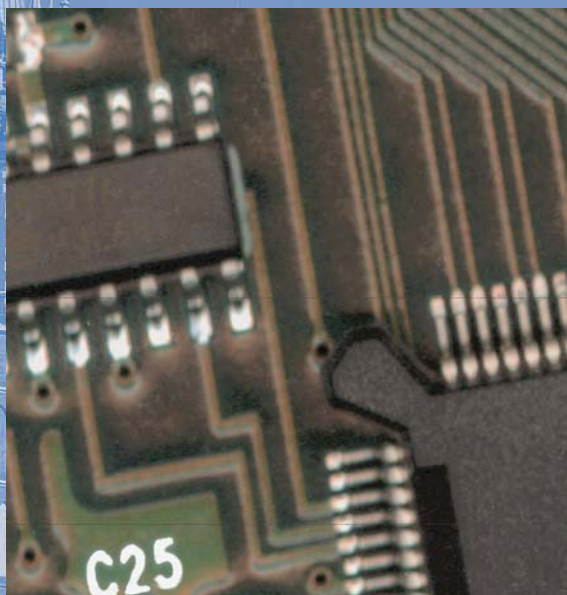


# FINAL PROGRAMME

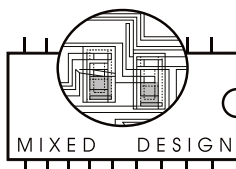
30<sup>th</sup> International Conference



# MIXDES 2023


MIXED DESIGN OF INTEGRATED  
CIRCUITS AND SYSTEMS

Kraków Poland  
29 - 30 June, 2023



# 30<sup>th</sup> International Conference MIXED DESIGN OF INTEGRATED CIRCUITS AND SYSTEMS Kraków, Poland, 29-30 June 2023

## MIXDES 2023 Timetable

Day 1	Thursday, June 29 <sup>th</sup> , 2023		
	Room A	Room B	Room C
8:15	Conference Opening		
8:30	Plenary Session I		
9:50	Session 1 (Part 1)	Session 5	Session 7
11:10	Coffee Break		
11:30	Session 1 (Part 2)	Session 6 (Part 1)	Special Session 3
13:00	Lunch		
14:00	Session 1 (Part 3) & 2	Session 6 (Part 2) & 8	Special Session 2
15:30			IEEE ED Poland Meeting
19:00	 Welcome Party (sponsored by Silicon Creations)		

Day 2	Friday, June 30 <sup>th</sup> , 2023		
	Room A	Room B	Room C
8:15	Plenary Session II		
9:30	Session 1 (Part 4)	Session 3 (Part 1)	Special Session 1 (Part 1)
11:00	Coffee Break		
11:30	Session 4	Session 3 (Part 2)	Special Session 1 (Part 2)
13:00	Lunch		
14:00	Tourist Activities		Special Session 1 (Part 3)
15:30			Coffee Break
16:00			Special Session 1 (Part 4)
19:00	Closing Ceremony		

Publikacja dofinansowana ze środków budżetu państwa w ramach programu Ministra Edukacji i Nauki pod nazwą „Doskonała Nauka”, nr projektu DNK/SP/547594/2022, kwota dofinansowania 99 000,00 złotych, całkowita wartość projektu 202 000,00 złotych.

## **WELCOME TO MIXDES 2023**

This year the International Conference "Mixed Design of Integrated Circuits and Systems" celebrates its 30<sup>th</sup> anniversary edition. For the past twenty nine years the conference has been a unique forum for promoting different approaches to mixed VLSI design and an esteemed venue for presenting multidisciplinary research. This year we meet together in Kraków, one of the oldest cities in Poland.

MIXDES 2023 consists of plenary lectures, regular and special sessions focusing on recent trends and advances on all aspects of main conference topics, reviewed and selected from all submissions from 22 countries. During the plenary lectures, the following 4 invited papers will be presented:

- *1 Selector - 1 Resistor (1S1R) Crossbar Arrays for Neural Networks Hardware Implementation*  
Joel Minguet Lopez (CEA, LETI, MINATEC Campus, Grenoble, France)
- *Design, Analysis, Fabrication and Dynamic Testing of Insect-inspired Nano Air Vehicles*  
Sébastien Grondel (Univ. Polytechnique Hauts-de-France, CNRS, Univ. Lille, France)
- *From Embedded to Cyber-physical Systems, AI and Beyond*  
Nikolaos Voros (University of Peloponnese, Greece)
- *Noise-Based Simulation Approach for Statistical Analysis of Parameter Fluctuations in Circuits*  
Alexander Kloes (THM University of Applied Sciences, Germany)

The program includes 3 special sessions, aiming at complementing the regular program with emerging topics of interest to the circuit design community:

- *Compact Modeling of Micro- and Nanoelectronic Devices and Systems with Support for Free Open Source PDK Initiative*
- *GaN-based Devices*
- *Offshore Wind Farm Energy & Power Cables*

The organisers would like to thank all the distinguished scientists who have supported the conference by taking part in the International Programme Committee and reviewing the contributed papers.

