



# INFORMATION TECHNOLOGIES: THEORETICAL AND APPLIED PROBLEMS (ITTAP-2022)

**November 22-24, 2022**  
**Ternopil, UKRAINE**

The 2nd International Workshop

<https://ittap.tntu.edu.ua/>

## CONFERENCE PROGRAMME



Ternopil Ivan Puluj National  
Technical University  
**Member Of European  
University Association**

Journal of  
Sustainable  
Development of  
Transport and  
Logistics

\* Scientific Platform - SciView.net \*

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Scientific and Educational IT Society

**22-24, November, 2022, Ternopil, UKRAINE**

# ITTAP 2022 General Timetable

<b>November 22</b>		
	<b>9:50-10:00 (10)</b>	<b>Conference opening</b>
1	10:00-10:10	<b>Vasyl Yatsyshyn, Oleh Pastukh, Andriy Lutskiv, Viktor Tsymbalistyy and Nataliia Martsenko.</b> A Risks management method based on the quality requirements communication method in agile approaches
2	10:10-10:20	<b>Serhii Lupenko, Oleksandra Orobchuk and Igor Kateryniuk.</b> Formalization of Chinese Image Medicine Diagnostic Space in Ontooriented Information Systems for Integrative Scientific Medicine
3	10:20-10:30	<b>Nataliia Zagorodna, Yuriy Skorenkyy, Nataliia Kunanets, Ihor Baran and Maria Stadnyk.</b> AR-Enhanced Learning Tools Development for Cybersecurity Major
4	10:30-10:40	<b>Boryslav Selskyi, Sviatoslav Kostiv, Ihor Venher and Petro Selskyi.</b> Predicting the risk of surgical complications based on multiparametric neural network clustering at revascularization of main arteries of the lower limbs
5	10:40-10:50	<b>Mohammadsadeh Mohagheghi.</b> Memory Efficient Strategy Approximation for Large Markov Decision Processes
6	10:50-11:00	<b>Mykhaylo Petryk, Mykhaylo Bachynskyy, Vitaly Brevus, Ivan Mudryk and Dmytro Mykhalyk.</b> Analysis technology of neurological movements considering cognitive feedback influences of cerebral cortex signals
7	11:00-11:10	<b>Sergii Rozenko, Sergii Litvintsev and Ludmila Pinchuk.</b> Transmission Line Resonators for Filters with Wide Stopband
8	11:10-11:20	<b>Oleh Pihnastyi, Olha Kozhyna and Tetiana Kulik.</b> Linear Regression Approximate Models for Predicting Severe Course of Bronchial Asthma
9	11:20-11:30	<b>Oleksii Bychkov, Kateryna Merkulova and Yelyzaveta Zhabska.</b> Preprocessing Methods Study to Improve Information Technology for Person Identification by Occluded Image
	<b>11:30-12:00 (30)</b>	<b>Coffee break</b>
10	12:00-12:10	<b>Mykhailo Fryz and Bogdana Mlynko.</b> Property Analysis of Conditional Linear Random Process as a Mathematical Model of Cyclostationary Signal
11	12:10-12:20	<b>Serhii Hilgurt.</b> Pattern Handling for Quantifying Hardware Components of Signature-Based Cybersecurity Systems
12	12:20-12:30	<b>Eugene Fedorov and Olga Nechyporenko.</b> Methods for Solving the Traveling Salesman Problem Based on Reinforcement Learning and Metaheuristics
13	12:30-12:40	<b>Vitalii Mykhalchuk.</b> Cognitive design of educational brain-computer interfaces
14	12:40-12:50	<b>Sofiia Vasylyuk, Oleksa Shved, Zoriana Hubrii, Olena Vichko and Olha Shved.</b> Biosafety and Biosafety of Health and the Environment on the Basis of Information Technologies Column
15	12:50-13:00	<b>Vasyl Trysnyuk, Volodymyr Yehorov, Serhii Tymchuk and Taras Trysnyuk.</b> Geo-information system for ensuring the functioning of the VHF range radio direction finding network
16	13:00-13:10	<b>Oleksandra Kuchvara, Zoryana Mayhruk and Vasyl Martsenyuk.</b> Software implementation of the multivariate method for the Hodgkin-Huxley model.
17	13:10-13:20	<b>Vasyl Martsenyuk, Andriy Sverstiuk, Oksana Bahrii-Zaiats and Aleksandra Klos-Witkowska.</b> Qualitative and Quantitative Comparative Analysis of Results of Numerical Simulation of Cyber-Physical Biosensor Systems on the Basis of Lattice Differential Equations

