

FINAL PROGRAMME

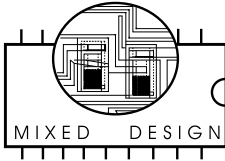
22nd International Conference



MIXDES 2015

**MIXED DESIGN OF INTEGRATED
CIRCUITS AND SYSTEMS**

**Toruń, Poland
25 - 27 June 2015**



22nd International Conference MIXED DESIGN OF INTEGRATED CIRCUITS AND SYSTEMS Toruń, Poland 25 - 27 June 2015

MIXDES 2015 Timetable

Day 1	Thursday, June 25 th , 2015			
	Room A	Room B	Room C	Room D
08:30	Conference Opening			
08:45	Plenary Session I			
09:50	Session 1 (Part 1)	Special Session III (Part 1)	Special Session I (Part 1)	Special Session II (Part 1)
11:10	Coffee Break			
11:30	Session 1 (Part 2)	Session 8	Special Session I (Part 2)	Special Session II (Part 2)
13:00	Lunch			
14:15	Introduction to Poster Session			
16:30	Coffee Break during Poster Session			
19:00	Welcome Party			

Day 2	Friday, June 26 th , 2015		
	Room A	Room B	Room C
08:15	Conference Opening		
08:20	Plenary Session I		
09:50	Session 1 (Part 3)	Session 3 (Part 1)	Special Session I (Part 3)
10:40	Coffee Break		
11:00	Session 1 (Part 4)	Session 3 (Part 2) & 7	Special Session I (Part 4)
13:00	Lunch		
14:00	Tourist Activities		

Day 3	Saturday, June 27 th , 2015		
	Room A	Room B	Room C
08:15	Plenary Session III		
09:15	Vendor Presentation		
09:50	Session 1 (Part 5)	Session 5	Special Session III (Part 2)
11:10	Coffee Break		
11:30	Session 1 (Part 6)	Session 2 (Part 1)	IEEE Meeting
13:00	Lunch		
14:00	Session 1 (Part 7) & 4	Session 6	Special Session III (Part 3)
15:40	Coffee Break		
16:00	Session 2 (Part 2)		
19:00	Closing Ceremony & Conference Banquet		

FROM THE ORGANISING COMMITTEE

Welcome to the MIXDES 2015 Conference.

The current edition of International Conference „Mixed Design of Integrated Circuits and Systems” is a 22nd in series of events held yearly since 1994 in the most renowned places in Poland. This year we meet together in Toruń – a medieval metropolis in the center of Poland especially known as a home town of Nicolaus Copernicus.

The MIXDES conference, one of the largest in the Central Europe in the field, is a forum for presenting the latest technical advancements and research in circuit design, modelling, simulation, testing and manufacturing in various areas, such as micro- and nanoelectronics, semiconductors, sensors, actuators, biomedical applications and power devices.

MIXDES 2015 offers a three-day technical program including keynote and plenary speeches, 122 oral and poster presentations reviewed and selected from all submissions from 21 countries. In addition to the regular programme, there will be seven invited papers:

- *Challenges in Design-oriented Modeling in Biology*
Prof. Christophe Lallement (University of Strasbourg, France)
- *Energy Efficiency Optimization for Digital Applications in 28nm UTBB FDSOI Technology*
Prof. Amara Amara (ISEP, France)
- *Formal Methods - Support or Scientific Decoration in Software Development?*
Prof. Tomasz Szmuc (AGH University of Science and Technology, Poland)
- *Prospect and Outlook of Electrostatic Discharge (ESD) Protection in Emerging Technologies*
Prof. Juin J. Liou (University of Central Florida, USA)
- *Silicon PhotoMultipliers: Introducing the Digital Age in Low Light Detection*
Prof. Massimo Caccia (Universita' dell'Insubria, Italy)
- *Single-Event Effects in Advanced CMOS Technologies - Analysis and Mitigation*
Dr. Marek Turowski (Robust Chip Inc., USA)
- *The Future is MEMS Design Considerations of Microelectromechanical Systems at Bosch*
Dr. Mike Schwarz (Robert Bosch GmbH, Germany)

The program of MIXDES 2015 includes also three special sessions:

- *Biomedical Measurement Technologies*
organised by Dr. Olaf Truszczyński, Prof. Marek Prost (Military Institute of Aviation Medicine, Poland) and Prof. Witold Pleskacz (Warsaw University of Technology, Poland)
- *Issues of Stereoscopic 3D Technologies and Image Acquisition in Current R&D*
organised by ROS3D Consortium
- *Open Source Compact/SPICE Modeling*
organised by Dr. Daniel Tomaszewski (Institute of Electron Technology, Poland) and Dr. Władysław Grabiński (GMC Suisse, Switzerland)

We would like to take this opportunity to thank many individuals, especially the reviewers, who have worked so hard to make this meeting happen.

We hope that you will enjoy your visit to Toruń and next year we will meet together in Łódź at MIXDES 2016.

Yours Sincerely,
MIXDES 2015 Organising Committee

ORGANIZED BY

Department of Microelectronics and Computer Science,
Lodz University of Technology, Poland
Institute of Microelectronics and Optoelectronics,
Warsaw University of Technology, Poland
ROS3D Consortium,
Institute of Science and Technology Stipendium, Poland
Military Institute of Aviation Medicine, Poland

IN COOPERATION WITH

Poland Section IEEE - ED & CAS Chapter
Section of Microelectronics and Section of Signals, Electronic Circuits and Systems
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

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Prof. M. Zubert	Lodz 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. Thermal Issues in Microelectronics**
Thermal and electro-thermal modelling, simulation methods and tools. Thermal mapping. Thermal protection circuits.
- 3. 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.
- 4. Microelectronics Technology and Packaging**
New microelectronic technologies. Packaging. Sensors and actuators.
- 5. Testing and Reliability**
Design for testability and manufacturability. Measurement instruments and techniques.
- 6. Power Electronics**
Design, manufacturing, and simulation of power semiconductor devices. Hybrid and monolithic Smart Power circuits. Power integration.
- 7. Signal Processing**
Digital and analog filters, telecommunication circuits. Neural networks. Artificial intelligence. Fuzzy logic. Low voltage and low power solutions.

