

**14-th NATIONAL CONFERENCE
WITH INTERNATIONAL PARTICIPATION**

ELECTRONICA 2023



PRELIMINARY PROGRAMME

**1 – 3 June 2023
Sofia**

**National Science and Technical Centre
108 Rakovski Str.
&
Virtual room**

14th NATIONAL CONFERENCE WITH INTERNATIONAL PARTICIPATION “ELECTRONICA 2023”

Organized by:

The Union of Electronics, Electrical Engineering and Telecommunications (CEEC),

Technical University of Sofia (TU-Sofia),

IEEE Bulgarian Section,

and Faculty of Electronic Engineering and Technologies (FEET)

“ELECTRONICA 2023” is technically co-sponsored by

IEEE (*Conference record # 58875*)

and is part of the "Science Days of TU-Sofia" forum



In cooperation with:

Federation of the Scientific and Technical Unions in Bulgaria (FNTS),

Bulgarian Academy of Sciences (BAS),

University of Applied Sciences - Offenburg,

Riga Technical University,

VDE – Germany and

Leading Electronics Companies.

14th NATIONAL CONFERENCE WITH INTERNATIONAL PARTICIPATION ELECTRONICA 2023

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Ivan Yatchev – FNTS and CEEC*

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Seferin Mirtchev – CEEC
Georgi Mihov – BAS and TU - Sofia*

Scientific Secretary:

Dimitar Arnaudov – TU - Sofia

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**14-th NATIONAL CONFERENCE WITH INTERNATIONAL PARTICIPATION
“ELECTRONICA 2023”**

	Hour	Event
Wednesday 31 May	16.00-18.00	Registration of participants & test the system (Virtual room 1) Webex software
Thursday 1 June	9:00 – 10:00	Registration of participants Hall 4 & Virtual room 1
	10.00-10.30	Opening Session Hall 4 & Virtual room 1
	10.30-12.30	Scientific Session 1 Hall 4 & Virtual room 1
	12.30-13.00	Lunch break
	13.00-14.00	Workshop Opportunities for cooperation within the framework of the European University of Technology (EUt+) and business needs Presentation of projects (Part 1) & PhD students Workshop Hall 4 & Virtual room 1
	14.00-14.30	Coffee break
	14.30-16.30	Education in Electronics and Business Needs. Discussion with leading companies in electronics. Hall 4 & Virtual room 1
	16.30-18.00	„Alumni meeting”- Informal discussion Hall 3
Friday 2 June	08.30 -11.30	Scientific Session 2 (Part 1 & Part 2) Hall 3 & Virtual room 1
	11.30 -11.45	Coffee break
	11.45 -12.30	Keynote: Digital Healthcare and IoT Sri Krishnan, PhD, PEng, FCAE, Toronto Metropolitan University, Canada Hall 3 & Virtual room 1
	12.30 -13.00	Lunch break
	13.00-15.45	Scientific Session 3 Hall 3 & Virtual room 1
	15.45-16.00	Coffee break
	16.00 -18.15	Scientific Session 4 Hall 3 & Virtual room 1
	18.15 -18.30	Coffee break
	18.30 -19.30	Scientific Session 5 Hall 3 & Virtual room 1
19:30 – 20:00	Presentation of projects (Part 2)	
Saturday 3 June	9:00	Presentation of projects (Part 3), Closing Session & Social program

<https://e-university.tu-sofia.bg/e-conf/?konf=199>

[Virtual room 1](#) -

<https://technicaluniversityofsofia.my.webex.com/technicaluniversityofsofia.my/j.php?MTID=m9ae998964419b2c79cab3531339df54a>

Opening Session 10.00 - 10.30

Hall 4 & Virtual room 1, **Thursday 1 June 2023**

Scientific Sessions 1 10.30 -12.30

Hall 4 & [Virtual room 1](#), **Thursday 1 June 2023**

Workshop 13.00 – 14.00

Hall 4 & Virtual room 1, **Thursday 1 June 2023**



Opportunities for cooperation within the framework of the European University of Technology (EUT+) and business needs

- Technical University of Sofia, Bulgaria
- Riga Technical University, Latvia
- Assoc. Prof. Anna Litvinenko - Riga Technical University, Latvia
- Technical University of Cluj-Napoca, Romania
- University of Technology of Troyes (UTT), Troyes, France
- Prof. George Angelov - Technical University of Sofia, Bulgaria
- Assoc. Prof. Elica Gieva – Technical University of Sofia, Bulgaria

Presentation of projects (Part 1) & PhD students Workshop

- KII-06-IIH57/32, Hybrid and Fusion Prediction of The Functionality of Energy Converting Elements, Competition for financial support of basic research projects – 2021, SCIENTIFIC RESEARCH FUND
- KII-06-H57/7/16.11.2021, Artificial Intelligence-Based modeling, design, control, and operation of power electronic devices and systems, Bulgarian National Scientific Fund.
- KII-06-H37/25/18.12.2019, Optimal design and management of electrical energy storage systems, Bulgarian National Scientific Fund.

