



4th IEEE International Conference on Advanced Information and Communication Technologies (AICT) - 2021

in partnership with



Lviv city
council



Conference Program

Lviv, Ukraine
September 21-25, 2021

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- IEEE Ukraine Section
- IEEE Ukraine Section COM Society Chapter
- Lviv Polytechnic National University, Ukraine
- Korea University, South Korea
- Technical University of Kosice, Slovakia

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CONFERENCE SECTIONS

Section ID	Section Title	Number of accepted papers
S1	Information and Communication Systems: Theory and Applications	14
S2	Internet of Things: Technologies and Applications	13
S3	Artificial Intelligence and Machine Learning	19
S4	Future Information and Communication Systems	8
S5	Cybersecurity and Blockchain	9
ACCEPTED PAPERS, TOTAL		63
SUBMITTED PAPERS, TOTAL		106
ACCEPTANCE RATE		0,59

TIME LIMITS

Plenary session: up to 45 min	Regular sessions: up to 15 min
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PROGRAM AT A GLANCE

September 21 Tuesday	9:00-9:30	Opening Remarks
	9:30-10:15	Keynote Speech 1
	10:15-12:00	Regular Session S1.1
	12:00-12:15	Coffee Break
	12:15-14:00	Regular Session S1.2
	14:00-14:30	Lunch Time
	14:30-16:15	Regular Session S2.1
	16:15-16:30	Coffee Break
	16:30-18:00	Regular Session S2.2
September 22 Wednesday	10:00-10:45	Keynote Speech 2
	10:45-12:00	Regular Session S3.1
	12:00-12:15	Coffee Break
	12:15-13:30	Regular Session S3.2
	13:30-14:00	Lunch
	14:00-15:15	Regular Session S3.3
	15:15-15:30	Coffee Break
	15:30-16:30	Regular Session S3.4
	16:45-18:00	Reserved Session
September 23 Thursday	10:00-10:45	Keynote Speech 3
	10:45-11:45	Regular Session S4.1
	11:45-12:00	Coffee Break
	12:00-13:00	Regular Session S4.2
	13:00-14:00	Lunch
	14:00-15:15	Regular Session S5.1
	15:15-15:30	Coffee Break
	15:30-16:30	Regular Session S5.2
	16:45-18:00	Reserved Session
September 24 Friday	10:00-11:00	Conference Final Session

CONFERENCE OPENING

Tuesday, September 21

9:00 – 9:30

[Link to the online meeting](#)

Opening Remarks

1.	<i>Ivan Demydov, Vice-Rector of Lviv Polytechnic National University</i>
2.	<i>Minho Jo, Korea University</i>
3.	<i>Mykhailo Andriychuk, IEEE Ukraine Section Chapter Coordinator</i>
4.	<i>Mykhailo Klymash, Lviv Polytechnic National University, Conference Chair, Chairman of the IEEE Ukraine Section COM Society Chapter</i>

KEYNOTE SPEECH

Tuesday, September 21

9:30 – 10:15

[Link to the online meeting](#)

1.	<i>Andriy Luntovskyy, BA Dresden</i> Green IT: Efficiency and Performance Parameters
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S1.1: Information and Communication Systems: Theory and Applications

Tuesday, September 21

10:15 – 12:00

[Link to the online meeting](#)