8. Embedded Systems

Design, verification and applications.

9. Medical Applications

Medical and biotechnology applications. Thermography in medicine.

CONFERENCE CENTER

The conference will take place in:

Hotel Bulwar

ul. Bulwar Filadelfijski 18

87-100 Toruń

Tel. +48 56 62 39 400

Fax. +48 56 62 39 401

e-mail: recepca@hotelbulwar.pl

www: <http://www.hotelbulwar.pl/2/EN.html>

ACCOMMODATION

Hotel Bulwar is located in the Old Town of Toruń and has been nominated for World Luxury Hotel Award 2015. These former Prussian military barracks and the very first Naval Academy of Poland are now an extravagant hotel. It is situated on the picturesque embankment of the Vistula River, right in the heart of the City of Torun, amidst UNESCO listed medieval monuments. Combining history with modern design, simplicity with comfort, eco-friendly solutions with daily functionality, culinary creativity with locally-oriented products, this hotel will allow you to comfortably spend the time during the conference.

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 (welcome party and banquet not included). The standard registration fee is 380 € or 1530 Złoty. However, the sponsorship allowed organisers to cover part of the fee for IEEE members. For details, please consult the price policy on the Conference web site.

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.

MIXDES 2015

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

25 June (Thursday)	08:00 – 13:00 h, 14:00 – 18:00 h
26 June (Friday)	08:00 – 13:00 h
27 June (Saturday)	08:00 – 13:00 h, 14:00 – 17:00 h

GENERAL INFORMATION AND INQUIRIES

Dr. Mariusz Orlikowski

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e-mail: mixdes2015@dmcs.p.lodz.pl

tel.: +48 (0) 604397239

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

fax: +48 (0) 426360327

THE CITY OF TORUŃ

We would like to invite you to Toruń, one of the most beautiful cities of Poland. Picturesquely located on the both banks of the Vistula River, at a site of intersection of ancient trade routes, it has been propagating its traditional economy and openness to the world for nearly 800 years. It was established by the Teutonic Knights who left a token of remembrance which we can admire today as the castle ruins. Over the centuries the architecture of Toruń was constantly changing. The gothic buildings of Toruń's Old Town, which won the designation of World Heritage Site from UNESCO in 1997, present proof of Toruń's centuries-old economic, cultural and intellectual ties with the leading cities of Europe associated in the Hanseatic League.

These traditional ties have been propagated to this day by the contemporary residents of the city of Copernicus: Toruń is one of the most recognized academic centres. The Nicolaus Copernicus University, a successor of traditions of the Stefan Batory University of Vilnius, puts its primary focus on propagation and creative development of the fine arts, literature, history, and astronomy. The so-called Toruń school of preservation of cultural properties has been widely known throughout the world. Accomplishments of the Astronomical Research Centre of the University are highly regarded by scientists.

TOURIST ACTIVITIES

The guided tour around Toruń will start at 14:00 in front of the conference site. The guides in historical outfits will walk you through the most important historical monuments of the city:

- Medieval city fortifications from the 13th century
- Old town market with the Old Town Hall
- A 15th-century Gothic house (now a museum) where Copernicus was reputedly born
- The Cathedral of St. John the Evangelist and St. John the Baptist
- Ruins of 13th-century Teutonic Knights' castle

During the walk - a visit to the Museum of Gingerbread and baking of your own cake.



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 many places such as banks, hotels, car-rental offices, restaurants, and large shops. Approximate currency exchange rate: 1 € = 4.1 zloty, 1 \$ = 3.7 zloty (for the up-to-date information refer to <http://www.nbp.pl>).

Credit cards:

Visa, American Express, 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 zloty (zł, PLN) and grosz (gr), 1 zł = 100 gr. The Polish zloty is a fully convertible currency internally in Poland.

TRANSPORT

The airport nearest Toruń is Bydgoszcz I.J. Paderewski Airport located in Bydgoszcz, about 50km from Toruń. There are also good road or railway connections to Gdańsk Lech Walesa airport and Warsaw Chopin airport.

Toruń can be reached by train or road. There are several direct busses from Warsaw and Gdańsk to Toruń:

Line	PKS Pock	PKS Bydgoszcz	PKS "Polonus"	PKS Pock	PKS Bydgoszcz	Arriva	PKS Kalisz	Arriva
Runs	daily	daily	daily	daily	daily	daily	daily	daily
Warszawa Zachodnia	07:45	09:50	10:45	12:45	14:30			
Gdańsk Airport						12:35		
Gdańsk Bus Station							15:45	17:15
Toruń Bus Station	12:10	13:49	15:00	17:10	18:29	15:45	18:15	19:45

We recommend to reserve the ticket for the bus at www.e-podroznik.pl.