We hope that you will enjoy your visit to Kraków and for the next year we invite you for the first time in MIXDES history to Gdańsk, the beautiful port city in Poland.

Yours Sincerely,  
MIXDES 2023 Organising Committee

## ORGANIZED BY

Department of Microelectronics and Computer Science,  
Lodz University of Technology, Poland

Faculty of Computer Science, Electronics and Telecommunications,  
AGH University of Science and Technology, Poland

Institute of Microelectronics and Optoelectronics,  
Warsaw University of Technology, Poland

## IN COOPERATION WITH

Poland Section IEEE - ED & CAS Chapter

Section of Microelectronics and Electron Technology  
of the Committee of Electronics and Telecommunication  
of the Polish Academy of Sciences

Commission of Electronics and Photonics  
of Polish National Committee of International Union of Radio Science - URSI

Silicon Creations Poland - Vendor of PLLs/OSC  
and Multiprotocol SERDES based in Kraków

Cadence Design Systems

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Mayor of the City of Krakow, Prof. Jacek Majchrowski (Honorary Patronage)

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**cadence**<sup>®</sup>



## PROGRAMME COMMITTEE

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Prof. J. Zarębski	Gdynia Maritime Academy, Poland
Prof. M. Zubert	Lodz University of Technology, Poland

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Dr. P. Bratek	Electronics and Telecommunications,
Dr. I. Brzozowski	AGH University of Science and Technology, Poland
Prof. W. Kuźmicz	Institute of Micro- and Optoelectronics, Warsaw University of Technology, Poland

## MAIN TOPICS

- 1. Design of Integrated Circuits and Microsystems**  
Design methodologies. Digital and analog synthesis. Hardware-software codesign. Reconfigurable hardware. Hardware description languages. Intellectual property-based design. Design reuse.
- 2. Analysis and Modelling of ICs and Microsystems**  
Simulation methods and algorithms. Behavioural modelling with VHDL-AMS and other advanced modelling languages. Microsystems modelling. Model reduction. Parameter identification.
- 3. Testing and Reliability**  
Design for testability and manufacturability. Measurement instruments and techniques.
- 4. Power Electronics**  
Design, manufacturing, and simulation of power semiconductor devices. Hybrid and monolithic Smart Power circuits. Power integration.
- 3. Signal Processing**  
Digital and analog filters, telecommunication circuits. Neural networks. Artificial intelligence. Fuzzy logic. Low voltage and low power solutions.
- 4. Embedded Systems**  
Design, verification and applications.
- 5. Medical Applications**  
Medical and biotechnology applications. Thermography in medicine.



## CONFERENCE CENTER

The conference will take place in:

**Institute of Computer Science  
of AGH University of Science and Technology**  
21 Kawory Street  
30-055 Kraków



Conference Site

## ACCOMMODATION

The accommodation will be offered for the conference participants at various hotels near conference site Kraków city centre. Please note that the MIXDES 2023 Conference participants reserve the hotel rooms on their own.

- **Hotel Kossak \*\*\*\*** (1 Kossaka Square)  
Walking distance to conference site: 26 min  
Contact +48 12 379 59 00; [kossak@hotelkossak.pl](mailto:kossak@hotelkossak.pl)
- **Hotel Grand Ascot \*\*\*\*** (4 Szujskiego Street)  
Walking distance to conference site: 18 min  
Contact: [rezerwacja@grandascot.pl](mailto:rezerwacja@grandascot.pl)
- **Hotel Polonez \*\*\*** (15 Reymonta Street)  
Walking distance to conference site: 7 min  
Contact: [repcja@hotel-polonez.pl](mailto:repcja@hotel-polonez.pl)
- **Hotel Logos \*\*\*** (5 Szujskiego Street)  
Walking distance to conference site: 18 min  
Contact: [agnieszka.urbanczyk@hotel-logos.pl](mailto:agnieszka.urbanczyk@hotel-logos.pl)
- **Antica Residence \*\*\*** (76 Czarnowiejska Street)  
Walking distance to conference site: 3 min  
Contact: [repcja@anticaresidence.pl](mailto:repcja@anticaresidence.pl)
- **Jordan Guest Rooms \*\*** (9 Długa Street)  
Walking distance to conference site: 28 min  
Contact: [jordanpokoje@jordan.pl](mailto:jordanpokoje@jordan.pl)



Kossak



Grand Ascot



Polonez



Logos



Antica Res.



Jordan

## REGISTRATION

The standard conference registration fee includes the admission to the conference, a copy of the Book of Abstracts, Conference Proceedings CD-ROM and other conference materials, tourist activities, all lunches, the welcome party, the banquet, coffee and tea during the breaks. To encourage students to participate in the Conference, the student registration fee is available.

The Book of Abstract and other conference materials will be distributed to participants at the registration desk. The Conference Proceedings CD-ROM will be distributed to the participants after the conference.