18	13:20-13:30	<b>Leonid Scherbak, Iaroslav Lytvynenko, Serhii Kharchenko, Oleg Nazarevych and Volodymyr Hotovykh.</b> Mathematical model of the energy resource consumption process in the form of a random process with piecewise homogeneous components
19	13:30-13:40	<b>Oksana Sitkar, Bogdan Kovalyuk and Vitalii Mocharskyi.</b> Mathematical modeling of the nanotubes implementation into a solid-state matrix using a powerful laser
20	13:40-13:50	<b>Leonid Galchynsky, Vladyslav Khaidurov, Tamara Tsiupii and Tetiana Zhovnovach.</b> Mathematical Models and Software for Modelling the Spread of Malware in Energy Facilities

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<b>11:30-12:00 (30)</b>		<b>Coffee break</b>
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11	12:10-12:20	<b>Rustam Gamzayev, Tilmann Reuther, Mykola Tkachuk and Vitalii Filatov.</b> Design and Implementation of Advanced Web-based Dictionary System for Ukrainian and German Languages
12	12:20-12:30	<b>Oleg Dekusha, Svitlana Kovtun, Vladyslav Romanenko and Stanislav Sozonov.</b> Information-measuring Technology for Buildings Enclosing Structures Thermal Resistance Control

13	12:30-12:40	<b>Liliya Khvostivska, Mykola Khvostivskyy, Vasyl Dunetc and Iryna Dediv.</b> Mathematical and Algorithmic Support of Detection Useful Radiosignals in Telecommunication Networks
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16	13:00-13:10	<b>Simona Kirešová, Milan Guzan and Volodymyr Rusyn.</b> Particulate Matter PM2.5 and PM10 and Its Impact on Air Quality in Urban and Rural Areas
17	13:10-13:20	<b>Tetiana Hovorushchenko, Peter Popov, Dmytro Medzaty and Yurii Voichur.</b> Method and Technology for Ensuring the Software Security by Identifying and Classifying the Failures and Vulnerabilities
18	13:20-13:30	<b>Vitalii Babak, Artur Zaporozhets, Yurii Kuts, Mykhailo Myslovych, Mykhailo Fryz and Leonid Scherbak.</b> Models and Characteristics of Identification of Noise Stochastic Signals of Research Objects
19	13:30-13:40	<b>Andrii Savitskyi, Iryna Kramar, Viktor Nyzhnyk, Ecaterina Daniela Zeca and Nataliia Marynenko.</b> The multifactor regression model for export-oriented sustainable management of enterprise profitability

<b>November 24</b>		
1	10:00-10:10	<b>Oleksiy Yanenko, Kostiantyn Shevchenko, Sergiy Peregudov, Vladyslav Malanchuk, Volodymyr Shvydchenko and Oleksandra Golovchanska.</b> Method for Determining the Electromagnetic Compatibility of Biomaterials
2	10:10-10:20	<b>Nadiia Marchenko, Hanna Martyniuk, Olena Monchenko, Larysa Chubko and Tetiana Scherbak.</b> Information software of multi-level systems of monitoring and diagnostics of complex technical objects
3	10:20-10:30	<b>Vasil Dozorskyi, Oksana Dozorska, Evhenia Yavorska, Leonid Dediv and Andrii Kubashok.</b> The Method of Detection of Speech Process Signs in the Structure of Electroencephalographic Signals
4	10:30-10:40	<b>Andrii Rudyk, Andriy Semenov, Olena Semenova, Serhii Tsyruynyk and Volodymyr Tromsyuk.</b> Model Study of the Q-factor of a Varicap Diode by Its Equivalent Circuits
5	10:40-10:50	<b>Ihor Bodnarchuk, Yuriy Skorenkyy, Taras Kramar, Oleksii Duda and Vyacheslav Nykytyuk.</b> Use of Analytical Hierarchy Process in Scenarios Design for a Digital Museum with XR components
6	10:50-11:00	<b>Oleh Shkodzinsky, Mykhailo Lutskiv and Marian Smoliy.</b> Selection of Face Detection and Recognition Algorithms for the E-learning System
7	11:00-11.10	<b>Vasyl Kuz, Oleksiy Yanenko, Kostiantyn Shevchenko and Roman Tkachuk.</b> Automated Energy-efficient System for Cleaning and Disinfection of Reusable Objects
8	11:10-11:20	<b>Oksana Petryk, Igor Boyko, Yurii Stoianov, Stepan Balaban and Julia Nestor.</b> Mathematical modeling of diffusion transfer for charged particles in the layered composite medium
9	11:20-11:30	<b>Vitalii Mocharskyi, Bogdan Kovalyuk and Oksana Sitkar.</b> Modelling the Distribution of Laser Energy in the Pulse by the Photoemulsion Method

