

20-21 OCTOBER, 2022

THE 12-TH EDITION, CHISINAU MD



# IC ECCO 2022

## THE CONFERENCE PROGRAM AND ABSTRACT BOOK



Electrofizica



12th International Conference  
on Electronics, Communications  
and Computing

**Technical University of Moldova**

The 12th International Conference on Electronics,  
Communications and Computing (IC ECCO-2022):  
The conference program and abstract book

*Conference organized by*

**Technical University of Moldova**

**Computer, Informatics and Microelectronics Faculty  
Electronics and Telecommunications Faculty**

*in cooperation with*

Academy of Science of Moldova  
Information Technology and Cyber Security Service  
Information Society Development Institute

**Chişinău, Moldova**  
October 20-21, 2022

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The program contains the timetable of the plenary and conference sessions of the 12th International Conference on Electronics, Communications and Computing.



## About IC ECCO

The conference aims at bringing together scientists and engineers dealing with fundamental and applied research for reporting on the latest results and achievements in the fields involved.

The conference is organized by the Technical University of Moldova in cooperation with the Academy of Sciences of Moldova, the Information Society Development Institute and the Information Technology and Cyber Security Service.

IC ECCO 2022 program consists of invited and contributed papers. The presentation should not exceed 15 minutes (contributed papers) and 30 minutes (plenary papers). The program is organized into tracks of related subjects. The official language of the conference is English.

The organizers will send an invitation for online meetings based on MS Teams. Each track will have its channel, and each topic will be realized in a separate meeting. All meetings will be created by organizers.



*In 1967, the Faculty of Electrophysics, the forerunner of the "Computers, Informatics and Microelectronics" and "Electronics and Telecommunications" faculties, was founded. Hence all our friends are welcome in this conference edition to celebrate our 55th anniversary.*

## CONFERENCE CHAIRMEN

**Dumitru Ciorbă, assoc. prof., dr.**  
Dean of Computers, Informatics  
and Microelectronics Faculty

**Pavel Nistiriuc, assoc. prof., dr.**  
Dean of Electronics and  
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*Rector of the Technical University  
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**Ion Tighineanu,  
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*President of the Academy of  
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## CONFERENCE TRACKS

	Track 1	Track 2	Track 3	Track 4
Venues	A2	3-3	A4	A1
DAY 1 - 20 October	Plenary talks (Tekwill)			
	Biomedical engineering	Software engineering and Cybersecurity		Management&Marketing and ICT
DAY 2 - 21 October	Electronics	Computer science	Computer Engineering Communications	Knowledge-based society
	24 Speakers	23 Speakers	9 Speakers	14 Speakers

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*vicerector Technical University of Moldova*  
*IC MCS Founder, professor, dr., Technical University of Moldova*  
*IC TEI Founder, assoc. prof. dr., Technical University of Moldova*

## OPENING CEREMONY

Tekwill ICT Excellence Center, IMAGINARIUM – Studenților str. 9/11

09:00	Speaker	08:00 - Registration	OPENING CEREMONY
	Viorel Bostan	Rector, Technical University of Moldova, <i>professor, dr. hab.</i>	
	Iurie Țurcanu	Deputy Prime Minister for Digitization	
	Ion Tighineanu	President Academy of Sciences of Moldova, <i>acad., professor, dr. hab.</i>	
	Mihai Dimian	Vice-Rector, <i>Stefan cel Mare</i> University of Suceava, Romania, <i>professor, dr. hab.</i>	
	Gheorghe Pantaz	Director, Information Technology and Cybersecurity Service	
	Alexandru Ciubuc	Chief Executive Officer, Moldtelecom	
	Evghenii Galamaga	Director Representative in Moldova, Allied Testing	

## VENUES



Tekwill, Studenților 9/11  
Imaginarium



TUM, Studenților 9/7,  
Building nr. 3, FCIM





**PLENARY SESSION**[HTTPS://ECCO.UTM.MD/](https://ECCO.UTM.MD/)**DAY 1****Session chairmen****20 OCTOBER 2022**

prof., dr. hab., Oleg Lupan  
 assoc. prof., dr. Dumitru Ciorbă

	Speaker	PLENARY SESSION
09:30	Victor Şontea	Electrophysics faculty at 55th anniversary
10:00	Reiner Adelung	Porous materials for electrical gas sensors and actuators without moveable parts
10:30	COFFEE BREAK	
11:00	Mihai Dimian	Hybrid wireless vehicular communications and information technologies for vehicle safety and driver assistance
11:30	Ion Ţurcanu	Enabling connected mobility via reliable and low-latency communication
12:00	Oleg Lupan	Nanosensors and Sensors Based on Heterostructured Materials for Safety and Biomedical Applications
12:30	Dorin-Mircea Popovici	Mixed Reality Technology in Support of Cultural Heritage

**DAY 1: TRACK 1**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK1/](https://ECCO.UTM.MD/ECCO22-TRACK1/)**Room A2****BIOMEDICAL ENGINEERING****Domain**

Biomaterials for medical applications; Biomedical instrumentation; Biomedical imaging and image processing; Medical physics and biophysics; Molecular, cellular and tissue engineering; Clinical engineering, health technology management and assessment; Health informatics, e-health and telemedicine; Biomedical engineering education; Innovation, development and interdisciplinary research; Nuclear and radiation safety and security.