Chair:
Prof. Andriy Luntovskyy

1.	<i>Svitlana Kiiko, Olena Mazurkiewicz and Volodymir Baliar</i> Model of Spatial-Frequency Characteristics of Video Application
2.	<i>Yuliia Pyrih, Oksana Urikova, Bohdan Strykhalyuk, Yaroslav Pyrih and Olena Hordiichuk-Bublivska</i> Increased Automation of Trading on the Basis of Software-Based Registrars of Settlement Transactions
3.	<i>Roman Melnyk, Yurii Havrylko and Mariia Levytska</i> Defects Detection in PCB with Ground Plane by Clustering and Flood-fill Algorithms
4.	<i>Bratiuk Pavlo</i> A New Aspect in Solving Problems Increase Energy Efficiency and Noise Immunity Information Transmission Systems
5.	<i>Oleksandr Lavrynenko, Roman Odarchenko, George Konakhovych, Anatolii Taranenko, Denys Bakhtiarov and Tatiana Dyka</i> Method of Semantic Coding of Speech Signals based on Empirical Wavelet Transform
6.	<i>Bohdan Yavorskyy</i> Representation of Quantum Signal Simulating
7.	<i>Vasyl Sheketa, Volodymyr Pikh, Yulia Romanyshyn, Vitaliy Melnyk, Volodymyr Protsiuk and Nadiia Pasieka</i> Formal Metastructures for Technological Problems Comparators Substantiation

S1.2: Information and Communication Systems: Theory and Applications

Tuesday, September 21

12:15 – 14:00

[Link to the online meeting](#)

Chair:
Prof. Mykhailo Klymash

1.	<i>Evgeniy Lavrov, Olga Siryk, Yana Chibiriak, Liliana Danilova, Volodymyr Nahornyi and Svetlana Vakal</i> A Model for the Organization of Adaptive Dialogue Interaction "Man-Computer", Taking into Account the Requirements of Reliability and Efficiency
2.	<i>Vladimir Barannik, Natalia Barannik, Yurii Babenko, Victoriya Himenko and Vitaliy Tverdokhlib</i> Method of Coding Dynamic Sequence of Frame-Spline Structures of Provided Frames in Info-Communications
3.	<i>Alexander Shmat'ko, Victoria Mizernik, Yevhen Odarenko, Nataliia Shevchenko and Nina Butenko</i> Narrow Band Filtering on the Base of Tunable Magnetophotonic Crystal
4.	<i>Oleg Riznyk, Ivan Tsmots, Yurii Noga and Olga Myaus</i> Development of Adaptive Coding Means, Decoding of Data in Real Time Using Barker-Like Codes
5.	<i>Dmytro Havrylov, Valerii Yeroshenko, Roman Onyshchenko, Kateryna Zakomorna, Maksym Savchuk and Oleksandr Karaban</i> Possible Ways of Video Processing at the Quantization Stage
6.	<i>Damir Kalimullin and Anatoliy Popov</i> Two-Dipole Model Based Coherent Radar Target Decomposition
7.	<i>Oleksandr Martynyuk, Oleksandr Drozd, Anatoliy Sachenko, Hanna Stepova, Bui Van Thuong and Dmitry Martynyuk</i> Model for Verification of Agent Commutations of Distributed Multiagent Systems

S2.1: Internet of Things: Technologies and Applications

Tuesday, September 21

14:30 – 16:15

[Link to the online meeting](#)

Chair:
Dr. Pinar Kirci

1.	<i>Saruhan Furkan Senturk, Muhammet Fatih Donmez, Huseyin Kaan Gulmez, Mehmet Faruk Gul and Pinar Kirci</i> A Low-Cost Intelligent Metal Recycling Machine
2.	<i>Sezayi Kaya, Oguzcan Gorucu and Pinar Kirci</i> Smart Home Automation System
3.	<i>Bohdan Rusyn, Yuriy Obukh, Rostyslav Kosarevych, Oleksiy Lutsyk and Valentyna Korniy</i> Information System for Analysis of Forest Plantations and Monitoring of Ecological Condition
4.	<i>Anatoliy Lozhkovskiy, Mykhailo Klymash, Yuliia Pyrih and Olga Shpur</i> Method for Evaluating the Quality of Service Characteristic of a Packet Access Network for IoT Devices
5.	<i>Davut Arslan, Süreyya Fatih Dinçer and Pinar Kirci</i> A Mobile Application About Earthquake to be Used Before and After a Disaster
6.	<i>Vladimir Krizhanovski, Vasyi Komarov, Sergii Serhiienko and Volodymyr Kryzhanovskiy</i> Application of Allan Variance for Data Control in Sensor Networks
7.	<i>Sergiy Zagorodnyuk, Bohdan Sus, Anton Komisarov and Oleksandr Bauzha</i> Access control and management system over Real Estate Objects as a part of IoT network community