The registration desk will be located in the conference center. It will be working during the following hours:

29 June (Thursday)	07:30 – 13:00 h, 14:00 – 17:00 h
30 June (Friday)	08:00 – 13:00 h

## GENERAL INFORMATION AND INQUIRIES

Dr. Mariusz Orlikowski

Lodz University of Technology

Department of Microelectronics and Computer Science

ul. Wólczajska 221 (building B18), 93-005 Łódź, Poland

e-mail: [mixdes2023@dmcs.p.lodz.pl](mailto:mixdes2023@dmcs.p.lodz.pl)

tel.: +48 604397239

www: <http://www.mixdes.org>

fax: +48 426360327

## THE CITY OF KRAKÓW

Kraków (Cracow) is the second-largest and one of the oldest cities in Poland dating back to the seventh century. Kraków was the official capital of Poland until 1596 and has traditionally been one of the leading centres of Polish academic, economic, cultural and artistic life. Its Old Town with Wawel Royal Castle was declared the first UNESCO World Heritage Site in the world.

Kraków is a legendary city full of historical monuments and relics and, at the same time, aspiring to catch up with contemporary times and to merge the past with the 21<sup>st</sup> century. The city is an unquestioned tourist center. The location of the conference allows you to get in a few minutes to the Old Market Square, to the Gothic and Baroque churches, museums, the Royal Castle, former Jewish Kazimierz District, and a multitude of cafes, restaurants and stores.

For more information see:

<http://www.krakow.travel/en/>

<http://infokrakow.pl/en/>



## **TOURIST ACTIVITIES**

For over a thousand years, Kraków has been the centre of science, culture and art in Poland and our city sightseeing tour is a fine introduction to this historical city.

The city is renowned for its numerous old churches, including the Gothic St. Mary's Church famous for its medieval wooden altar carved by Wit Stwosz. The Main Market Square is an unusual place, delineated in the 13<sup>th</sup> century and is still one of the biggest market squares in Europe (200 m x 200 m).

The center of the square is dominated by the Renaissance Cloth Hall. In the past centuries it served as a major center of international trade, now it hosts a branch of the National Museum with an exhibition of the Gallery of Polish Paintings.

The city fortification system was built in the 14<sup>th</sup> century and parts of the walls have survived to this day with defensive Medieval structures – the Barbican and St. Florian's Gate. The Royal Castle and cathedral on the Wawel Hill were the coronation and burial places of Polish kings and queens. The Renaissance castle boasts a beautiful arcaded courtyard, magnificent interiors and famous Flemish tapestries.

Our tour begins with a short walk along the streets lead around the Main Market Square of Kraków and to followed us directly to the Square and to the twin-spired St. Mary's Church with its famous medieval altar by Wit Stwosz where, every hour, the trumpeter of Krakow still calls out his warning.

Along the Royal Route we will walk to the Palace of Princes Czartoryski Museum which hosts a valuable art collection in Poland and one of the most valuable ones in Europe. We will listen to an amazing history of one of the mysterious masterpieces of Leonardo da Vinci's „Lady with an Ermine". On our list of valuable masterpieces to admire are also: Landscape with the Good Samaritan - Rembrandt van Rijn and other works of paintings, sculptures, crafts, military or applied arts - an immense collection of souvenirs presenting a history of our country. The tour will end at the Main Market Square, where you may return to the hotel and/or follow to Blessed Jacob hall of Franciscan monastery for the conference banquet.

## **TRANSPORT**

Kraków can be reached by train or road, you can also use Kraków Airport connecting the city with many of European destinations (see <https://krakowairport.pl/en>). Krakow Airport is served by three public transport bus lines: 209 and 300 and one night line: 902 (zone II tickets apply). Kraków may also be reached by taxi which may be ordered on-line (see <https://krktaxi.pl/>). If you plan travelling to Kraków by train please go to <https://rozkład-pkp.pl/en> for up-to-date train availability and purchasing the tickets.

## MIXDES 2023

To move around Kraków you can use the city public transport. Tickets are valid for the specific period of time - in case of change one does not have to use second ticket, except for the single fare tickets (for additional information about public transport see <https://ztp.krakow.pl/en/public-transport/kmk-public-transport>). The trip may be planned using Google Maps.

Ticket type	Zone	Ticket fares (PLN)	
		Full fare	Reduced fare
20-minute	I + II + III	4.00	2.00
60-minute/single trip	I + II + III	6.00	3.00
90-minute	I + II + III	8.00	4.00
24-hour	I	17.00	8.50
	I + II + III	22.00	11.00
48-hour	I + II + III	35.00	17.50
72-hour	I + II + III	50.00	25.00

If you plan using taxi to travel in Kraków, we recommend using corporate taxis, which may be requested by phone call:

- ICAR Taxi  
<https://icartaxi.eu/>  
phones: +48 12 653 5555 or +48 12 888 0000
- MegaTaxi  
<https://megataxi.pl/>  
phones: +48 (12) 196 25, +48 124 000 000 or 48 124 124 124

UBER and BOLT also operates in Kraków can be ordered via dedicated applications.