There are also train connections from Warszawa Centralna Station to Toruń Główny, as shown below:

Train type direction	TLK Bydgoszcz	TLK Bydgoszcz	TLK Bydgoszcz	TLK Gdynia	TLK Bydgoszcz	TLK Bydgoszcz	TLK Bydgoszcz
Runs	daily	Mo-Fri	Mo-Fri	Mo-Fri	Mo-Fri	Mo-Fri	daily
Warszawa Centralna	07:00	09:05	10:54	13:59	14:50	16:51	18:59
Toruń Główny	09:49	11:57	14:01	16:48	17:57	19:37	21:43

Due to the requests, several train connections from Gdańsk to Toruń are shown below:

Train type direction	TLK Katowice	TLK Lublin	TLK Kraków	TLK Katowice	IC Wrocław	TLK Warsaw	TLK Poznań	regional
Runs	daily	daily	daily	daily	daily	daily	daily	daily
Gdańsk Główny	7:53	9:10	10:41	13:31	17:01		19:08	
Bydgoszcz Główna	9:37	10:59	12:34	15:22	18:41		20:50	
Bydgoszcz Główna	9:55	11:14	13:05	15:39	→	18:57	→	20:54
Toruń Główny	10:45	12:01	13:39	16:32		19:49		21:47

Please check your connections at <http://rozklad.pkp.pl/bin/query.exe/en> before coming to Toruń.

To travel Toruń you can use the city public transport. You can also use single fare ticket, if your journey can be done by one tram or bus. Time-limited tickets are also available – these are valid for the limited period of time, you can change bus or tram unlimited number of times.

Validity period	Price of ticket	
	Standard lines	Night lines
Single fare	2.80 PLN	5.60 PLN
8 trips	20,10 PLN	-

The main conference building (HOTEL Bulwar) is about 2 km on foot from the Toruń Główny train station. One can take the bus number 11 (direction KONIUCHY), 12 (dir. POLANA), 13 (dir. DWORZEC WSCHODNI), 14 (dir. CENTRALNY CMENTARZ), 22 (dir. NA SKARPIE), 27 (dir. BARBARKA) or 36 (dir. PLAC SKALSKIEGO), and leave it at PLAC RAPACKIEGO stop (2nd stop). TAXI from the station are also available.

PROGRAMME OF THE CONFERENCE

The programme of the MIXDES 2015 Conference will include oral presentations of contributed and invited papers, special sessions and poster session.

Except for the plenary and poster 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.

Poster presentations:

The authors presenting their papers at the poster sessions will have at their disposal an A0 panel with all the accessories necessary to attach your poster. On the third conference day after lunch, an introduction to poster session is planned, in which the authors are asked to present their work very shortly in front of the audience: 2-3 slides, within 1-2 minutes. The questions and discussions will be continued at the poster panels.

Lunches:

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

MIXDES 2015

Welcome Party and Conference Banquet:

The Welcome Party will be organised on Thursday (the first conference day) at 19:00. The Conference Banquet and the Awards Ceremony will take place on Saturday at 19:00.

The Welcome Party and the Conference Banquet are not included in the student registration fee.

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.

STEREOSCOPIC 3D TECHNOLOGIES R&D

3D movie experience is exciting and enjoyable for everyone. We would like to invite you to participate in a study on perception of 3D film image. The test will be performed on CinemaVision movie diagnostics tool, which is a part of the CinemaVisionSystem consisting of software and devices for registration and postproduction of 3D movies. The aim of the test is to analyze the image in terms of attractiveness for a viewer and quality of stereoscopic depth. The survey will take approximately 5 minutes and does not require any prior preparation.

CAR RENTAL

The Eco Rental offers 10% discount for MIXDES 2015 participants for car rental providing "MIXDES" keyword using on-line reservation (www.ecorental.pl) or via phone call (+48 225713540). If you are coming to Warsaw by airplane, the Eco Rental is available at the airport.



Time	Room A
08:30	Conference Opening Chairmen: Prof. A. Napieralski and Prof. W. Kuźmicz
08:45	Plenary Session I Chairman: Prof. A. Napieralski <i>Prospect and Outlook of Electrostatic Discharge (ESD) Protection in Emerging Technologies</i> J.J. Liou (Univ. Central Florida, USA) <i>Challenges in Design-oriented Modeling in Biology</i> C. Lallement, M. Madec (Univ. Strasbourg, France)
09:50	Session 1 (Part 1): Design of Integrated Circuits and Microsystems Chairman: Dr. J.-M. Sallese <i>A 130 nm Wideband Fully Differential Linear Low Noise Amplifier</i> A. Zokaei, A. Amirabadi (Islamic Azad Univ., Iran), M. Ghasemzadeh (Urmia Univ., Iran) <i>A 6-Bit 800MS/s Flash ADC in 0.35μm CMOS</i> M. Ghasemzadeh (Urmia Univ., Iran), A. Soltani (Urmia Graduate Institute, Iran), A. Akbari, K. Hadidi (Urmia Univ., Iran) <i>A 96 dB SNDR Current-Mode Continuous-Time $\Delta\Sigma$ Modulator for Electrochemical Sensor Arrays</i> A. Laifi, M.A. Al Abaji, R. Thewes (Tech. Univ. Berlin, Germany) <i>A Deep-Submicron CMOS Flow for General-Purpose Timing-Detection Insertion</i> A. Dixius, D. Walter, S. Höppner, H. Eisenreich, R. Schüffny (Tech. Univ. Dresden, Germany)
11:10	Coffee Break
11:30	Session 1 (Part 2): Design of Integrated Circuits and Microsystems Chairman: Prof. A. Pfitzner <i>A High Spatial Resolution 64-Channel In-Vivo Neural Recording System</i> M. Masoumi, G. Bertotti, S. Keil, R. Thewes (Tech. Univ. Berlin, Germany) <i>A Highly Linear CMOS Buffer Based on Third Harmonic Cancellation</i> M. Mousazadeh, K. Hadidi, A. Khoei, M. Ghasemzadeh (Urmia Univ., Iran)

A Hybrid Voltage Reference

M. Hofer, C. Boehm, R. Kolm, A. Missoni (Infineon Technologies Austria, Austria)

Custom Method for Automation of Microbolometer Design and Simulation

M. Melnyk, A. Kernytsky, M. Lobur (Lviv Polytechnic National Univ., Ukraine),
M. Szermer, P. Zając, C. Maj, W. Zabierowski (Lodz Univ. of Techn., Poland)