S2.2: Internet of Things: Technologies and Applications

Tuesday, September 21

16:30 – 18:00

[Link to the online meeting](#)

Chair:
Dr. Taras Maksymyuk

1.	Syed Umaid Ahmed, Muhammad Ali Haider and Hamza Khalid Monitoring of Solar Power Plants through Drone
2.	<i>Yuri Onykiienko, Pavlo Popovych, Anastasiia Mitsukova, Anna Beldyagina and Roman Yaroshenko</i> LoRa Evaluation for University Campus in Urban Conditions
3.	<i>Igor Safronov, Taras Kazemirskiy and Andrii Samila</i> Development of hardware for digital control system of pulsed NQR spectrometer
4.	<i>Evgeniy Lavrov and Yan Voitsekhovskiy</i> Modeling the processes of occurrence and elimination of errors in automated man-machine control systems
5.	<i>Manuel Schappacher, Amrut Dant and Axel Sikora</i> Implementation and Validation of LoRa-Based Systems in the 2.4 GHz Band
6.	<i>Andrii Kanovskyi, Oleksandr Osolinskyi, Hrystyna Lipyanina-Goncharenko and Anatoliy Sachenko</i> A concept of microprocessor-based electrical load control system with extended functionality

KEYNOTE SPEECH

Wednesday, September 22

10:00 – 10:45

[Link to the online meeting](#)

1.	<i>Dr. Oleksandr Karpin, Infineon Technologies</i> Connecting the Real and the Digital World: Challenges and Solutions
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S3.1: Artificial Intelligence and Machine Learning

Wednesday, September 22

10:45 – 12:00

[Link to the online meeting](#)

Chair:

Dr. Taras Maksymyuk

1.	<i>Sergiy Sveleba, Ivan Katerynychuk and Ivan Kuno</i> Investigation of the Transition Mechanism to Chaos in Multilayer Neural Networks
2.	<i>Serhii Leoshchenko, Andrii Oliinyk, Sergey Subbotin and Mykyta Zaiko</i> Mechanisms of fine tuning of neuroevolutionary synthesis of artificial neural networks
3.	<i>Mykhailo Klymash, Maryan Kyryk, Ivan Demydov, Olena Hordiichuk-Bublivska, Halyna Kopets and Nazar Pleskanka</i> Research on Distributed Machine Learning Methods in Databases
4.	<i>Maksim Iavich, Giorgi Iashvili, Avtandil Gagnidze and Roman Odarchenko</i> Use of Content-Filtering Method for Hardware Vulnerabilities Identification System
5.	<i>Aidiye Aidarbekov, Gulmira Shakhmetova and Kamshat Asmaganbetova</i> Informational Technologies in Film Production - How ICT shaping Media Industry

S3.2: Artificial Intelligence and Machine Learning

Wednesday, September 22

12:15 – 13:30

[Link to the online meeting](#)

Chair:
Dr. Yulia Pyrih

1.	<i>Valerii Lovkin, Andrii Oliinyk, Tetiana Fedoronchak and Yurii Lukashenko</i> Information Model of Outdoor Air Pollution Prediction for Medical Diagnosis System
2.	<i>Stanislav Berezovsky</i> Ontology 3D Noon-Models of Switching Patterns on Elements by Berezovsky
3.	<i>Kateryna Polibina</i> Model of Supporting an Individual Training Pathway for Software Engineers
4.	<i>Ihor Pilkevych, Dmytro Fedorchuk, Olena Naumchak and Mykola Romanchuk</i> Fake News Detection in the Framework of Decision-Making System Through Graph Attention Network
5.	<i>Serhiy Kovbasiuk, Leonid Kanevskyy, Sergiy Chernyshuk, Leonid Naumchak and Mykola Romanchuk</i> Creation Method of Priori Neural Network Data Set for Processing Digital Aerial Photographs in Automatic Model