Discussion 14.30-16.30

Hall 3 & [Virtual room 1](#), **Thursday 1 June 2023**

Education in Electronics and business needs. Discussion with leading companies in electronics.

Increasing the Interest of High School Students to Scientific and Engineering Professions, Jordan Kolev, IEEE Bulgaria Section, LMAG Chair (Life Member Affinity Group)

Scientific Sessions 2, 3, 4, and 5 8.30-20.00

Hall 3 & [Virtual room 1](#), **Friday 2 June 2023**

Discussion on scientific projects.

Closing Session 3 June 2023 9.00

Scientific Session 1

Circuit and systems

Hall 3 & [Virtual room 1](#), Thursday 1 June, 10.30 – 12.30

Chairpersons: Ivo ILIEV, Ivo PANDIEV

- 1.1 Second order band-pass filter structure employing dynamic current scaling OTA based gyrators**
Georgi Georgiev

- 1.2 Method for Increasing Fast Response of the Operational Amplifiers with a Classical Input Differential Stage**
Darya Denisenko, Nikolay Prokopenko, Vladislav Chumakov, Marsel Sergeenko

- 1.3 Integer Division Algorithm for the Gaussian Filtering Module of FPGA Based Edge Detection**
Dimitre Kromichev

- 1.4 Edge detection: Exact Localization of Detected Contours**
Dimitre Kromichev

- 1.5 Analysis of RMI Interface Design through Simulations and Measurements**
Alexander Todorov, Katya Asparuhova

- 1.6 ARM and BLE-Enabled TPMS for Improved Safety in Automotive Applications**
Dimitar Vrachkov

- 1.7 Thermal Control of Active and Inductive Loads by Impedance Monitoring**
Georgi Georgiev, Valentin Mateev, Iliana Marinova

- 1.8 IoT-Based Electronic System for Measuring Microclimatic Parameters in Cattle Farms**
Snezhinka Zaharieva, Jordan Stoev, Teodora Petrova, Adriana Borodzhieva

- 1.9 Simulation Study of Integrated Transistor Circuits for CAD Training in Electronics Education**
Katya Asparuhova, Georgi Georgiev, Stanislav Asenov

Scientific Session 2

Instrumentation and Measurement, IoT Biomedical Engineering

Hall 3 & [Virtual room 1](#), Friday 2 June, 8.30 - 11.30

Chairpersons: Marin MARINOV, Georgi NIKOLOV

2.1. Reliability Evaluation of MEMS Pressure Sensors
Dimitar Nikolov, Borislav Ganev, Marin Marinov

2.2. Vibration-based loose component detection in automotive application
Vergil Djamiykov, Vasil Galabov, Dimitre Trendafilov, Borislav Ganev

2.3. Global Positioning of Optically Detected Objects with UAV
Stefan Hensel, Marin Marinov, Raphael Panter, Dimitre Trendafilov

2.4. LSTM Algorithm and IoT Data on Power Flow Forecast
Arbër Perçuku, Daniela Minkovska

2.5. Ultimate Execution Speed of Gaussian Filtering in FPGA Based Gradient Edge Detection
Dimitre Kromichev

2.6. Autonomous human presence solar energy harvesting sensor node for IoT applications
Stanislav Asenov, Dimitar Tokmakov, Katya Asparuhova, Hristo Kanevski, Daniela Shehova

2.7.

2.8.

2.9. Novel Design for Torque Control of a Robotic Arm
Babak v, Alireza Savabkar, Ali najari, Majid Serajchi, Mohammadjavad Haghghatseresht

2.10. Human Presence Detection In Smart Homes Using Local Wireless Network
Khatereh Jabari, Saeed Izadi, Saeed Izadi, Mahnaz Izadi, Bagher Khadem Hamedani

2.11. Coronary Heart Diseases Detection using Stacking Based Ensemble with Emperor Penguin Optimization Approach
Prince Rajor, Indu Singh, Prasoon Jha, Prateek Singh

2.12. Modeling and Identification of Biotechnological Systems Using Knowledge Processing Systems
Maria Nenova, Valeria Nenova, Anelia Tzanova, Marian Hristov

