 16:30-17:00 145 **Automatic and Unsupervised Identification of Specific Biochemical Features from Raman Mapping Data**
Emanuele Torti, Beatrice Marcinnò, Renzo Vanna, Carlo Morasso, Francesca Picotti, Laura Villani and Francesco Leporati

DSD-7**Room: Theodora I****Chair: G.Agosta**

- 14:30-15:00 62 **Improving Digital Circuit Simulation with Batch-Parallel Logic Evaluation**
Maria Patrou, Aaron Graham, Jean-Philippe Legault and Kenneth Kent.
- 15:00-15:30 71 **A mixed functionality development board geared towards digital systems design education**
Anastasios Fanariotis, Theofanis Orphanoudakis, Vasilis Fotopoulos and Paris Kitsos.
- 15:30-16:00 85 **The Conical-Fishbone Clock Tree: A Clock-Distribution Network for a Heterogeneous Chip Multiprocessor AI Chiplet**
Tomas Figliolia and Andreas Andreou.
- 16:00-16:30 90 **Combined Compression of Multiple Correlated Data Streams for Online-Diagnosis Systems**
Simon Meckel, Markus Lohrey, Seungbum Jo, Roman Obermaisser and Simon Plasger.

DTFT-1**Room: Athinais****Chair: Hana Kubátová**

- 14:30-15:00 78 **Accurate Inexact Calculations of Non-Homogeneous Markov Chains**
Jan Řezníček, Martin Kohlík and Hana Kubátová
- 15:00-15:30 119 **On Precise Fault Localization and Identification in NoC Architectures**
Martin Stava
- 15:30-16:00 134 **Local Monitoring of Embedded Applications and Devices using Artificial Neural Networks**
Fin Hendrik Bahnsen and Goerschwin Fey
- 16:00-16:30 135 **True Path Tracing in Structurally Synthesized BDDs for Controllability Analysis of Digital Circuits**
Raimund Ubar, Lembit Jürimägi, Adeniyi Adekoya and Maksim Jenihhin

16:30-17:00 POSTERS SESSION**ROOM: TBA****Chair: N. Konofaos/A.Zemva****17:00-17:30 Theodora I & II Keynote DSD: Muhammad Shafique****Chair: N.Konofaos**

19:00
Room: TBA
Social event

Friday 30th August

09:00-10:00 Theodora I & II Keynote SEAA: Alexander Chatzigeorgiou

Chair: L. Angelis

10:00-11:00 Theodora I & II Keynote DSD: Odysseas Koufopavlou

Chair: P.Kitsos

DTFT-2

Room: Athinais

Chair: P. Fizer

- 11:00-11:30 17 **Combinational Decompressors with Nonlinear Codes**
Ondrej Novak, Martin Rozkovec and Jan Pliva
- 11:30-12:00 26 **Testing Reliability of Smart Electronic Locks: Analysis and the First Steps Towards**
Ondrej Cekan, Jakub Podivinsky, Jakub Lojda, Richard Panek, Martin Krcma and Zdenek Kotasek
- 12:00-12:30 31 **Design of SRAM-based Low-Cost SEU Monitor for Self-Adaptive Multiprocessing Systems**
Junchao Chen, Marko Andjelkovic, Aleksandar Simevski, Yuanqing Li, Patryk Skoncej and Milos Krstic
- 12:30-13:00 39 **Scalable Simulation-based Verification of SystemC-based Virtual Prototypes**
Mehran Goli and Rolf Drechsler

DSD-8

Room: Theodora I

Chair: Robert Lorencz

- 11:00-11:30 107 **Design of Novel CMOS based Inexact Subtractors and Dividers for Approximate Computing: An In-Depth Comparison with PTL based Designs**
Chandan Kumar Jha and Joycee Mekie.
- 11:30-12:00 116 **Generating Efficient Parallel Code from the RVC-CAL Dataflow Language**
Omair Rafique, Klaus Schneider and Florian Krebs
- 12:00-12:30 126 **Novel Approximate Absolute Difference Hardware**
Ahmet Can Mert, Hasan Azgin, Ercan Kalali and IlkerHamzaoglu.
- 12:30-13:00 131 **An Efficient FPGA Implementation of Versatile Video Coding Intra Prediction**
Hasan Azgin, Ercan Kalali and Ilker Hamzaoglu.