13:00 Lunch

14:15 Introduction to Poster Session

Chairman: Prof. W. Kuźmicz

A Comparison of Methods for Time-to-digital Conversion Based on Independent Coding Lines and Multi-edge Coding

D. Sondej, R. Szplet (Military Univ. of Techn., Poland)

A New Ultra High Speed 7-2 Compressor with a New Structure

M. Ghasemzadeh, A. Akbari (Urmia Univ., Iran), A. Soltani (Urmia Graduate Institute, Iran), K. Hadidi (Urmia Univ., Iran)

A Study on Microbolometer Electro-thermal Circuit Modelling

J. Nazdrowicz, M. Szermer, C. Maj, W. Zabierowski, A. Napieralski (Lodz Univ. of Techn., Poland)

An Advanced Software Model for Optimization of Self-Organizing Neural Networks Oriented on Implementation in Hardware

M. Kolasa, R. Długosz (UTP Univ. of Science and Techn., Poland)

Analog Sorting Circuit for the Application in Self-Organizing Neural Networks Based on Neural Gas Learning Algorithm

T. Talaśka, R. Długosz (UTP Univ. of Science and Techn., Poland)

Choosing the Optimal HDL Model of Thermometer-to-Binary Encoder

Z. Jaworski (Warsaw Univ. of Techn., Poland)

Design for the Testability of the Multichannel Neural Recording and Stimulating Integrated Circuit

P. Kmon, P. Otfinowski, P. Gryboś, R. Szczygieł, M. Żołądź, A. Lisicka (AGH Univ. of Science and Techn., Poland)

Fast and Accurate Fractional Frequency Synthesizer in 0.18 μ m Technology

M. Ghasemzadeh (Urmia Univ., Iran), A. Soltani (Urmia Graduate Inst., Iran),
A. Akbari, K. Hadidi (Urmia Univ., Iran)

IF Polyphase Filter Design and Calibration with Back-gate Biasing in 28 nm FD-SOI Technology

M. Derlecki, T. Borejko, W. Pleskacz (Warsaw Univ. of Techn., Poland)

Investigation of Parallel Hybrid CMOS Envelope Amplifier Designed on AMS 0.35 μm Process

T. Brusev, I. Uzunov, G. Kunov, E. Gadjeva (Tech. Univ. Sofia, Bulgaria)

Low Chip Area, Low Power Dissipation, Programmable, Current Mode, 10-bits, SAR ADC Implemented in the CMOS 130nm Technology

R. Długosz (UTP Univ. of Science and Techn., Poland), G. Fischer (IHP Microelectronics, Germany)

Low Voltage LNA Implementations in 28 nm FD-SOI Technology for GNSS Applications

A. Halauko, T. Borejko, W. Pleskacz (Warsaw Univ. of Techn., Poland)

Optimization of Capacitive Divider for 8-bit DAC Realized in 65 nm CMOS Process

Z. Jaworski (Warsaw Univ. of Techn., Poland)

Analysis of a Noise Cancelling LNA Using a Si₂ OpenAccess Based Tool - CADIT

J. Alarcão, L. Oliveira, J. Oliveira, R. Santos-Tavares (Univ. Nova de Lisboa, Portugal)

Generalized SPICE Model of Photovoltaic Modules

E. Gadjeva, M. Hristov (Tech. Univ. Sofia, Bulgaria)

Method for 315/433 MHz Remote Keyless Entry Sensitivity and Range Statistical Analysis for Automotive Applications

M. Frankiewicz, M. Jabłeka, K. Boroń, P. Urban, J. Guździk, A. Ryszko (Delphi, Poland), G. Jiang (Delphi, USA)

Probabilistic Reasoning in Practical System Analysis

Ł. Wojdowski (Lodz Univ. of Techn., Poland)

Hybrid LBDD PWM Modulator for Digital Class-BD Audio Amplifier Based on STM32F407VGT6 Microcontroller and Analog DLL

J. Jasielski (Higher Vocational School in Tarnow, Poland), W. Machowski (AGH Univ. of Science and Techn., Poland), S. Kuta, W. Kołodziejski (Higher Vocational School in Tarnow, Poland)

Voltage Regulators for the Laptop's Power Supply Station with Photovoltaic Modules

P. Górecki (Gdynia Maritime Univ., Poland)

FPGA Implementation of 3-D Separable Gauss Filter Using Pipeline Rotation Structures

K. Wawryn, P. Poczekajło, R. Wirski (Koszalin Univ. of Techn., Poland)

Fractional Fourier Transform and Its Application to Engine Knock Detection

J. Fiołka (Silesian Univ. of Techn., Poland)

Control and Monitoring System Prototype for Pulse Plasma Sintering Process

R. Kotas, P. Marciniak, B. Sakowicz, D. Makowski, M. Czarnecki (Lodz Univ. of Techn., Poland), J. Wachowicz, R. Zieliński, T. Truszkowski, M. Rosiński, A. Michalski, R. Sobiecki (Warsaw Univ. of Techn., Poland), G. Skrabalak (Inst. of Advanced Manufacturing Techn., Poland), R. Talar (Poznan Univ. of Techn., Poland), A. Napieralski (Lodz Univ. of Techn., Poland)

Logic Controller Design System Supporting UML Activity Diagrams

M. Grobelny, I. Grobelna (Univ. Zielona Góra, Poland)

The Monitoring Network for Novel Building Envelopes

D. Obrębski, M. Zbieć (Institute of Electron Techn., Poland)

16:30 Coffee Break during Poster Session

19:00 Welcome Party

Time**Room B****09:50 Special Session III (Part 1): Open Source Compact/SPICE Modeling**