**Session chairman**

prof. dr. Victor Şontea

assoc. prof. dr. hab. Artur Buzdugan

**Program Committee members**

prof. dr. Călin Corciova (România)

	<b>Speaker</b>	<b>BIOMEDICAL ENGINEERING</b>
14:00	Anatolie Sidorenko	Spintronic Functional Nanostructures for Artificial Neural Network
14:15	Gheorghe Gorceag	Effective Management Of Medical Technologies For A Functional Health System
14:30	Victor Iapascurta	Dealing With Missing Continuous Biomedical Data: a Data Recovery Method for Machine Learning Purposes
14:45	Kostyantyn Kolisnyk	Features of Application of the Experimental Stand for Reception of the New Measuring Information Concerning Morphological Signs of An Erythrocyte
15:00	Ludmila Sidorenko	New Biophysical Approach in Analysis of Heart Rate Variability for Increasing its Predictive Value
15:15	COFFEE BREAK	

	Speaker	BIOMEDICAL ENGINEERING
15:30	Guy Attia	New Biotechnological Opportunities to Assess the Influence of Lifestyle Factors in Obesity
15:45	Anatolie Iacob Baci	Arousal from sleep, alertness induced by bimodal signals during “environment-person” communication
16:00	Erez Arad	Recent Biotechnological Approach to Genetically Determined Atrial Fibrillation
16:15	Ilan Davidov	Biotechnological Tools in Genetics for Primary Prophylaxis of Essential Arterial Hypertension
16:45	Balabanov Anatolii	Information support of the processes of diagnosis and surgical treatment of chronic subdural hematoma of the brain

**DAY 2: TRACK 1**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK1/](https://ECCO.UTM.MD/ECCO22-TRACK1/)**Room A2****ELECTRONICS****Domain**

Applied Electronics and Embedded Systems;  
Micro & Nano-electronics

**Session chairman**

prof. dr. hab. Oleg Lupan

prof. dr. hab. HDR Thierry Pauporté (France)

**Program Committee members**

assoc. prof. dr. Serghei Railean

assoc. prof. dr. Tatiana Şestacova

	Speaker	ELECTRONICS
9:00	<b>Invited speaker</b> Alexander Vahl	Nanoparticle beam deposition methods for functional electronics
9:20	<b>Invited speaker</b> Stefan Schröder	Initiated chemical vapor deposition of tailored polymer thin films for electronic applications
9:40	<b>Invited speaker</b> Vardan Galstyan	Synthesis and chemical gas sensing properties of WO <sub>3</sub> nanomaterials
10:00	<b>Invited speaker</b> Salih Veziroglu	Functional Metal Oxide Surfaces: Photocatalytic, Self-Cleaning, Sensing, and Micro-/Nanostructuring Applications
10:20	Cristian Lupan	The Reliability to Gamma Radiation of Gas Sensors Based on Nanostructured ZnO:Eu
10:35	Nicolae Secieru	The evaluation of the on-board computer architecture for TUMnanoSAT series of nanosatellites for carrying out missions
11:00	COFFEE BREAK	

	Speaker	ELECTRONICS
11:30	<b>Invited speaker</b> Leonard Siebert	CuO-plate decorated ZnO nanostructures and their sensing performances
11:45	<b>Invited speaker</b> Jan Martin Wagner	Recent trends in solar cell development and characterization - an overview
12:00	Valentin Oleschuk	Algorithms of Overmodulation Regulation of Neutral Clamped Inverters for Photovoltaics
12:15	Vladimir Jdanov	Microprocessor Relay Protection LIRA Based on Amplitude-Phase Measurements of Signals
12:30	Valeri Verjbitki	The method of measuring the parameters of nanostructured sensors
12:45	Maria Lupu	Prospects Overview of the Superconducting Neural Networks
13:00	Vladimir Boian	Determination of the critical thickness of Nb superconducting layers coupled proximity with Co
13:15	Ion Avram	Active Filter on RC element with Distributed Parameters Sensitivity Analyze
13:30	Vitalie Secieru	LED Grow Lights