MCSDIA

Room: Theodora II

Chair: Kim Grüttner

- 11:00-11:30 8 **Consideration of Security Attacks in the Design Space Exploration of Embedded Systems**
Lukas Gressl, Christian Steger and Ulrich Neffe
- 11:30-12:00 32 **An Approach for Detecting Power Peaks during Testing and Breaking Systematic Pathological Behavior**
David Trilla, Carles Hernandez, Jaume Abella and Francisco J Cazorla.
- 12:00-12:30 122 **Online Peak Power and Maximum Temperature Management in Multi-Core Mixed-Criticality Embedded Systems**
Behnaz Ranjbar, Tuan D. A. Nguyen, Alireza Ejlali and Akash Kumar
- 12:30-13:00 125 **HW/SW Co-Design Framework for Mixed-Criticality Embedded Systems considering Xtratum-based SW Partitions**
Luigi Pomante, Vittoriano Muttillio, Patricia Balbastre, Jose Simo and Alfons Creso

DSD-5**Room: Theodora II****Chair: A. Žemva**

- 14:30-15:00 3 **RetroFIT - Live Safety Monitoring for Safety-Critical Automotive Systems**
Andreas Strasser, Philipp Stelzer, Christian Steger and Norbert Druml
- 15:00-15:30 6 **Enabling Cognitive Autonomy on Small Drones by Efficient On-board Embedded Computing: An ORB-SLAM2 Case Study**
Erqian Tang, SobhanNiknam and Todor Stefanov
- 15:30-16:00 9 **EVC-based Power Gating Approach to Achieve Low-power and High Performance NoC**
Peng Wang, Sobhan Niknam, Sheng Ma, Zhiying Wang and Todor Stefanov.

EPDSD-2**Room: Theodora I****Chair: F. Loporati**

- 14:30-15:00 1 **The AFarCloud ECSEL Project**
Luigi Pomante, Pedro Castillejo, Baran Cürüklü, Roberto Fresco, Gorm Johansen, Sonia Bilbao Arechabala, Belen Martinez, José-Fernán Martínez-Ortega and Marco Santi
- 15:00-15:30 14 **Framework of key enabling technologies for safe and autonomous drones' applications**
Réda Nouacer, Huascar Espinoza, Yassine Ouhammou and Rodrigo Castiñeira González.
- 15:30-16:00 56 **Challenges in Deeply Heterogeneous High Performance Systems**
Giovanni Agosta, William Fornaciari, Alessandro Cilaro, José Flich Cardo, Carles Hernandez Luz, Michal Kulczewski, Giuseppe Massari, Rafael TorneroGavilá, Marina Zapater Sancho, David Atienza Alonso and Ramon Canal

DCPS-2/AHSA-4**Room: Athinais****Chair: : A Škraba**

- 14:30-15:00 142 **System Performance Modelling of Heterogeneous HW Platforms: An Automated Driving Case Study**
Falk Wurst, Dakshina Dasari, Arne Hamann and Dirk Ziegenbein
- 15:00-15:30 143 **On Analyzing Memory Latency for Real-Time Computing**
Selma Saidi
- 15:30-16:00 92 **CMOS Illumination Discloses Processed Data**
Jan Bělohoubek, Petr Fišer and Jan Schmidt

SDCIS**Room: Theodora I****Chair: E.S. Malki Ebeid**

- 16:30-17:00 70 **Structural Self-adaptation for Decentralized Pervasive Intelligence**
Jovan Nikolic and EvangelosPournaras
- 17:00-17:30 102 **System Design of an Open-Source Cloud-Based Framework for Internet of Drones Applications**
Golizheh Mehrooz, Emad Ebeid and Peter Schneider-Kamp
- 17:30-18:00 127 **A Survey on Multi-Unmanned Aerial Vehicle Communications for Autonomous Inspections**
Liping Shi, Nestor Marcano and Rune Jacobsen

AHSA-3**Room: Theodora II****Chair: Robert Lorencz**

- 16:30-17:00 103 **LAOCOÖN: A Run-time Monitoring and Verification Approach for Hardware Trojan Detection**
Jean-Luc Danger, Laurent Fribourg, Ulrich Kühne and MahaNaceur
- 17:00-17:30 117 **Dynamic Logic Reconfiguration Based Side-Channel Protection of AES and Serpent**
Petr Socha, Jan Brejník, Stanislav Jeřábek, Martin Novotný and NeleMentens
- 17:30-18:00 133 **Fault Isolation in Device Drivers and System Calls**
Maja Malenko and Marcel Baunach

18:00-18:30 CLOSING REMARKS**Room: TBA**

Work in Progress (Common Session with SEEA)

Room: Telemachus I

Chair: Karl-Erwin Grosspietsch

15:30-15:40 Towards Competency Change Framework for Software Engineers

Nana Assyne

15:40-15:50 Bringing MoVES Towards Consolidated Electrical/Electronic Automotive Architectures

Alessio Bucaioni, Saad Mubee

15:50-16:00 Security Engineering for Cyber Physical Systems

Peter Langendoerfer

16:00-16:10 Engineering of Resilient Crypto-Hardware: Balancing between FI and SCA Resistance

Zoya Dyka, IevgenKabin, Dan Klann, Peter Langendoerfer

16:10-16:20 Influence of Synopsys Design Compiler Options on the Success Horizontal DPA Attacks

Ievgen Kabin, Zoya Dyka, Dan Klann, Peter Langendoerfer

16:20-16:30 A New Approach to the Compact Models Parameters Extraction of High Reliability