Chairman: Prof. M. Brinson

Challenges for Analog Circuits in sub-100 nm CMOS Nodes

B. Landgraf (Infineon Technologies, Austria)

Integration of SBML Models for the Description of Biological System in a Lab-On-Chip

A. Rezgui, M. Madec, C. Lallement, J. Haiech (Strasbourg Univ., France)

Verilog-A Compact Space-dependent Model for Biology

E. Rosati, M. Madec, J.-B. Kammerer, A. Rezgui, C. Lallement, J. Haiech (Univ. Strasbourg, France)

The Future is MEMS Design Considerations of Microelectromechanical Systems at Bosch

M. Schwarz, J. Franz, M. Reimann (Robert Bosch GmbH, Germany)

FOSS EKV 2.6 Parameter Extractor

W. Grabiński (GMC Research, Switzerland), D. Tomaszewski (Institute of Electron Techn., Poland), F. Jazaeri, A. Mangla, J.-M. Sallese, M.-A. Chalkiadaki, A. Bazigos (EPFL, Switzerland), M. Bucher (Tech. Univ. Crete, Greece)

11:10 Coffee Break**11:30 Session 8: Embedded Systems**

Chairman: Prof. Z. Ciota

A Relational Database Environment for Numerical Simulation Backend Storage

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

An Efficient Post-Processing Method for Pipelined Pseudo-Random Number Generator in SoC-FPGA

P. Dąbal, R. Pelka (Military Univ. of Techn., Poland)

Custom Design of Galvanometric Motor for Large Mirror

D. Kacperski, M. Włodarczyk, K. Grabowski (Lodz Univ. of Techn., Poland)

Mirror Galvanometer-Based Laser Projector

Ł. Dykcik, D. Kacperski, P. Sękański (Lodz Univ. of Techn., Poland)

13:00 Lunch**19:00 Welcome Party**

09:50 **Special Session I (Part 1): Biomedical Measurement Technologies**

Chairman: Dr. O. Truszczyński

A CMOS System-on-Chip for Physiological Parameters Acquisition, Processing and Monitoring

K. Siwiec, K. Marcinek, T. Borejko (Warsaw Univ. of Techn., Poland), A. Jarosz (Institute of Electron Techn., Poland), J. Kopański (Warsaw Univ. of Techn., Poland), E. Kurjata-Pfitzner (Institute of Electron Techn., Poland), P. Narczyk, M. Plasota, A. Wielgus, W. Pleskacz (Warsaw Univ. of Techn., Poland)

The BioSip System - Hardware Solutions

A. Michnik, Z. Szczurek, B. Szuster, B. Kubik, P. Kowalski (Inst. of Medical Techn. and Equipment, Poland)

Inertial Sensor Location Analysis in Automatic Balance Assessment

P. Badura, E. Piętka (Silesian Univ. of Techn., Poland)

11:10 **Coffee Break**

11:30 **Special Session I (Part 2): Biomedical Measurement Technologies**

Chairman: Prof. W. Pleskacz

First Approach for Design of an Autonomous Measurement System to Aid Determination of the Psychological Profile of Soldiers

K. Różanowski (Military Inst. of Aviation Medicine, Poland), T. Sondej (Military Univ. of Techn., Poland), J. Lewandowski (Military Inst. of Aviation Medicine, Poland)

Organization of Fast Biomedical Data Transmission in a Low-power, High-reliability Wireless Personal Area Network (WPAN) Dedicated to Data Acquisition from BIOSIP Modules

B. Kubik, Z. Szczurek, P. Kowalski, A. Michnik, B. Szuster (Inst. of Medical Techn. and Equipment, Poland)

Artificial Neural Networks in Accelerometer-based Human Activity Recognition

P. Lubina, M. Rudzki (Silesian Univ. of Techn., Poland)

NIR Finger Vascular System Imaging in Angiology Applications

M. Waluś, K. Bernacki (Silesian Univ. of Techn., Poland), M. Nycz (Medical Univ. of Silesia, Poland), J. Konopacki (Silesian Univ. of Techn., Poland)

13:00 **Lunch**

19:00 **Welcome Party**

14:00 **Special Session II (Workshop): Issues of Stereoscopic 3D Technologies and Image Acquisition in Current R&D**

19:00 **Welcome Party**

Time	Room D
09:50	Special Session II (Part 1): Issues of Stereoscopic 3D Technologies and Image Acquisition in Current R&D Chairman: Dr. D. Makowski <i>Methods of 3D Images Quality Assesment</i> B. Sakowicz, M. Kamiński, R. Ritter, R. Kotas, P. Marciniak, mP. Sękalski, A. Napieralski (Lodz Univ. of Techn., Poland) <i>Stereoscopic Image Perception Quality Factors</i> K. Fornalczyk, P. Napieralski, D. Szajerman, A. Wojciechowski (Lodz Univ. of Techn., Poland), P. Sztoch (FINN, Poland), J. Wawrzyniak (Inst. of Science and Techn. Stipendium, Poland) <i>Towards Automatic Calibration of Stereoscopic Video Systems</i> P. Perek, D. Makowski, A. Mielczarek, A. Napieralski (Lodz Univ. of Techn., Poland), P. Sztoch (FINN, Poland) <i>Calibration of Stereoscopic Camera Rigs Using Dedicated Real-Time SDI Video Processor</i> A. Mielczarek, P. Perek, D. Makowski, A. Napieralski (Lodz Univ. of Techn., Poland), P. Sztoch (FINN, Poland)
11:10	Coffee Break
11:30	Special Session II (Part 2): Issues of Stereoscopic 3D Technologies and Image Acquisition in Current R&D Chairman: Mr. J. Wawrzyniak <i>Application of PCI Express Interface in High-Performance Video Systems</i> D. Makowski (Lodz Univ. of Techn., Poland) <i>Remote Control of 3D Camera Rig with Embedded System</i> P. Plewiński, D. Makowski, A. Mielczarek, A. Napieralski (Lodz Univ. of Techn., Poland), P. Sztoch (FINN, Poland) <i>Mobile Application for Remote Control of Stereoscopic Images Acquisition System</i> M. Włodarczyk, M. Borzęcki, T. Płuciennik, A. Skwarna, M. Świecznik, J. Sierocińska, B. Józwiak (Open-RnD, Poland) <i>A Simple Multithreaded C++ Framework for High-Performance Data Acquisition Systems</i> R. Inglés, P. Perek, M. Orlikowski, A. Napieralski (Lodz Univ. of Techn., Poland)
13:00	Lunch
19:00	Welcome Party

