2022 IEEE 4th International Conference on Advanced Trends in Information Theory (IEEE ATIT 2022)

https:// atit.ieee.org.ua

e-mail: atit@ieee.org.ua

CONFERENCE PROGRAM

15.12.22 - 17.12.22

Kyiv

Ukraine

ORGANIZERS

- **IEEE Ukraine Section.**
- **IEEE Ukraine Section Information Theory Society Chapter.**
- **State Service for Special Communication and Information Protection of Ukraine, Ukraine (HOST)**
- The National Defence University of Ukraine named after Ivan Cherniakhovskyi.
- Igor Sikorsky Kyiv Polytechnic Institute, Ukraine.
- National Aviation University of Kyiv, Ukraine.
- V. N. Karazin Kharkiv National University.
- Kharkiv National University of Radio Electronics, Ukraine.
- National Aerospace University «Kharkiv Aviation Institute», Kharkiv, Ukraine.
- Kamianets-Podilskyi National Ivan Ohiienko University

PARTNERS

- Saycom Company Kyiv, Ukraine.

ORGANIZING COMMITTEE

CHAIR

- **Prof. Oleksandr Yudin,** State Service for Special Communication and Information Protection of Ukraine, Ukraine.

IEEE Ukraine Section Information Theory Society Chapter.

TECHNICAL PROGRAM COMMITTEE CHAIR / TPC CHAIR

CO-CHAIRS

- **Prof. Volodymyr Barannik,** V. N. Karazin Kharkiv National University, Ukraine. Chair of IEEE Ukraine Section Information Theory Society Chapter.

TECHNICAL PROGRAM COMMITTEE

- **Prof. Volodymyr Samotyy,** Kracow University of Technology, Poland.
- **Prof. Vladimir Hahanov,** Kharkov National University of Radio Electronics, Ukraine
- **Prof. Oleksandr Rolik,** Igor Sikorsky Kyiv Polytechnic Institute, Ukraine.
- **Prof. Olha Suprun,** National Aviation University of Kyiv, Ukraine.
- **Prof. Sergii Telenyk,** Igor Sikorsky Kyiv Polytechnic Institute, Ukraine.
- **Prof. Oleg Fedorovich**, National Aerospace University «Kharkiv Aviation Institute», Kharkiv, Ukraine.
- **Prof. Vladimir Lukin**, National Aerospace University «Kharkiv Aviation Institute», Kharkiv, Ukraine.
- **Prof. Mykola Ponomarenko,** Senior Research Fellow Tampere University, Finland.
- **Prof. Serhiy Pogorily,** Taras Shevchenko National University of Kyiv, Ukraine.
- **Prof. Wojciech Guzewicz,** Uniwersytet Warminsko-Mazurski w Olsztynie, Poland.

CONFERENCE SECRETARY

- **Associate Prof. Victoria Ivannikova,** Business School, Dublin City University.

PUBLICATION CHAIRS

- **Prof. Olha Suprun,** National Aviation University of Kyiv, Ukraine.