## PROGRAMME OF THE CONFERENCE

The programme of the MIXDES 2023 Conference will include oral presentations of contributed and invited papers and special sessions.

Except for the plenary sessions, the programme of the conference will be divided into three parallel sessions, in accordance with discussed topics. The language of the Conference is English, neither translation nor interpretation will be provided.

### The time of oral presentations:

- for invited papers: 20-25 min. for presentation and 5-10 min. for questions,
- for regular papers: 15 min. for presentation and 5 min. for questions.

### Lunches:

Lunches will be served each day at the conference center at the times indicated in the programme.

**Welcome Party and Conference Banquet:**

The Welcome Party will be organised on Thursday (the first conference day) at 19:00 in Cafe Oranzeria Restaurant (Kossak Square 1). It is located in the roof of the Kossak Hotel with beautiful view of the Wawel Hill, the Old Town and the Vistula Boulevards.

The Conference Banquet and the Closing Ceremony will take place on Friday at 19:00 in Blessed Jacob hall of Franciscan monastery (Franciszkańska 4 Street).

**IMPORTANT PHONE NUMBERS**

Ambulance	999	Fire Brigade	998
Police	997	Emergency phone	112

**BANKING**

Foreign exchange facilities are available at major airports and at larger hotels, as well as in many private offices, called "Kantor". Credit cards can be used in most of the places such as banks, hotels, car-rental offices, restaurants, and shops. Approximate currency exchange rate: 1 € = 4.48 PLN, 1 \$ = 4.14 PLN (for the up-to-date information refer to <http://www.nbp.pl>).

**Credit cards:**

Visa and MasterCard are the most common cards. However, other cards might be accepted.

**Currency:**

Generally, everywhere in Poland you pay in Polish zlotys. The currency units are złoty (zł, PLN) and grosz (gr), 1 zł = 100 gr. The Polish zloty is a fully convertible currency internally in Poland.

**WEATHER**

June in Poland is generally sunny, with some showers, the temperatures can be typically 15 to 28 °C during days. During nights, the temperature can go down to 8-10 °C. So, we can suggest you to bring summer clothes, with a quite warm jacket or pullover, and an umbrella.

**Time****Room A****08:15 Conference Opening**

Chairmen: Prof. Wojciech Tylmam, Prof. Andrzej Pfitzner and Prof. Gilbert De Mey

**08:30 Plenary Session I**

Chairman: Prof. Andrzej Pfitzner

*Design, Analysis, Fabrication and Dynamic Testing of Insect-inspired Nano Air Vehicles*

S. Grondel (Univ. Polytechnique Hauts-de-France, France), M. de la Bigne, A. Itawi (Univ. Polytechnique Hauts-de-France and Arts et Métiers, France), M. Zwingelstein, S. Ghenna, C. Soyer, E. Cattani (Univ. Polytechnique Hauts-de-France, France), O. Thomas (Arts et Métiers, France)

*Noise-Based Simulation Approach For Statistical Analysis of Parameter Fluctuations in Circuits*

A. Kloes (THM Univ. of Applied Sciences, Germany), A. Nikolaou (THM Univ. of Applied Sciences, Germany and Univ. Rovira i Virgili, Spain), N. Dersch (THM Univ. of Applied Sciences, Germany), C. Roemer (THM Univ. of Applied Sciences, Germany and Univ. Rovira i Virgili, Spain), G. Darbandy, M. Schwarz (THM Univ. of Applied Sciences, Germany)

*Clocking & Interfacing IP Towards the Ångström Era (vendor presentation)*

P. Banachowicz (Silicon Creations, Poland)

**09:50 Session 1 (Part 1): Design of Integrated Circuits and Microsystems**

Chairman: Prof. Witold Pleskacz

*A 0.18  $\mu\text{m}$  CMOS Integrated Optical Wireless Power Transfer System for Implantable Biomedical Devices*

G. Di Patrizio Stanchieri, A. De Marcellis, M. Faccio, E. Palange (Univ. of L'Aquila, Italy), U. Guler (Worcester Polytechnic Inst., USA)

*A 30 kHz - 3 GHz Clock Duty-Cycle Corrector Circuit for CMOS Integrated Digital Electronic Systems*

G. Di Patrizio Stanchieri, A. De Marcellis, M. Faccio, E. Palange (Univ. of L'Aquila, Italy), O. Aiello (Univ. of Genoa, Italy)

*A Hardware Design Generator of High-Performance FIFO-based Linear Insertion Streaming Sorters*

M.L. Petrović, V.M. Milovanović (Univ. Kragujevac and NOVELIC, Serbia)

*A New Continuous Time Offset and Gain Calibration Strategy for Open-loop Residue Amplifiers of ADC*