08:15 Plenary Session II

Chairman: Prof. G. De Mey

Silicon PhotoMultipliers: Introducing the Digital Age in Low Light Detection
M. Caccia (Univ. dell'Insubria, Italy)

Energy Efficiency Optimization for Digital Applications in 28nm UTBB FDSOI Technology

A. Amara, N. Gupta, K.A. Shaik, C. Anghel, K. Itoh (ISEP, France)

09:20 Session 1 (Part 3): Design of Integrated Circuits and Microsystems

Chairman: Prof. A. Rybarczyk

An Aging-Aware Transistor Sizing Tool Regarding BTI and HCD Degradation Modes

N. Hellwege, N. Heidmann, M. Erstling, D. Peters-Drolshagen, S. Paul (Univ. Bremen, Germany)

An Ultra High Speed Booth Encoder Structure for Fast Arithmetic Operations
M. Ghasemzadeh, A. Akbari, K. Hadidi (Urmia Univ., Iran)

Analysis and Implementation of on the Fly Stopping Criteria for Layered QC LDPC Decoders

A. Hera, O. Boncalo, C.-E. Gavrilu, A. Amaricai (Univ. Politehnica Timisoara, Romania), V. Savin (CEA-LETI, France), D. Declercq, F. Ghaffari (ETIS-ENSEA, France)

Charge Sensitive Amplifier for Nanoseconds Pulse Processing Time in CMOS 40 nm Technology

R. Kłeczek, P. Gryboś, R. Szczygieł (AGH Univ. of Science and Techn., Poland)

10:40 Coffee Break

11:00 Session 1 (Part 4): Design of Integrated Circuits and Microsystems

Chairman: Dr. M. Turowski

Design of Building Blocks of an X-band Silicon Integrated Transceiver for FMCW Radar

R. Piesiewicz (SIRC, Poland)

Development of Radiation-hard Bandgap Reference and Temperature Sensor in CMOS 130 nm Technology

M. Kuczynska, S. Gozdur, S. Bugiel, M. Firlej, T. Fiutowski, M. Idzik (AGH Univ. of Science and Techn., Poland), S. Michelis (CERN, Switzerland), J. Moron, D. Przyborowski, K. Swientek (AGH Univ. of Science and Techn., Poland)

Development of Low-power High Speed (~10Gb/s) Drivers in CMOS 130 nm Technology

M. Kuczynska, S. Bugiel, M. Firlej, T. Fiutowski, M. Idzik, J. Moron, K. Swientek (AGH Univ. of Science and Techn., Poland)

Reversible Circuit Synthesis with Particle Swarm Optimization Using Crossover Operator

K. Podlaski (Univ. Lodz, Poland)

13:00 Lunch

14:00 Tourist Activities

09:20 Session 3 (Part 1): Analysis and Modelling of ICs and Microsystems

Chairman: Prof. G. De Mey

A Comparison of the Volterra Series-based Nonlinear S-parameters and X-parameters

C. Widemann, H. Weber, S. Schatz, W. Mathis (Leibniz Univ. Hannover, Germany)

Compact DC Model of a JVeSFET Transistor with Reduced Number of Empirical Parameters

M. Staniewski, A. Pfitzner (Warsaw Univ. of Techn., Poland)

Modeling Parasitic Vertical PNP in HVCMOS

C. Stefanucci, P. Buccella, M. Kayal, J.-M. Sallese (EPFL, Switzerland)

Noise Optimization of the Time and Energy Measuring ASIC for Silicon Tracking System

K. Kasiński, R. Kłeczek, R. Szczygieł, P. Otfinowski, P. Gryboś (AGH Univ. of Science and Techn., Poland)

10:40 Coffee Break

11:00 Session 3 (Part 2) & 7: Analysis and Modelling of ICs and Microsystems & Signal Processing

Chairman: Prof. P. Gryboś

Power Analysis for Two-Stage High Resolution Pipeline SAR ADC

K. Chen, Q.-T. Duong, A. Alvandpour (Linköping Univ., Sweden)

Spice Simulation of Passive Protection in Smart Power ICs

P. Buccella, C. Stefanucci, J.-M. Sallese, M. Kayal (EPFL, Switzerland)

Strange History of an Operator \circ

A. Borys (Gdynia Maritime Univ., Poland)

Asphalt Surfaced Pavement Cracks Detection Based on Histograms of Oriented Gradients

R. Kapela, P. Śniatała, A. Turkot, A. Rybarczyk, A. Pożarycki (Poznan Univ. of Techn., Poland), A. Błoch (Atrem S.A., Poland), P. Rydzewski, M. Wyczałek (Poznan Univ. of Techn., Poland)