2.13. Rehabilitation device with rotary pneumatic actuator
Ivanka Veneva, Pavel Venev, Georgi Katsarov, Silvia Angelova

2.14. Combined High-Pass and Mains Interference Rejection Filter
Georgy Mihov, Dimiter Badarov

Scientific Session 3

Power and Industrial Electronics

Hall 3 & [Virtual room 1](#), Friday 2 June, 13.00 - 15.45

Chairpersons: Tsvetana GRIGOROVA, Nikolai HINOV

3.1. Basic Characteristics of an Optimal Trajectory Controlled LLC Resonant DC-DC Converter at Continuous Current Mode
Aleksandar Vuchev, Tsvetana Grigorova, Stoyan Vuchev

3.2. Modeling of an Optimal Trajectory Controlled LLC Resonant DC-DC Converter
Aleksandar Vuchev, Tsvetana Grigorova

3.3. Supercapacitor energy storage system discharge strategies considering discharge power levels and DC grid voltage drop
Ģirts Staņa, Kaspars Kroics

3.4. PMSM Servomotor Performance Improvement with GaN based Inverter and Sinusoidal Filter
Kaspars Kroics

3.5. Analytical Calculation of Differential Mode and Common Mode EMI Filters
Jānis Voitkāns, Kaspars Kroičs

3.6. Modeling of a Photovoltaic Plant for a Charging Station for Electric Vehicles with the Possibility of Feeding Excess Energy into the Power Grid
Gergana Vacheva, Andrei Borisov, Nikolay Hinov

3.7. Study of the Influence of Parasitic Components in Inverter Drives
Gergana Vacheva, Plamen Stanchev, Nikolay Hinov

3.8. Analytical, Simulation and Experimental Investigation of the Phase Inductance Profile of a Three-Phase 12/8 SRM
Dimitar Yankov, Ivan Maradzhiev

3.9. Comparative analysis of control algorithms for a power source - power converter - switched reluctance motor system in generator mode

Dimitar Yankov, Ivan Maradzhiev

3.10. Laser surface texturing LST overview, future trends, advantages, and disadvantages

Elena Nikolova

3.11. A Novel Bidirectional Flying Inductor Inverter Topology

Yovko Rakanov

3.12. Fuzzy logic control of Buck converter

Hristiyan Kanchev, Kiril Genev, Nikolay Hinov

3.13. New method of testing in electronics manufacturing

Roumen Bagalev, Lyudmila Taneva, Pavel Dzhunev

3.14. Reliability and fault-tolerance of PV modules on Northern Greece

Theodoros Petroglou

3.15. Replacing the coefficient of the PID controller with a mathematical function

Goran Goranov, Petar Panayotov

3.16. Mathematical model for automatic calibration of nonlinear sensors

Petar Panayotov, Goran Goranov, Anatoliy Aleksandrov

Scientific Session 4

Information and Communication Technology

Hall 3 & [Virtual room 1](#), Friday 2 June, 16.00 - 18.15

Chairpersons: Nikolay HINOV, Dimitar ARNAUDOV

4.1. A Service Based Approach to Machine Learning Workflow in O-RAN

Ivaylo Atanasov, Evelina Pencheva, Ventsislav Trifonov

4.2. Notification mechanism for malware detected by Microsoft Defender for IoT in industrial networks

Marian Hristov, Maria Nenova, Viktoria Dimitrova, Zlatka Valkova Jarvis

4.3. Safe Guarding Social Network: An Exploration of Advance Cryptographic Algorithms for Ensuring Data Security and Integrity

Ramesh Kumar, S. P. Singh, Hitesh Singh, Vivek Kumar, Boncho Bonev

4.4. A Circular Polarized Flexible Antenna for Energy Harvesting from Sources in 2.4 GHz ISM Band

Gabriela Atanasova, Blagovest Atanasov, Nikolay Atanasov, Manol Avramov, Nikolay Hristov, Nikolay Dishovsky

4.5. Implementation of Public Key Code System Based on Polar Codes on a Minicomputer
Nahid Izadi, Mohammad Jabari, Ali Najari, Masoud Izadi, Maryam Jabbari

4.6. Improved Gray Wolf Algorithm for Scheduling Workflow in Cloud Computing Environment

Masoud Izadi, Mohammad Jabari, Ali Najari, Nahid Izadi, Maryam Jabbari

4.7. Lightweight Portable Environment for Building Visual Studio Projects (Solutions) and C/C++ Sources without Visual Studio

Berik Tuleuov, Ademi Ospanova, Akzhol Tussipkhanov, Aizhan Shegetaeva

4.8. Improving Credit Card Fraud Detection through a Hybridized Approach: Squirrel Search - Honey Badger Algorithm, Optimized Neural Network, and Weighted SMOTE

Indu Singh, Prashubh Atri , Pranav Goyal , Pranav Bhatnagar

4.9. Multi-Resource Inventory Management

Todor Stoilov

4.10. Magical Ordering of Cards with the use of Computers

Serafeim Triantafyllou

4.11. Investigating the feasibility of using infrared thermography as a research tool for the relationship between the temperature-humidity index and the surface temperature of the skin in the flank and udder area of dairy cows