M. Ghasemzadeh (Urmia Univ., Iran), D. Makarem (Politecnica de Madrid, Spain)

**13:00 Coffee Break****11:30 Session 1 (Part 2): Design of Integrated Circuits and Microsystems**

Chairman: Prof. Wiesław Kuźmicz

*An Adaptive Resolution Level-Crossing Analog-to-Digital Converter for Biomedical Signal Acquisition*

D. Makarem (Politecnica de Madrid, Spain), M. Ghasemzadeh (Urmia Univ., Iran)

*Automatic Design of a Cascoded-Inverter-Based Charge-Sensitive Amplifier Using  $g_m/I_D$  Technique and Particle Swarm Optimization in 28 nm CMOS*

P. Kaczmarczyk (AGH Univ. of Science and Techn. in Krakow, Poland)

*Compensation of Temperature Nonlinearity in a Zener-Based Voltage Reference*

V. Bucur, G. Banarie (Analog Devices International, Ireland), S. Marinca (Tech. Univ. of Cluj-Napoca, Romania)

*Data Extraction and Preparation for AI Inference in a Distributed Computation Load Based FPGA Design*

C.S. Ibala (Intel, Oregon, USA), J.G. de la Mora (Intel, Jalisco, Mexico), A. Muralidharan (Intel, San Jose CA, USA), C.Y. Tan Lee (Intel, Penang, Malaysia)

**13:00 Lunch****14:00 Session 1 (Part 3) & Session 2: Design of Integrated Circuits and Microsystems & Thermal Issues in Microelectronics**

Chairman: Prof. Andrzej Pfitzner

*Design and Implementation of Integrated Circuits Using Open Source Tools and SKY130 Free PDK*

K. Herman (UBB, Chile), M. Montanares (University of Concepcion, Chile), J. Marin (Univ. Tecnica Federico Santa Maria, Chile)

*Design of the Slope Detection Circuit for On-Chip Current Sensing*

R. Ravasz, D. Maljar, D. Arbet, V. Stopjakova, P. Kubinec (Slovak Univ. of Techn., Slovakia)

*Experimental Results with a 10 kW<sub>p</sub> Photovoltaic Installation in a Private Property*

G. De Mey, G. Scheire (Univ. of Ghent, Belgium)

*Preliminary Characterization of an Electro-Thermal Converter*

M. Janicki, M. Jankowski, M. Szermer (Lodz Univ. of Techn., Poland)

**19:00 Welcome Party** (sponsored by Silicon Creations)

**Time****Room B****09:50 Session 5: Power Electronics**

Chairman: Prof. Marcin Janicki

*Comparison of Methods for Thermal Parameters Measurements of an Air Transformer*

K. Detka, K. Górecki (Gdynia Maritime Univ., Poland)

*Full-SiC Single-Chip Buck and Boost MOSFET-JBS Converters for Ultimate Efficient Power Vertical Integration*

R. Makhoul (LAAS-CNRS Toulouse and Ampere INSA Lyon, France), A. Bourennane (LAAS-CNRS Toulouse, France), L.V. Phung (Ampere INSA Lyon, France), F. Richardeau (LAPLACE Toulouse, France), M. Lazar, N. Beydoun, S. Kostcheev (Technological Univ. of Troyes, France), P. Godignon (IMB-CNM Barcelona, Spain), D. Planson, H. Morel (Ampere INSA Lyon, France), D. Bourrier (LAAS-CNRS Toulouse, France)

*Investigations on an Influence of Selected Factors on Thermal Phenomena in Planar Transformers*

K. Górecki, P. Kuryłło (Gdynia Maritime Univ., Poland)

*On the Electro-Thermal 2D FEM Parametric Analysis of SiC Vertical MOSFET Including Gate-Oxide Charge-Trapping Thermal Dependency. Application for Fast Transient Extreme Short-Circuit Operation*

T. Cazimajou, E. Sarraute, F. Richardeau (LAPLACE, Univ. de Toulouse, CNRS, INPT, UPS. Toulouse, France)

**11:10 Coffee Break****11:30 Session 6 (Part 1): Signal Processing**

Chairman: Prof. Wojciech Tylman

*Analysis of Optimum Switching Points for Hybrid Adaptive Technique under Rayleigh Fading Channels*

S. Bandiri (UNILAB, Brazil), S. Diakite (Inst. des Sciences Appliquées, Mali), T. Pimenta (Univ. Federal de Itajuba, Brazil)

*Detection of Unoccupied Areas of the Road in Images from Mono Camera with Use of Multilevel Image Decomposition*

P. Bogacki (Aptiv Services, Poland), Z. Długosz (Bydgoszcz Univ. of Science and Techn., Poland), M. Banach (Aptiv Services and Poznan Univ. of Techn., Poland), T. Talaśka (Bydgoszcz Univ. of Science and Techn., Poland), R. Długosz (Aptiv Services and Bydgoszcz Univ. of Science and Techn., Poland)

*Machine Learning Approach for Multi Particle Tracking in Complex Plasmas*  
N. Dormagen, M. Klein (THM Univ. of Applied Sciences and Justus Liebig Univ., Germany), M.H. Thoma (Justus Liebig Univ., Germany), M. Schwarz (THM Univ. of Applied Sciences, Germany)