Differential-pair-based Current-mode Analog Signal Processing

R. Wojtyna (Univ. of Techn. & Life Sciences, Poland)

13:30 Lunch

14:30 Tourist Activities

Time	Room C
09:20	Special Session I (Part 3): Biomedical Measurement Technologies Chairman: Prof. A. Tarnowski <i>Implementation of an Algorithm for Heart Rate Measurement in a Specialized Multi-core Processor</i> T. Sondej, D. Tomaszewski (Military Univ. of Techn., Poland), K. Rózanowski (Military Inst. of Aviation Medicine, Poland) <i>Automatic Cysts Detection in Optical Coherence Tomography Images</i> W. Więclawek (Silesian Univ. of Techn., Poland) <i>Telemonitoring of Pregnant Women at Home - Biosignals Acquisition and Measurement</i> A. Pawlak (Silesian Univ. of Techn., Poland), K. Horoba, J. Jezewski, J. Wrobel, A. Matonia (Inst. of Medical Techn. and Equipment, Poland) <i>Feature Vectors of the Cruciate Ligaments of the Knee Joint</i> P. Zarychta (Silesian Univ. of Techn., Poland)
10:40	Coffee Break
11:00	Special Session I (Part 4): Biomedical Measurement Technologies Chairman: Prof. J. Achimowicz <i>Multimodal Biometric Database DMCSv1 of 3D Face and Hand Scans</i> W. Sankowski, P.S. Nowak, P. Krotewicz (Lodz Univ. of Techn., Poland) <i>Computer Aided Diagnosis Workstation for Brain Tumor Assessment</i> J. Kawa, M. Rudzki, E. Piętka, P. Szwarc (Silesian Univ. of Techn., Poland) <i>Software Tool for the Analysis of Components Characteristic for ECG Signal</i> M. Bernat, Z. Piotrowski (Military Univ. of Techn., Poland) <i>Possibilities and Limitations of Automated Psychological Profiling</i> A. Tarnowski, K. Lapkiewicz (Military Inst. of Aviation Medicine, Poland) <i>Wireless Medical Systems for Recording Biomedical Parameters Developed at ITAM in Light of Global Achievements in the Field and Anticipated Development Trends</i> B. Szuster, Z. Szczurek, B. Kubik, P. Kowalski, A. Michnik (Inst. of Medical Techn. and Equipment, Poland)
13:30	Lunch
14:30	Tourist Activities

Time

Room A

08:15 Plenary Session III

Chairman: Prof. W. Kuźmicz

Formal Methods - Support or Scientific Decoration in Software Development
T. Szmuc, M. Szpyrka (AGH Univ. of Science and Techn., Poland)

Single-Event Effects in Advanced CMOS Technologies - Analysis and Mitigation
M. Turowski (Robust Chip Inc., USA)

09:15 Vendor Presentation

Chairman: Prof. W. Kuźmicz

The Concept of Virtual Instrumentation as Solution for Challenges in Modern Electronics Research Laboratory
M. Antoniuk (National Instruments, Poland)

09:50 Session 1 (Part 5): Design of Integrated Circuits and Microsystems

Chairman: Prof. A. Pfitzner

Design of the Ultra Low Power, Low Area Occupied Amplifier for Recording Biomedical Signals in the Single Hz Bandwidth
P. Kmon, P. Gryboś (AGH Univ. of Science and Techn., Poland)

Leakage Current Compensation for a 450 nW, High-Temperature, Bandgap Temperature Sensor
J. Nilsson, J. Borg, J. Johansson (Luleå Univ. of Techn., Sweden)

Readout Interface for Capacitive MEMS Microphone in CMOS Technology
D. Arbet, G. Nagy, M. Kováč, V. Stopjaková, L. Nagy (Slovak Univ. of Techn., Slovakia)

Reversible Logic Synthesis of Boolean Functions Using Functional Decomposition
M. Rawski, P. Szołkowski (Warsaw Univ. of Techn., Poland)

11:10 Coffee Break

11:30 Session 1 (Part 6): Design of Integrated Circuits and Microsystems

Chairman: Dr. M. Turowski

Mixed Signal ASIC Controller for Satellite Medium Power DC/DC Converters
K. Skup, P. Orleański, W. Nowosielski (Space Research Center, Polish Academy of Sciences, Poland), M. Jankowski, G. Jabłoński, Ł. Starzak, M. Szermer, A. Napieralski (Lodz Univ. of Techn., Poland), R. Darakchiev, M. Mroczkowski (Astri Polska, Poland)

Robust and Efficient Design Plan for Integrated Differential Negative-Gm LC VCOs
B. Raab, M. Kaufmann, A. Rauchenecker, T. Ostermann (Univ. Linz, Austria)

The Complete Readout System for THz Spectroscopy
C. Kołaciński, D. Obrębski, M. Zbieć (Institute of Electron Techn., Poland),
P. Zagrajek (Military Univ. of Techn., Poland)

The Modular FPGA-Based Hardware Platform for Emulation
Ł. Matoga, A. Koczor, M. Gołek, P. Ządek, P. Penkala (Evatronix, Poland)

13:00 Lunch**14:00 Session 1 (Part 7) & 4: Design of Integrated Circuits and Microsystems & Microelectronics Technology and Packaging**

Chairman: Dr. M. Turowski

Test System of the Time-over-Threshold Based Chip Optimized for Linear Transfer Characteristics and Low Power for Particle Tracking Applications
K. Kasiński, R. Kłeczek (AGH Univ. of Science and Techn., Poland)

Wideband CMOS RF Front-End Receiver with Integrated Filtering
F. Araújo, M. Fernandes, J. Pinto, L. Oliveira, J. Oliveira (Univ. Nova de Lisboa, Portugal)

Silicon-on-Insulator Technology for Bioluminescence Imaging and Application to a Switching Photodetector
D. Sallin (EPFL, Switzerland), N. Abdo (ISAE-SUPAERO, France), A. Koukab (EPFL, Switzerland), M. Estribeau, P. Magnan (ISAE-SUPAERO, France), M. Kayal (EPFL, Switzerland)