PROGRAM COMMITTEE

- Prof. Piotr Gawliczek, Uniwersytet Warminsko-Mazurski w Olsztynie, Poland.
- Prof. Volodymyr Khoma, Opole University of Technology, Opole, Poland.
- Prof.Wojciech Welskop, Rector of The Academy of Business and Health Sciences, Poland.
- Prof. Anna Walulik, Academy of Ignatianum in Krakow, Poland.
- Prof. Aleksandr Kuznetsov, V.N. Karazin Kharkiv National University, Ukraine.
- Prof. Oleksandr Lemeshko, Kharkiv National University of Radio Electronics, Ukraine.
- Prof. Hanna Khakhanova , Kharkov National University of Radio Electronics, Ukraine
- Prof. Iryna Klymenko, Igor Sikorsky Kyiv Polytechnic Institute Ukraine.
- Prof. Eduard Zharikov,Igor Sikorsky Kyiv Polytechnic Institute Ukraine.
- Prof. Oleksandr Rolik, Igor Sikorsky Kyiv Polytechnic Institute, Ukraine.
- Prof. Bogdan Kornienko, Igor Sikorsky Kyiv Polytechnic Institute, Ukraine.
- Prof. Ihor Tereikovskyi, Igor Sikorsky Kyiv Polytechnic Institute, Ukraine.
- Prof. Natalia Korolyova, Ukrainian State University of Railway Transport Kharkiv, Ukraine
- Associate Prof. Elena Chebanyuk, National Aviation University of Kyiv, Ukraine.
- Prof. Svetlana Loboda, National Aviation University of Kyiv, Ukraine.
- Prof. Hennadii Khalimov, Kharkiv National University of Radio Electronics, Ukraine.
- Prof. Valeriy Lakhno, National University of Life and Environmental Sciences of Ukraine, Ukraine.
- Prof. Oleksandr Potii, JSC Institute of Information Technology, Kharkiv, Ukraine.
- Prof. Mykhailo Shelest, Chernihiv Polytechnik National University (CPNU), Chernihiv, Ukraine.
- Prof. Vagif Gasimov, Azerbaijan Technical University, Baku, Azerbaijan
- Prof. Bakhytzhan Akhmetov, Abai Kazakh National Pedagogical University, Almaty, Kazakhstan.
- Oleh Suprun, Taras Shevchenko National University of Kyiv, Ukraine.
- Olesya Afanasyeva, Pedagogical University in Technics Institute, Krakow, Poland.
- Dmytro Lande, Head of Department, Institute of Information Recording NAS of Ukraine, Kyiv, Ukraine.
- Serhii Yevseiev, Simon Kuznets Kharkiv National University of Economics, Kharkiv, Ukraine.
- Alla Kobozeva, Odessa national polytechnic university, Odessa, Ukraine.
- Ruslan Hryshchuk, Korolyov Zhytomyr Military Institute, Zhytomyr, Ukraine.
- Kateryna Molodetska, Zhytomyr National Agroecological University, Zhytomyr, Ukraine.
- Ivan Opirskyy, Lviv Polytechnic National University, Lviv, Ukraine.
- Oleksii Smirnov, Central Ukrainian National Technical University, Kropyvnytskyi, Ukraine.
- Prof. Olena Tolstoluzka, V. N. Karazin Kharkiv National University, Kharkiv, Ukraine
- Associate Prof. Oleg Kulitsa, National University of Civil Defence of Ukraine, Cherkasy, Ukraine.
- Oleksandr Slobodyanyuk, Kamianets-Podilskyi National Ivan Ohiienko University.

- Associate Prof. Andrii Krasnorutsky, Kharkov National University of Radio Electronics, Ukraine.
- Associate Prof. Serhii Sidchenko Ivan Kozhedub Kharkiv National Air Force University Kharkiv, Ukraine.
- Associate Prof. Hurzhii Pavlo Heroes of Kruty Military Institute of Telecommunication sand Informatization Kyiv, Ukraine.
- Associate Prof. Rostislav Motsyk Kamianets-Podilskyi National Ivan Ohiienko University Kamianets-Podilskyi, Ukraine.
- Associate Prof. Volodymyr Kryvonos, Ivan Kozhedub Kharkiv National Air Force University Kharkiv, Ukraine.

LOCAL TECHNICAL COMMITTEE

- Oleh Suprun**,** Technical secretary, Taras Shevchenko National University of Kyiv, Ukraine.

CONFERENCE SECTIONS

15th December 2022

12.45 - 13.00 \13.45 - 14.00 – **Registration**
(On-line session in Zoom:
https://us02web.zoom.us/j/89928686396?pwd=R2ZmSFZUWjJSZVk5bVJ4MkRsWHgwQT09
Conference ID: 899 2868 6396
Access code: 283939)

13.00-15.00\14.00-16.00 – **Opening of conference. Plenary reports**
(On-line session in Zoom:
https://us02web.zoom.us/j/89928686396?pwd=R2ZmSFZUWjJSZVk5bVJ4MkRsWHgwQT09
Conference ID: 899 2868 6396
Access code: 283939)

Moderators:
Prof. Oleksandr Yudin, State Service for Special Communication and Information Protection of Ukraine, Ukraine
Associate Prof. Victoria Ivannikova, Business School, Dublin City University.

Technical secretary
Oleh Suprun, Taras Shevchenko National University of Kyiv, Ukraine.

13:00 - 13:20	The role of IEEE in Ukraine. IEEE Ukraine Section	Prof. Felix Yanovsky, CHAIR IEEE Ukraine Section. National Aviation University of Kyiv, Ukraine
13:20 - 13:40	Research focus of the IEEE Ukraine Section of Information Theory Society Chapter	CHAIR IEEE ATIT, National Academy of the Security Service of Ukraine, Ukraine

	Method Of Coding Subbands Of Non-Homogeneous Spectrum Of Video Segments In Uneven Diagonal Space **(60)** ***Sergii Shulgin*** ***Kharkov National University of Radio Electronics, Kharkiv, Ukraine***	Volodymyr Barannik V. N. Karazin Kharkiv National University Kharkiv, Ukraine Sergii Shulgin Kharkov National University of Radio Electronics, Kharkiv, Ukraine
	Hash-Function Algorithms Balanced On Reliability And Data Processing Speed **(69) George Prokhorov** ***Chernivtsi National University***	George Prokhorov; Yuriy Dobrovolsky; Rostyslav Diachuk