*Solutions for Creating Virtual Tracks for Autonomous Vehicles, Based on Vehicle-to-Infrastructure Technology*

M. Banach (Poznan Univ. of Techn. and Aptiv Services, Poland), P. Bogacki (Aptiv Services, Poland), Z. Długosz, T. Talaśka (Bydgoszcz Univ. of Science and Techn., Poland), R. Długosz (Aptiv Services and Bydgoszcz Univ. of Science and Techn., Poland)

**13:00 Lunch****14:00 Session 6 (Part 2) & Session 8: Signal Processing & Medical Applications**

Chairman: Prof. Witold Pleskacz

*Steganographic Stream Cipher Encryption Using True Random Number Generator*

J.J. Tatarkiewicz, W. Kuźmich (RANDAEMON sp. z o.o., Poland)

*Non-invasive Bioimpedance Spectroscopy Device Performing Periodic Measurements of Chest Hydration - Model Development*

M. Urzeniczok, A. Michnik (Łukasiewicz Research Network - Krakow Inst. of Techn. and Silesian Univ. of Techn., Gliwice, Poland), K. Pilarski, I. Karpiel (Łukasiewicz Research Network - Krakow Inst. of Techn., Poland)

*The Use of an Inductive Sensor in the Assessment of Respiratory System Performance During Exercise - Preliminary Study*

I. Karpiel, K. Olesz, M. Mysiński (Łukasiewicz Research Network - Krakow Inst. of Techn., Poland), M. Urzeniczok (Łukasiewicz Research Network - Krakow Inst. of Techn. and Silesian Univ. of Techn., Zabrze, Poland), D. Feige (Łukasiewicz Research Network - Krakow Inst. of Techn. and Silesian Univ. of Techn., Gliwice, Poland), M. Palus, A. Sobotnicki (Łukasiewicz Research Network - Krakow Inst. of Techn., Poland), M. Czerw (Łukasiewicz Research Network - Krakow Inst. of Techn. and Silesian Univ. of Techn., Zabrze, Poland)

**19:00 Welcome Party (sponsored by Silicon Creations)**



**Time****Room C****09:50 Session 7: Embedded Systems**

Chairman: Prof. Paweł Gryboś

*A Method for Implementing a SHA256 Hardware Accelerator inside a Quantum True Random Number Generator (QTRNG)*

K. Witek (AGH Univ. of Science and Techn. in Krakow, Poland), M. Caccia (Univ. degli Studi dell'Insubria, Italy), W. Kucewicz, M. Baszczyk, P. Dorosz (AGH Univ. of Science and Techn. in Krakow, Poland), Ł. Mik (Univ. of Applied Sciences in Tarnow, Poland)

*Acceleration of Electromagnetic Simulations on Reconfigurable FPGA Card*

T. Topa, A. Noga (Silesian Univ. of Techn., Gliwice, Poland), T. Stefanski (Gdansk Univ. of Techn., Poland)

*Optimization of Signal Dispersion Space in Tropospheric BLOS Communications*

A. Lewandowski (Zakład Doskonalenia Zawodowego, Poland)

*Study and Application of the IO-Link Industrial Network in the Context of Industry 4.0*

H. Gonzaga (Univ. Federal de Itajubá, Brazil), T. Pimenta (Univ. Federal de Itajuba, Brazil)

**11:10 Coffee Break****11:30 Special Session 3: GaN-based Devices**

Chairman: Dr. Anna Szerling

*Vertical and Lateral GaN-based Devices for Power Electronics*

A. Taube (Łukasiewicz - IMIF, Poland), M. Kamiński (Łukasiewicz - IMIF and Warsaw Univ. of Techn., Poland), M. Ekielski (Łukasiewicz - IMIF, Poland), J. Tarenko, O. Sadowski (Łukasiewicz - IMIF and Warsaw Univ. of Techn., Poland), K. Pągowska, K. Kosielski, R. Kruska, M. Zadura, E. Brzozowski (Łukasiewicz - IMIF, Poland), R. Kisiel (Warsaw Univ. of Techn., Poland), P. Prystawko, M. Boćkowski, I. Grzegory (IWC PAN, Poland), A. Szerling (Łukasiewicz - IMIF, Poland)

*Magnesium Ion Implantation - Key Technology for GaN Power Electronics*

K. Sierakowski, P. Jaroszyński, M. Iwińska, T. Sochacki, M. Boćkowski, R. Jakiela (Polish Academy of Sciences, Poland), M. Turek (Maria Curie-Skłodowska Univ. in Lublin, Poland)

*Nitride Laser Diodes and Nitride-based Photonics Integrated Circuits for Quantum Technologies and Sensing Applications*

P. Perlin, A. Kafar, L. Marona, S. Grzanka, S. Stańczyk, M. Aktas (IWC PAN, Poland)

*Supersymmetric Single Lateral Mode GaN-based Edge-emitting Lasers*

Ł. Piskorski, T. Czyszanowski (Lodz University of Technology, Poland)