Hristo Hristov, Kalin Dimitrov, Toncho Penev

4.12. A Software Method for Short-Term Forecasting of the Output Power of a Wind Turbine for the City of Sofia

Alina Fazylova, Григор Михайлов

4.13. A smart classroom model implemented with the Internet of Things

Emil Delinov, Daniela Orozova, Zhelyazko Terziyski, Nadezhda Angelova

4.14. Electrical circuit modelling of FBAR in Cadence Virtuoso

Milena Sirakova

Scientific Session 5

Advanced materials & Electromobility

Hall 3 & [Virtual room 1](#), Friday 20 May, 18.30 - 19.30

Chairpersons: Valentin KAMBUROV, Alexander ZAHARIEV

**5.1. Electrochemical investigation of the insulating properties of complex anodic layers
Alexander Zahariev**

**5.2. Wet-Chemical Fabrication of MeOx/TiO₂-based Sensors on a Glass via UV
Bozhidar Stefanov**

**5.3. Determination of stress-strain relationships in three-point bending tests verified by
simulation modelling
Valentin Kamburov, Antonio Nikolov, Rayna Dimitrova**

**5.4. 3D-printed UV Exponator Setup with Arduino-based Automated Irradiation Dose
Control
Pavel Venev, Bozhidar Stefanov**

**5.5. How to improve the cross-team collaboration in large scale agile organizations by using
AI and ML algorithms
Nikola Gaydarov, Roumiana Ilieva, Atanas Tonchev**

**5.6. Conversing to Electrical Car
Dimitar Arnaudov, Valentin Mishev, Hristo Batchvarov**

Presentation of projects (Part 1)

Hall 3 & Virtual room 1

Hall 3 & [Virtual room 1](#), Friday 2 June, 19.30

Closing Session & Presentation of projects (Part 2)

Hall 3 & Virtual room 1

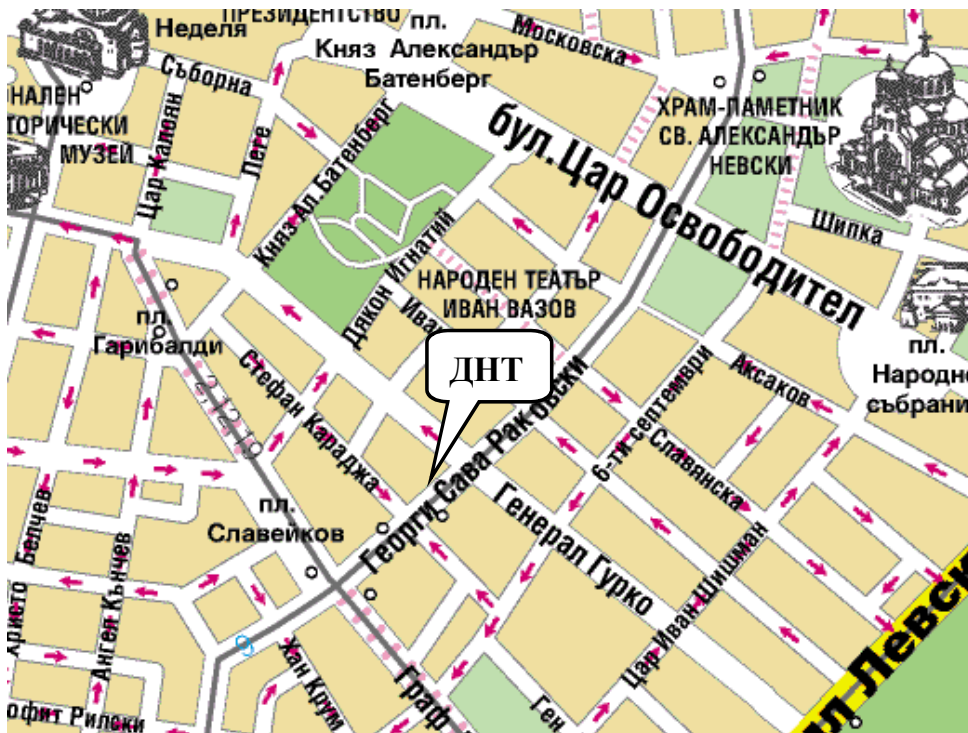
Hall 3 & [Virtual room 1](#), Friday 3 June, 9.00

INFORMATION

ELECTRONICA 2023 is technically Co-Sponsored by IEEE.

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The accepted and presented papers will be published in the conference Proceeding on CD and submitted to IEEE Xplore Digital Library, Scopus database.



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