S3.3: Artificial Intelligence and Machine Learning

Wednesday, September 22

14:00 – 15:15

[Link to the online meeting](#)

Chair:
Dr. Victoria Vysotska

1.	<i>Dmytro Chumachenko, Kseniia Bazilevych, Ievgen Meniailov, Sergiy Yakovlev and Tetyana Chumachenko</i> Simulation of COVID-19 Dynamics using Ridge Regression
2.	<i>Wei Liu, Pan Li, Zhiwei Ye and Shuai Yang</i> A Node Deployment Optimization Method of WSN Based on Firefly Algorithm
3.	<i>Victor Krasnobayev, Alexandr Kuznetsov, Mykhaylo Bagmut and Tetiana Kuznetsova</i> Artificial Intelligence and Number System in Residual Classes
4.	<i>Dmytro Polokhach, Vasyl Kushnir and Oleksandr Vashchuk</i> Investigating a different approaches to resolve binary classification task with unbalanced dataset
5.	<i>Petro Kravets, Vasyl Lytvyn, Yevhen Burov, Victoria Vysotska, Lyubomyr Chyrun and Valentyna Panasyuk</i> Making Optimal Decisions with Learning Method Based on Fuzzy Logic

S3.4: Artificial Intelligence and Machine Learning

Wednesday, September 22

15:30 – 16:30

[Link to the online meeting](#)

Chair:
Dr. Taras Maksymyuk

1.	<i>Alexandr Trunov and Vitalii Koshovyi</i> The Formation of Method for Evaluation of Integral Parameters of the Patient's Condition Monitoring, Forecasting of Consolidated Data
2.	<i>Oleksandr Striuk and Yuriy Kondratenko</i> Adaptive Deep Convolutional GAN for Fingerprint Sample Synthesis
3.	<i>Anton Vovk, Andriy Fechan, Mikola Kushnirchuk, Oksana Boyko, Askold Kucher and Oleksiy Dutchak</i> Medical database and decision system for the analysis of the thyroid pathologies
4.	<i>Jian Wang, Shuhui Yi, Shaowen Xing, Hao Liu, Jian Liu, Genrong Wang, Chunzhi Wang</i> Short-term Load Forecasting Model for Smart Grid

Reserved Session: Miscellaneous

Wednesday, September 22

16:45 – 18:00

[Link to the online meeting](#)

Chair:
Dr. Yulia Pyrih

Reserved session will be available for the participants to present their papers, which have not been presented at the regular sessions due to the technical or connectivity issues.

KEYNOTE SPEECH

Thursday, September 23

10:00 – 10:45

[Link to the online meeting](#)

2.	<i>Prof. Madhusanka Liyanage, University College Dublin, University of Oulu</i> Blockchain-enabled Private 5G Networks (P5GNs)
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S4.1: Future Information and Communication Systems

Thursday, September 23

10:45 – 11:45

[Link to the online meeting](#)

Chair:

Prof. Oleksandra Yeremenko

1.	<i>Marek Ružička, Marcel Vološin, Juraj Gazda and Taras Maksymyuk</i> Correcting defective trajectories using conditional GAN
2.	<i>Mikola Patlaenko, Olena Osharovska and Valentina Solodka</i> Comparison of LTE Coverage Areas in Three Frequency Bands
3.	<i>Oleksandr Lemeshko, Oleksandra Yeremenko, Anastasiia Shapovalova, Maryna Yevdokymenko, Stephen Olayinka Omowumi and Ahmad M. Hailan</i> Secure Routing with Power Link Blocking Model and Load Balancing
4.	<i>Oleksandr Romanov, Nadiia Korniienko and Hrigorii Burlaka</i> Construction of the SDN Transport Network Model using the T-API interface