**13:00 Lunch****14:00 Special Session 2: Compact modeling of Micro- and Nanoelectronic Devices and Systems**

Chairman: Dr. Daniel Tomaszewski

*Comparison Between WKB and Wavelet Approach for Analytical Calculation of Tunneling Currents in Schottky Barrier Field-Effect Transistors*

A. Kloes, M. Schwarz (THM Univ. of Applied Sciences, Germany), Y. Han, Q.-T. Zhao (Forschungszentrum Jülich, Germany), C. Roemer (THM Univ. of Applied Sciences, Germany and Univ. Rovira i Virgili, Spain)

*Modeling of THz Detection in JLFETs - A Comparative Study*

D. Tomaszewski, M. Zaborowski, J. Marczewski (Łukasiewicz - Inst. of Microelectronics and Photonics, Poland), P. Bajurko (Warsaw Univ. of Techn., Poland)

*Simulation and Modeling of Silicon Semiconductor Devices and Sensors*

M. Schwarz, G. Darbandy (THM Univ. of Applied Sciences, Germany), C. Römer, N. Dersch (THM Univ. of Applied Sciences, Germany and Univ. Rovira i Virgili, Spain), A. Kloes (THM Univ. of Applied Sciences, Germany)

*Nonlinear Thermal Models of Electronic Components*

K. Górecki, K. Detka, P. Górecki, P. Ptak (Gdynia Maritime Univ., Poland)

**15:30 IEEE ED Poland Meeting****19:00 Welcome Party** (sponsored by Silicon Creations)

**Time****Room A****08:15 Plenary Session II**

Chairman: Prof. Wojciech Tylman

*Cadence Design Services as a Way to Reduce Risk (vendor presentation)*  
M. Bersiński (Cadence Design Systems Poland)

*From Embedded to Cyber-physical Systems, AI and Beyond*  
N. Voros (Univ. Peloponnese, Greece)

*1 Selector - 1 Resistor (1S1R) Crossbar Arrays for Neural Networks Hardware Implementation*

J. Minguet Lopez, M. Dampfhofer, T. Hirtzlin, L. Reganaz, L. Grenouillet, G. Navarro, M. Bernard, T. Magis, C. Carabasse, N. Castellani, V. Meli, E. Vianello (CEA, LETI, MINATEC Campus, Grenoble, France), D. Deleruyelle (Aix Marseille Univ., Univ. de Toulon, CNRS, IM2NP, Marseille, France), J. Portal (INL CNRS, INSA Lyon, France), G. Molas (Weebit Nano Ltd., France), F. Andrieu (CEA, LETI, MINATEC Campus, Grenoble, France)

**09:30 Session 1 (Part 4): Design of Integrated Circuits and Microsystems**

Chairman: Prof. Wojciech Tylman

*Design, Verification and Testing of a Readout Integrated Circuit for Hybrid Pixel X-ray Detectors with in-Pixel Time Measurement Functionality in 28 nm CMOS*

L.A. Kadlubowski (AGH Univ. of Science and Techn. in Krakow, Poland)

*Dual TDL Based Phase Difference Detector Architecture*

A. Wojciechowski (Warsaw Univ. of Techn., Poland), K. Marcinek (ChipCraft Sp. z o.o., Poland), W. Pleskacz (Warsaw Univ. of Techn., Poland)

*Successful Selection of the SoC Clocking Architecture*

K. Kasiński (AGH Univ. of Science and Techn. in Krakow and Silicon Creations sp. z o.o., Poland), D. Ziółkowski, P. Banachowicz, J. Iwanicka (Silicon Creations sp. z o.o., Poland)

**11:00 Coffee Break****11:30 Session 4: Testing and Reliability**

Chairman: Prof. Andrzej Pfitzner

*Ethernet-based In-System Testing and Utilization of IP Cores Implemented on FPGA Development Kits*

V.D. Damnjanović (Univ. of Belgrade and NOVELIC, Serbia), V.M. Milovanović (Univ. of Kragujevac and NOVELIC, Serbia)

*Hardened Processor Architecture*

J. Mach, L. Kohútka, P. Čičák (Slovak Univ. of Techn., Slovakia)

*Investigations on Properties of a Laboratory System for Wireless Power Transfer*

P. Ptak, K. Górecki, G. Stankiewicz (Gdynia Maritime Univ., Poland)

**13:00 Lunch**

**14:00 Tourist Activities**

**19:00 Closing Ceremony**

**Time****Room B****09:30 Session 3 (Part 1): Analysis and Modelling of ICs and Microsystems**

Chairman: Prof. Krzysztof Górecki

*An Analysis of the Performance of an Artificial Immune Approach to Detecting Infections in Computer Programs*

P. Widulinski, K. Wawryn (Koszalin Univ. of Techn., Poland)

*Behavioral I-V Model for Nanometer MOSFETs*

A. Gołda (Vtool, Poland)

*Development of a C-Band Multi-Stage Solid State Power Amplifier for 200 W Continuous Wave Output*