Use of Electric Energy Stored in a Textile-based PEDOT:PSS Capacitor
S. Odhiambo (Gent Univ., Belgium), P. Fiszer (Lodz Univ. of Techn., Poland),
C. Hertleer, L. Van Langenhove, G. De Mey (Gent Univ., Belgium),
A. Napieralski (Lodz Univ. of Techn., Poland)

15:40 Coffee Break**19:00 Closing Ceremony & Conference Banquet**

09:50 **Session 5: Testing and Reliability**

Chairman: Prof. A. Rybarczyk

Analog Testing Stimulus Optimization for Generating by Means of Sigma-Delta Modulation

T. Golonek (Silesian Univ. of Techn., Poland)

Design and Measurement Methodology for a Sub-picoampere Current Digitiser

E. Voulgari (EPFL and CERN, Switzerland), M. Noy, F. Anghinolfi (CERN, Switzerland), F. Krummenacher, M. Kayal (EPFL, Switzerland)

Methodology of Automation Process of Wafer Tests

P. Maj, A. Krzyżanowska, P. Gryboś, R. Szczygieł, A. Kozioł (AGH Univ. of Science and Techn., Poland)

11:10 **Coffee Break**

11:30 **Session 2 (Part 1): Thermal Issues in Microelectronics**

Chairman: Prof. G. De Mey

Estimation of Heat Transfer Coefficient Temperature Dependence from Cooling Curve Measurements

A. Czerwoniec, T. Torzewicz, A. Samson, M. Janicki (Lodz Univ. of Techn., Poland)

Modelling Power LEDs with Thermal Phenomena Taken into Account

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

Stability Criteria of the Thermal Characterization of Discrete Components

G. Simon (Budapest Tech. Univ., Hungary), G. Farkas (Mentor Graphics, Hungary)

Static and Dynamic Losses vs. Temperature in Different CMOS Technologies

P. Kocanda, A. Kos (AGH Univ. of Science and Techn., Poland)

14:00 Session 6: Power Electronics

Chairman: Prof. J. Zarębski

A Simple Class-D Audio Power Amplifier Using a Passive CT $\Sigma\Delta$ Modulator for Medium Quality Sound Systems

J.L.A. de Melo, P.V. Leitão, J. Goes, N. Paulino (Univ. Nova de Lisboa, Portugal)

An Improved Junction Termination Design Using Deep Trenches for Superjunction Power Devices

S. Noblecourt, F. Morancho, K. Isoird, P. Austin (LAAS-CNRS and Univ. Toulouse, France), J. Tasselli (LAAS-CNRS, France)

Capacity Degradation of Lead-acid Batteries Under Variable-depth Cycling Operation in Photovoltaic System

W. Marańda (Lodz Univ. of Techn., Poland)

Performance Analysis of a PMSM Drive with Torque and Speed Control

T. Rudnicki, R. Czerwiński, D. Polok, A. Sikora (Silesian Univ. of Techn., Poland)

Simulation and Characterization of Ion Irradiated 4H-SiC JBS Diode

R. Sharma, P. Hazdra, S. Popelka (Czech Techn. Univ. Prague, Czech Republic)

15:40 Coffee Break**16:00 Session 2 (Part 2): Thermal Issues in Microelectronics**

Chairman: Prof. G. De Mey

Application of the Electrothermal Average Inductor Model for Analyses of Boost Converters

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

Investigation of Localized Thermal Vias for Temperature Reduction in 3D Multicore Processors

P. Zajęc, M. Galicia, C. Maj, A. Napieralski (Lodz Univ. of Techn., Poland)

Numerical Solution of 1-D DPL Heat Transfer Equation

T. Raszkowski, M. Zubert, M. Janicki, A. Napieralski (Lodz Univ. of Techn., Poland)

19:00 Closing Ceremony & Conference Banquet

Time

Room C

09:50 **Special Session III (Part 2): Open Source Compact/SPICE Modeling**

Chairman: Dr. W. Grabiński

On the Modelisation of the Main Characteristics of SOI Hall Cells by Three-dimensional Physical Simulations

M.-A. Paun (Univ. Cambridge, UK)

Qucs-based Development of an Energy Harvester Compact Model

D. Tomaszewski, K. Domański, P. Prokaryn (Institute of Electron Techn., Poland)

Qucs Equation-Defined and Verilog-A RF Device Models for Harmonic Balance Circuit Simulation

M. Brinson (London Metropolitan Univ., UK), V. Kuznetsov (Bauman Moscow Tech. Univ., Russia)

Lung/Airway Dynamic Model Using ABM Elements and PSPICE

F. Masana (Barcelona Semiconductors, Spain)

11:10 **Coffee Break**

11:30 **IEEE Meeting**

13:00 **Lunch**

14:00 **Special Session III (Part 3): Open Source Compact/SPICE Modeling**

Chairman: Dr. D. Tomaszewski

Wavelet-Based Calculation of the Transmission Coefficient for Tunneling Events in Tunnel-FETs

A. Farokhnejad (Tech. Hochschule Mittelhessen, Germany), M. Gräf (Tech. Hochschule Mittelhessen, Germany and Univ. Rovira i Virgili, Spain), A. Klös (Tech. Hochschule Mittelhessen, Germany)

Channel Charge Model of a Dual-Gate Junctionless Transistor

D. Kasprowicz (Warsaw Univ. of Techn., Poland)

Simple Methods of Threshold Voltage Parameter Extraction for MOSFET Models

D. Tomaszewski, J. Malesińska, G. Głuszko (Institute of Electron Techn., Poland)

15:40 **Coffee Break**

19:00 **Closing Ceremony & Conference Banquet**

Toruń City Map



Conference Site
Hotel Bulwar
Bulwar Filadelfijski 18



Train Station
Toruń Główny
(Main Station)



Train Station
Toruń Miasto



Bus Station