S4.2: Future Information and Communication Systems

Thursday, September 23

12:00 – 13:00

[Link to the online meeting](#)

Chair:
Dr. Mykola Beshley

1.	<i>Victor Krasnobayev, Alexandr Kuznetsov, Victoria Popenko and Tetiana Kuznetsova</i> Mathematical Model of the Reliability of a Computer System which is Functioning in the Residual Class System, Taking into Account the Reliability of Switching Devices
2.	<i>Igor Melnyk and Andriy Luntovskyy</i> Estimation of Level of Algorithms Parallelization and Efficiency of Using Different Error-Correction Codes in Cloud Realizations of Parallel Computing Algorithms
3.	<i>Mykhailo Medvetskyi, Mykola Beshley, Andrii Pryslupskyi and Halyna Beshley</i> Machine Learning-Enabled Software-Defined Networks for QoE Management
4.	<i>Mykola Beshley, Halyna Beshley, Ivan Demydov and Orest Kochan</i> Radio Resource Management Methods for Ultra-Reliable Low Latency Communications in 5G LTE Narrowband Industrial Internet of Things

S5.1: Cybersecurity and Blockchain

Thursday, September 23

14:00 – 15:15

[Link to the online meeting](#)

Chair:
Prof. Ivan Opirskyy

1.	<i>Volodymyr Strukov and Vladislav Gudilin</i> Experimental investigation of web application security
2.	<i>Dmytro Ageyev, Tamara Radivilova and Othman Mohammed</i> Traffic Monitoring and Abnormality Detection Methods for IoT
3.	<i>Alexandr Kuznetsov, Irina Lokotkova, Oleksii Smirnov, Tetiana Kuznetsova, Serhii Florov and Oksana Lebid</i> Using Orthogonal Signals to Hide Information in Images
4.	<i>Ivan Opirskyy, Ivan Tyshyk and Vitalii Susukailo</i> Evaluation of the possibility of realizing the crime of the information system at different stages of TCP/IP
5.	<i>Mykola Buchyn, Anna Helesh and Bohdan Shubyn</i> Information security during electronic voting: threats and mechanisms for ensuring

S5.2: Cybersecurity and Blockchain

Thursday, September 23

15:30 – 16:30

[Link to the online meeting](#)

Chair:

Dr. Roman Odarchenko

1.	<i>Maksim Iavich, Razvan Bocu, Giorgi Iashvili and Roman Odarchenko</i> A Post-Quantum Secure e-Health System for the Data Management
2.	<i>Vladimir Barannik, Sergii Shulgin, Serhii Holovchenko, Pavlo Hurzhiy, Sergy Sidchenko and Gennady Pris</i> Method of Hierarchical Protection of Biometric Information
3.	<i>Vladimir Barannik, Dmitry Barannik, Yevhenii Sidchenko, Oleksandr Ignatyev, Oleksandr Slobodyanyuk and Roman Lazuta</i> Method of Masking Information in the Contours of Video Images
4.	<i>Alexandr Kuznetsov, Serhii Datsenko, Yuriy Gorbenko, Tetiana Chupilko, Maxim Korneyev and Victoria Klym</i> Experimental Researches of Biometric Authentication Using Convolutional Neural Networks and Histograms of Oriented Graphs

Reserved Session: Miscellaneous

Thursday, September 23

16:45 – 18:00

[Link to the online meeting](#)

Chair:

Dr. Olha Shpur

Reserved session will be available for the participants to present their papers, which have not been presented at the regular sessions due to the technical or connectivity issues.

FINAL SESSION

Friday, September 24

10:00-11:00

[Link to the online meeting](#)

Chair:

Prof. Mykhailo Klymash

- 1. Concluding reports of Section Chairs**
- 2. Discussion**
- 3. Conference summary**

CONFERENCE CLOSING