A. Lewandowski (Zakład Doskonalenia Zawodowego, Poland), J. Sorocki (AGH Univ. of Science and Techn. in Krakow, Poland)

*Development of Self-Limiting LC Oscillators Using Cascade Structure of Monolithic CCIIIs*

I. Pandiev (Tech. Univ. Sofia, Bulgaria)

**11:00 Coffee Break****11:30 Session 3 (Part 2): Analysis and Modelling of ICs and Microsystems**

Chairman: Prof. Gilbert De Mey

*Methods for Decomposition of Conjunctive Formulas in Algebra of Finite Predicates*

G. Chetverikov, I. Shubin, I. Sykal, I. Tabakova (Kharkiv National Univ. of Radio Electronics, Ukraine)

*Power Analysis Attacks on the Customizable MK-3 Authenticated Encryption Algorithm*

P. Fabinski (Rochester Inst. of Techn., USA), S. Farris, M. Kurdziel (L3Harris Techn., USA), M. Łukowiak, S. Radziszowski (Rochester Inst. of Techn., USA)

*Temperature Power Factor Influence on the Operating Point of PV Systems*

J. Nazdrowicz, M. Jankowski (Lodz Univ. of Techn., Poland)

**13:00 Lunch****14:00 Tourist Activities****19:00 Closing Ceremony**

<b>Time</b>	<b>Room C</b>
<b>09:30</b>	<b>Special Session 1 (Part 1): Offshore Wind Farms Energy &amp; Power Cables</b> Chairmen: Prof. Edward Gulski and Prof. George Anders  <i>CIGRE Study Committee B1 - Selected Topics of Power Cables Used in Offshore Wind Farms</i> A. Rakowska (Poznan Univ. of Techn., Poland)  <i>The Stage of Creating the Main Assumptions and Power Evacuation Concepts for Offshore Wind Farms</i> K. Glik, T. Orłowska (PGE Baltica, Warsaw, Poland)  <i>Quality Assurance of Wind Farm HVAC Long Length Cable Circuits</i> R. Jongen (onsite hv solutions ag, Switzerland)
<b>11:00</b>	<b>Coffee Break</b>
<b>11:30</b>	<b>Special Session 1 (Part 2): Offshore Wind Farms Energy &amp; Power Cables</b> Chairmen: Prof. Edward Gulski and Prof. George Anders  <i>Subsea Cable Designs for Offshore Wind Farms</i> Z. Telep (TELE-FONIKA Kable S.A., Poland)  <i>Offshore - Challenges in Designing, Taking into Account the Necessary Administrative Procedures for Onshore Power Cables for the Needs of Offshore Wind Farms</i> D. Oldziejewski, B. Giza (P&Q Sp. z o.o, Bialystok, Poland)  <i>Does It Make Sense to Invest in Recommended Certification of Offshore Wind Farms and What Is the Point?</i> G. Narwojsz (TÜV Rheinland Polska Sp. z o.o., Zabrze, Poland)
<b>13:00</b>	<b>Lunch</b>
<b>14:00</b>	<b>Special Session 1 (Part 3): Offshore Wind Farms Energy &amp; Power Cables</b> Chairmen: Prof. Edward Gulski and Prof. George Anders  <i>Production of Subsea Cables, Challenges and Special Requirements</i> L. Resner (TELE-FONIKA Kable S.A., Poland)  <i>Commissioning and Maintenance of Offshore Wind Farms Inter-array Cables</i> J. Parciak (onsite hv solutions Central Europe, Warsaw, Poland)  <i>Offshore Cables Failures and Repairs</i> P. Cherneski (N-Sea Group, Dordrecht, The Netherlands)

**15:30**   **Cofee Break**

**16:00**   **Special Session 1 (Part 4): Offshore Wind Farms Energy & Power Cables**

Chairmen: Prof. Edward Gulski and Prof. George Anders

*Offshore Wind Farms Innovative Laying of Power Cables*

W. Griffioen, V. Goncalves (Plumettaz, Switzerland)

*Accurate Calculation of Induced Voltages and Currents in Fibre Optic Units Integrated in Three-core Armoured Cables*

I. Chaleplidis, D. Chatzipetros, A. Chrysochos, K. Bitsi, C. Traianos (Hellenic Cables, Greece)

*Environmental Impact of Offshore Wind Farm Export Power Cables - Influence of the Magnetic Field*

M. Mróz (SPIE-ELBUD, Gdansk, Poland), G.J. Anders (Lodz Univ. of Techn., Poland)



# Kraków City Center Map



**Inst. of Computer Science**  
The Conference Site  
21 Kawiorzy Street



**Welcome Party**  
Cafe Oranzeria Restaurant  
Kossak Square 1



**Conference Banquet**  
Blessed Jacob hall  
Franciszkańska 4 Street



**Kraków Główny**  
Train Station



**City Center**  
Main Market Square