Track 1

14.00 -18.00 – **Track 1**
(On-line session in Zoom:
https://us02web.zoom.us/j/81847197197?pwd=ZzlWVE05c3lvZStNQ1FRRDNUcTQ0QT09
Conference ID: 818 4719 7197
Access code: 725931*).*

Moderators:

- Associate Prof. Rostislav Motsyk Kamianets-Podilskyi National Ivan Ohiienko University

Technical secretary:
Anatolii Berchanov, V. N. Karazin Kharkiv National University, Ukraine.
Oleh Suprun, Taras Shevchenko National University of Kyiv, *Ukraine.*

Track 1 Title **Source Coding and Data Compression**	**Author**	**Number of accepted papers**
Matched Filter For Extended Images Of Astronomical Objects In CCD-Frames From Streams Доповідач Vadym Savanevych ***(Kharkiv National University of Radio Electronics)***	Vadym Savanevych; Vladimir Vlasenko; Sergii V Khlamov; Olexander Briukhovetskyi; Eugen Dikov	***1***
Signal Processing In The Synchronization System Of Communication Channel With OFDM Juliy Boiko ***(Khmelnytsky National University)***	Juliy Boiko; Ilya Pyatin; Oleksander Eromenko	***4***
The Method Of Decoding Signals Of Temperature Sensors Of Communication Network Equipment Based On The Use Of Nonlinear Volterra Integral Models Доповідач Vadym Ponedilok ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Volodymyr Fedorchuk; Vitalii Ivaniuk; Vadym Ponedilok	***44***

The Methods Of Joint Signal Discrimination And Parameters Estimation In Non-Gaussian Noise Доповідач Volodymyr Palahin ***(Cherkasy State Technological University)***	Daniil Smirnov; Valentyn Chepynoha; Oleksandr Zorin; Artem Honcharov; Elena Palahina; Volodymyr Palahin	***49***
Research Of Prospective Encoding Methods For Multimedia Content Protection Доповідач Tetiana Pylypiuk ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Tetiana Pylypiuk; Olena Smalko; Oleksiy Koval	***50***
Method Of Structural-Statistical Coding Of Video Segments In Spectral-Cluster Space Доповідач Anatolii Berchanov ***V. N. Karazin Kharkiv National University***	Andrii Krasnorutsky; Volodymyr Barannik; Vitalii Kolesnyk; Nataliia Kharchenko; Anatolii Berchanov; Oleksander Malko	***52***
Approach To Coding With Improved Integrity Of Video Information For Transmission In Wireless Infocommunication Networks Доповідач Valerii Tkachuk ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Oleksandr Slobodyanyuk Roman Onyshchenko; Andrii Krasnorutsky; Vitalii Kolesnyk; Valerii.Bezruk; Sergey Podlesny	***53***
Platform Adaptive Integer Ac Technology Combination Доповідач Kyrylo Revva ***(Kharkiv National University of Radio Electronics)***	Oleksandr Yudin Havrylov Dmytro Roman Onyshchenko Kyrylo Revva Ivan Pantas Oleksii Mukoviz	***54***
Technology Of Coding Video Images In Structure-Cluster Space To Increase Efficiency And Reliability Доповідач Valerii Tkachuk ***V. N. Karazin Kharkiv National University*** ***Ivan Kozhedub Kharkiv National Air Force University***	Vladimir Barannik; Andrii Krasnorutsky ; Roman Onyshchenko; Vitalii Kolesnyk	***55***

The Methods Of Intellectual Processing Of Video Frames In Coding Systems In Progress Aeromonitor To Increase Efficiency And Semantic Integrity Доповідач Denis Narolskyi ***V. N. Karazin Kharkiv National University*** ***Ivan Kozhedub Kharkiv National Air Force University*** ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Andrii Krasnorutsky; Roman Onyshchenko; Vladimir Barannik;	***56***
Methodology For Assessing The Security Of Encoded Video Information Resources Of Video Conferencing In Public Administration Доповідач Oleksandra Voitsekhivska ***(Kharkiv National University of Radio Electronics)*** ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Natalia Korolyova; Andrii Vlasov; Oleksandra Voitsekhivska; Hurzhii Pavlo; Mykhailo Babenko	***57***
Technology Of Coding Video Resource To Increase Their Integrity And Availability Доповідач Yurii Babenko ***Taras Shevchenko National University of Kyiv***	Serhii Buchyk; Serhii Pantas; Yurii Babenko; Volodymyr Manakov; Andrii Yermachenkov; Roman Onyshchenko	***58***
Method Taking Into Account Level Of Structural And Statistical Saturation Of Video Segments In The Coding Process Доповідач Yurii Babenko ***Taras Shevchenko National University of Kyiv***	Vladimir Barannik; Yurii Babenko; Vitalii Kolesnyk; Dmytro Zhuikov	***59***
Method Of Coding Subbands Of Non-Homogeneous Spectrum Of Video Segments In Uneven Diagonal Space **пленарне**		***60***
Dynamic Coding Method Of Video Segments Stream By Specifying Structural Changes Доповідач Sergii Shulgin ***(Kharkiv National University of Radio Electronics)***	Sergii Shulgin; Natalia Barannik	***61***