**DAY 1: TRACK 2**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK2/](https://ECCO.UTM.MD/ECCO22-TRACK2/)**Lecture Hall 3-3****Software Engineering and Cybersecurity****Domain**

Methods and Tools of Software Engineering; Information Systems and Applications; Computer Security and Cryptography; Security and Privacy in Computing and Communications;

**Session chairman**

prof. dr. hab. Ion Bolun

**Program Committee members**

prof. dr. Panayotis Yannakopoulos (Greece)

prof. dr. Victor Beşliu

	Speaker	SOFTWARE ENGINEERING AND CYBERSECURITY
14:00	Ion Bolun	A Differentiated Beneficiary Cybersecurity Approach
14:20	<b>Invited speaker</b> Nistor Grozavu	Multi-modal multi-view emotion detection using non-negative matrix factorisation
14:40	<b>Invited speaker</b> Ferucio Laurentiu Tiplea	Privacy and Mutual Authentication under Temporary State Disclosure in RFID Systems
15:00	Alexandra-Ina Butnaru	Attribute-Based Encryption for Weighted Threshold Access Structures
15:15	<b>COFFEE BREAK</b>	
15:15	Victoria Bobicev	An Interface for Phonosemantic Assessment of Russian Words

	Speaker	SOFTWARE ENGINEERING AND CYBERSECURITY
15:45	Ștefan-Gheorghe Pentiu	Analysis with Unsupervised Learning Based Techniques of Load Factor Profiles and Hyperspectral Images
16:00	Nina Sava	State of water quality in the Prut River for the period of 2019-2021
16:15	Denisa-Ionela Țiflea	Vulnerabilities of LRSAS Protocol

	Speaker	COMPUTER SCIENCE
16:30	Vasile Moraru	A Method for Binary Quadratic Programming with circulant matrix
16:45	Daniela Istrati	A Brief Overview of Intelligent Interfaces in Production Systems

**DAY 2: TRACK 2**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK2/](https://ECCO.UTM.MD/ECCO22-TRACK2/)**Lecture Hall 3-3****Computer science****Domain**

Mathematical Modelling and Applications; Algorithms and Computing Theory;  
Data Science/Engineering; Artificial Intelligence; Bioinformatics

**Session chairman**

prof. dr. Alexei Leahu

**Program Committee members**

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assoc. prof. dr. Valeriy Fratachan (Ukraine)

prof. dr. Vasile Moraru

assoc. prof. dr. Galina Marusic

assoc. prof. dr. Victoria Bobicev

	Speaker	COMPUTER SCIENCE
9:00	<b>Invited speaker</b> Radu-Daniel Vatavu	Designing Interactive Computer Systems within the Framework of Sensorimotor Realities
9:20	<b>Invited speaker</b> Serghei Mangul	Developing bioinformatics capacity in Moldova
9:40	Emilian Guțuleac	Performability Modeling of Self-Adaptive Systems Based on Extension Neural Rewriting Stochastic Petri Nets
9:55	Alexei Leahu	Graphical methods as a complements of analytical methods used in the research of dynamic models for networks reliability
10:10	Veaceslav Perju	Evaluation of the Multi-Algorithms Targets Recognition Systems



	Speaker	COMPUTER SCIENCE
10:25	Rares Radu	Comparing two security models for RFID
10:40	Valeriu Fratavecan	Pseudo Genetic Algorithm of Clustering For Linear and Ellipsoidal Clusters
11:00	<i>COFFEE BREAK</i>	
11:30	Ion Geru	Application of the Schwinger's oscillator model of angular momentum to quantum computing
11:45	Mario Lefebvre	An Inverse Stochastic Optimal Control Problem
12:00	Maksym Zylevich	Reduction programming in a technological programming environment
12:15	Andrei Enachi	Human Motion Recognition Using Artificial Intelligence Techniques
12:30	Alexandru-Ionuț Șiean	A Set of Smart Ring Gestures for Drone Control
12:45	Yaroslav Drin`	The first boundary value problem for the nonlinear equation of heat conduction with deviation of the argument
13:00	Victor Iapascu	Kolmogorov-Chaitin Algorithmic Complexity for EEG Analysis

**DAY 2: TRACK 3**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK3/](https://ecco.utm.md/ecco22-track3/)**Room A4**

## Computer engineering Networks and Communications

**Domain**

Automatic Control; Robotics; Computer design;

Telecommunications: Technology, Networks and Software; Electronics and Telecommunications: Operations, Administration and Maintenance; IoT Technologies: Software, Hardware and Connectivity; IT infrastructure and Cloud Computing