Microelectronic Devices

Viktor Stempitsky, Ivan Lovshenko, Mikhail Kutas, Anatoly Belous, Vitaly Solodukha

16:30-16:40 Software Architecture for Autonomous UAVs for Power Line Inspection

Liping Shi, Nestor J. Hernandez Marcano, Rune Hylsberg Jacobsen, Golizheh Mehrooz, Emad

Ebeid, Peter Schneider-Kamp

16:40-16:50 Authentication and Secure Communication for Embedded Systems

Simona Buchovecka, Robert Lorencz, Jiri Bucek, Filip Kodytek

16:50-17:00 Configurable Fault Tolerant Circuits and System Level Integration for Self-Awareness

Raphael Segabinazzi Ferreira, Nevin George, Junchao Chen, Michael Hubner, Milos Krstic, Jorg

Nolte, Heinrich T. Vierhaus

POSTER SESSIONS

ALL POSTERS WILL BE DISPLAYED IN A SINGLE SESSION WHICH WILL REMAIN ON FOR TWO DAYS

Room: TBA

Wednesday, August 28th: 11:00-11:30 & 16:30-17:00 Posters set-up, display and discussions

Thursday, August 29th: 11:00-11:30 & 16:30-17:00 Posters display and discussions.

17:00 Poster session ends.

Friday, August 30th: No posters sessions.

Poster Sessions Chair: N.Konofaos

12	Armand Puccetti	The European H2020 project VESSEDIA (Verification Engineering of Safety and Security critical Dynamic Industrial Applications)
15	Mojtaba Haghi, Martijn Koedam, Dip Goswami and Kees Goossens	Model-based Processor-in-the-loop (PIL) Framework for Composable Multi-core platforms
24	Jakub Podivinsky, Ondrej Cekan, Martin Krcma, Radek Burget, Tomas Hruska and Zdenek Kotasek	Multidimensional Pareto Frontiers Intersection Determination and Processor Optimization Case Study
29	David Trilla, Carles Hernandez, Jaume Abella and Francisco J Cazorla	Modeling the Impact of Process Variations in Worst-Case Energy Consumption Estimation
34	Stefano Corda, Gagandeep Singh, Dr. Ahsan Javed Awan, Roel Jordans and Henk Corporaal.	PISA-NMC: Platform-Independent Software Analysis for Near-Memory Computing
36	Keerthikumara Devarajegowda, Lorenzo Servadei, Zhao Han, Michael Werner and Wolfgang Ecker	Formal Verification Methodology in an Industrial Setup
38	Fabian Vargas, Roger Goerl, Paulo Villa and Letícia Poehls	EDAC Approach for Handling Multiple Bit Upsets in Memory Array
43	Armin Schoenlieb, Matthias Almer, David Lugitsch, Christian Steger, Gerald Holweg and Norbert Druml	Coded Modulation Simulation Framework for Time-of-Flight Cameras
59	Sergiu Nimara	Reliability Assessment of Flooded Min-Sum LDPC Decoders Based on Sub-Threshold Processing Units
60	Lampros Pyrgas and Paris Kitsos	A Very Compact Architecture of CLEFIA Block Cipher for Secure IoT Systems
63	Ayaz Akram and Lina Sawalha	A Study of Performance and Power Consumption Differences Among Different ISAs
68	Martin Jureček, Jiří Buček and Róbert Lórencz	Side-Channel Attack on the A5/1 Stream Cipher
73	Oliver Schrape, Anselm Breitenreiter, Steffen Zeidler and Milos Krstic	Aspects on Timing Modeling of Radiation-Hardness by Design Standard Cell-Based Δ TMR Flip-Flops
83	NusratLisa, TuanNguyen	High-Throughput Bit Packing Compression
106	Bahareh Khabbazan and Sattar Mirzakuchaki.	Design and Implementation of a Low-power, Embedded CNN Accelerator on a Low-end FPGA
112	Mahsa Mousavi, Sayandip De, Hamidreza Pourshaghghi and Henk Corporaal	Fault Tolerant FPGAs: where to spend the effort?
118	Javier Soto, Thomas Krohmer, Cecilia Hernandez and Miguel Figueroa	Hardware acceleration of k-mer clustering using locality-sensitive hashing
120	Sebastian Vogel, Rajatha Beligere Raghunath, Andre Guntoro, Kristof Van Laerhoven and Gerd Ascheid.	Bit-shift based Accelerator for CNNs with Selectable Accuracy and Throughput
123	Ansh Rupani, Shubham Rai and Akash Kumar.	Exploiting Emerging Reconfigurable Technologies for Secure Devices
128	Behrad Niazmand, Siavoosh Payandeh Azad, Gert Jervan and Johanna Sepulveda	Design and Verification of Secure Cache Wrapper against Access-driven Side-Channel Attacks
138	Dharshan Krishna Murthy, Mingqing Zhang and Alejandro Masrur	Analyzing the Impact of Secure CAN Networks on Braking Dynamics of Cooperative Driving