Processing Technology Of A Flow Of The Differential Provided Frames In Objective Video Inspection Infocommunication Systems Доповідач Oleh Kulitsa ------ Oleksandra Voitsekhivska ***National University of Civil Defence of Ukraine, Cherkasy*** ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Albert Lekakh; Oleg Kulitsa; Oleksandr Iakovenko; Victor Shchyrba; Vita Melnychuk; Gennady Pris	***62***
Quadrature Compression Technology In Two-Level Polyadic Space For Infocommunication Systems Доповідач Sergii Shulgin ***(Kharkiv National University of Radio Electronics)***	Volodymyr Barannik; Sergii Shulgin; Dmitry Barannik; Yevhenii Sidchenko	***63***
Steganographic Coding Technology For Hiding Information In Infocommunication Systems Of Critical Infrastructure Доповідач Dmitry Barannik ***(Kharkiv National University of Radio Electronics)***	Dmitry Barannik;	***64*** ***poster***
Mathematical Model Of The Process Encoding And Transmitting Video In Face Of Cyberattacks Доповідач Valerii Tkachuk ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Sergey Podlesny; Rostislav Motsyk; Oleksandr Matviichuk-Yudin; Nataliia Bakhmat; Leonid Kolodiichuk Valerii Tkachuk	***65***
Technology Of Structural-Binomial Coding To Increase The Efficiency Of The Functioning Of Computer Systems ***poster***		***66*** ***poster***

The Concept Of Creating A Complex Cryptocompression Image Protection System In Infocommunications Доповідач Denis Narolskyi ***V. N. Karazin Kharkiv National University*** ***Ivan Kozhedub Kharkiv National Air Force University*** ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Volodymyr Barannik; Serhii Sidchenko; Dmitry Barannik; Oleksandr Ignatyev	***67***
The Method Drawing Up The Text With The Set Suggestive Orientation To Create A Hidden Channel ***poster***		***68*** ***poster***
Hash-Function Algorithms Balanced On Reliability And Data Processing Speed **пленарне**		***69***
Video Stream Intensity Control Technology Based On The Selection Of Compression Process Parameters And Block Encoding Доповідач Oleh Kulitsa ------ Denis Narolskyi ***National University of Civil Defence of Ukraine, Cherkasy*** ***(Kamianets-Podilskyi Ivan Ohiienko National University)***	Oleh Kulitsa; Vitaliy Tverdokhlib; Oleksandr Matviichuk-Yudin; Vita Romaniuk; Olena Matviichuk-Yudina; Denis Narolskyi	***72***

24	
29	
0.82	

16th November 2022

Track 2

10.00 - 18.00 – **Track 2**
(On-line session in Zoom:
https://us02web.zoom.us/j/84750537769?pwd=SEdXcXpvdlI0WlFKNm4xM1cvalVvZz09）.

Moderators:
Prof. Yurii V. Kravchenko, Taras Shevchenko National University of Kyiv. Ukraine.
Prof. Sergiy D. Pogorilyy, Taras Shevchenko National University of Kyiv, Ukraine.

Secretary:
Artem Kramov, Taras Shevchenko National University of Kyiv, Ukraine.
Pavlo Biletskyi, Taras Shevchenko National University of Kyiv, Ukraine.

17th November 2022

Track 3

10.00 - 18.00 – **Track 3**
(On-line session in Zoom:
https://us02web.zoom.us/j/81847197197?pwd=ZzlWVE05c3lvZStNQ1FRRDNUcTQ0QT09
Conference ID: 818 4719 7197
Access code: 725931*).*

Moderators:

- Prof. Oleksandr Yudin, State Service for Special Communication and Information Protection of Ukraine.

Technical secretary:
Oleh Suprun, Taras Shevchenko National University of Kyiv, *Ukraine.*