**Session chairwoman**

assoc. prof. dr. Viorica  
Sudacevschi

**Program Committee members**

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prof. univ. dr. Ștefan-Gheorghe Pentiuc (România)  
assoc. prof. dr. Ion Fiodorov,  
lect. dr. Andrei Dorogan (Moldova),  
prof. dr. ing. Dan Laurentiu Milici (România)

	Speaker	COMPUTER ENGINEERING
9:00	<b>Invited speaker</b> Mihail Iacob	The choice of DVB-T2 signal transmission technology in the shadow areas of the Republic of Moldova
9:20	Irina Cojuhari	The PID Tuning Procedure for Performance Optimization of the Underdamped Second-Order Processes
9:40	Adrian Secrieru	Tuning the PID Controller to the Object Model with Second-Order Inertia with Identical Elements and Time Delay by the Modified Polynomial Method

	Speaker	COMPUTER ENGINEERING
10:00	Tatiana Sestacova	Analysis of code sequences for multichannel data transmission systems
10:20	Vladimir Melnic	Tuning the Fuzzy Controller for Speed Control of the DC Motor
11:00	<i>COFFEE BREAK</i>	
11:30	Viorel Cărbune	Design of Specialized Hardware Architectures for Industry 4.0
11:45	Silvia Munteanu	Multi-Objective Optimal Solution Search based on Genetic Algorithms
12:00	Andrei Dorogan	Smart Lift – Intelligent lift service system
12:15	Ana Țurcan	Decision Making System based on Collaborative Agents

**DAY 1: TRACK 4**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK4/](https://ecco.utm.md/ecco22-track4/)**Room A1****Management&Marketing and ICT****Domain**

Management and Marketing in the ICT; ICT in the Management and Marketing; eGovernment and Society; Digital economy.

**Session chairwoman**

assoc. prof. dr. Lilia Sava

**Program Committee members**

prof. dr. Gabriel Brăticu (România)  
prof. dr. hab. Victoria Ganea

	Speaker	MANAGEMENT&MARKETING AND ICT
14:00	Dinu Țurcanu	Website performance analysis in relation to the Visibility indicator of the Webometrics ranking; case study TOP 5 universities from the Republic of Moldova & Romania
14:20	Rodica Siminiuc	Role of the University Management System in the digitalization of Technical University of Moldova
14:40	Lilia Sava	Activation of attraction processes of investments into national economy through capital market
14:55	Valentina Tîrșu	Microfinance organizations under conditions of crisis and uncertainty
15:15	COFFEE BREAK	

**DAY 1: TRACK 4**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK4/](https://ECCO.UTM.MD/ECCO22-TRACK4/)**Room A1****DIGITAL TOOLS FOR A COMPETITIVE ECONOMY****WORKSHOP**

The *Digital Tools For A Competitive Economy* aims to initiate how information and communication technologies can be used as advantageous and timely sources for economic and social development.

**Session chairwoman**

assoc. prof. dr. Lilia Sava

<b>15:45</b>	<b><i>Special quests</i></b>	<b>DIGITAL TOOLS FOR A COMPETITIVE</b>
	Larisa Dunai (Spain)	Globalization and technological change - are the basis of a new world economy "driven by technology, fueled by information and driven by knowledge.
	Constantin Roşioru	Such workshops are proposed to discuss solutions for process automation, improving business tools, facilitating the use of e-commerce and sales tools, comes to support innovative thinking, and creating useful services and digital products for many industries.

**DAY 2: TRACK 4**[HTTPS://ECCO.UTM.MD/ECCO22-TRACK4/](https://ECCO.UTM.MD/ECCO22-TRACK4/)**Room A1****Knowledge-based society****Domain**

Research and Education for Knowledge-based Society; E-didactics & education methods based on ICT

**Session chairwoman**

assoc. prof. dr. Natalia Burlacu

**Program Committee members**

assoc. prof., dr. Ecaterina Lozovanu  
assoc. prof. dr. Mihai Braga

	Speaker	KNOWLEDGE-BASED SOCIETY
9:00	Natalia Burlacu	EdTech: Concept and Connections
9:30	Viorica Sudacevschi	Implementation of dual education at Technical University of Moldova
10:00	Ecaterina Lozovanu	Comprehension, Possibility and Death. The Justification of the Ontological Understanding of Death
10:30	Maria Guțu	Improving the Informatics Competencies Through Assessment for Learning
11:00	COFFEE BREAK	
11:30	Elena Gogoi	Exploring PBL as a New Learning Context in Engineering Education
11:50	Leon Brânzan	Non-linguistic Thinking as an Effective Tool for Innovation in Education
12:10	Dina Barcari	Digitalization of religion as a reaction to the pandemic crisis
12:35	Lidia Sabău	The impact of the COVID-19 pandemic on the financial education of primary school students