10	11:30-11:40	<b>Vladyslav Khaidurov, Tamara Tsiupii, Tetiana Zhovnovach, Artur Zaporozhets, Olena Kharchenko and Serhii Kharchenko.</b> Computational Methods of Integration of Deterministic Systems, which are Described by Systems of Ordinary Differential Equations
11	11:40-11:50	<b>Serhii Tsyulnyk, Maksym Tsyulnyk, Nadiia Potapova, Andriy Semenov and Volodymyr Tromsyuk.</b> The climate control system using ESP8266 and Arduino IoT Cloud
12	11:50-12:00	<b>Oksana Tur, Viktoriia Shabunina and Anastasiia Tur.</b> Modern Medical Information Technologies: Implementation Issues and Development Vectors
	<b>12:00-12:15</b>	<b>Final session</b>

### TIME FOR PRESENTATIONS

Paper presentation at the regular session – 5 min.

Discussion, questions – 5 min.



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## November 22

Link Conference: <https://tube5.tntu.edu.ua/b/e4t-9bf-di5-tcc>

YouTube: <https://www.youtube.com/channel/UCn3iBiVcrCCDooKSJTD2pww>

### Conference opening

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7	11:00-11.10	<b>Mykola Stashkiv, Viktor Stashkiv and Iaroslav Lytvynenko.</b> Test Data Processing Use for Structural Fatigue Life Assessment	<a href="https://youtu.be/GXIXi7erS50">https://youtu.be/GXIXi7erS50</a>
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		of Humus Balance in Soils of Ukraine Using Informational Tools	
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16	13:00-13:10	<b>Simona Kirešová, Milan Guzan and Volodymyr Rusyn.</b> Particulate Matter PM <sub>2.5</sub> and PM <sub>10</sub> and Its Impact on Air Quality in Urban and Rural Areas	<a href="https://youtu.be/j3EcrRFAm8U">https://youtu.be/j3EcrRFAm8U</a>
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		<b>Voichur.</b> Method and Technology for Ensuring the Software Security by Identifying and Classifying the Failures and Vulnerabilities	
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1	10:00-10:10	<b>Oleksiy Yanenko, Kostiantyn Shevchenko, Sergiy Peregudov, Vladyslav Malanchuk, Volodymyr Shvydchenko and Oleksandra Golovchanska.</b> Method for Determining the Electromagnetic Compatibility of Biomaterials	<a href="https://youtu.be/Tsknfobg-i4">https://youtu.be/Tsknfobg-i4</a>
2	10:10-10:20	<b>Nadiia Marchenko, Hanna Martyniuk, Olena Monchenko, Larysa Chubko and Tetiana Scherbak.</b> Information software of multi-level systems of monitoring and diagnostics of complex technical objects	<a href="https://youtu.be/JpHTRoOjdHI">https://youtu.be/JpHTRoOjdHI</a>
3	10:20-10:30	<b>Vasil Dozorskyi, Oksana Dozorska, Evhenia Yavorska, Leonid Dediw and Andrii Kubashok.</b> The Method of Detection of Speech Process Signs in the Structure of Electroencephalographic Signals	<a href="https://youtu.be/8ZA1czx6Olw">https://youtu.be/8ZA1czx6Olw</a>
4	10:30-10:40	<b>Andrii Rudyk, Andriy Semenov, Olena Semenova, Serhii Tsyrlunyk and Volodymyr Tromsyuk.</b> Model Study of the Q-factor of a Varicap Diode by Its Equivalent Circuits	<a href="https://youtu.be/77A7-5f07J8">https://youtu.be/77A7-5f07J8</a>
5	10:40-10:50	<b>Ihor Bodnarchuk, Yuriy Skorenkyy, Taras Kramar, Oleksii Duda and Vyacheslav Nykytyuk.</b> Use of Analytical Hierarchy Process in Scenarios Design for a Digital Museum with XR components	<a href="https://youtu.be/jM1P6nIYbFY">https://youtu.be/jM1P6nIYbFY</a>
6	10:50-11:00	<b>Oleh Shkodzinsky, Mykhailo Lutskiv and Marian Smoliy.</b> Selection of Face Detection and Recognition Algorithms for the E-learning System	<a href="https://youtu.be/V191_q_1lnE">https://youtu.be/V191_q_1lnE</a>
7	11:00-11.10	<b>Vasyl Kuz, Oleksiy Yanenko, Kostiantyn Shevchenko and Roman Tkachuk.</b> Automated Energy-efficient System for	<a href="https://youtu.be/eKDNjp8XoFM">https://youtu.be/eKDNjp8XoFM</a>

		Cleaning and Disinfection of Reusable Objects	
8	11:10-11:20	<b>Oksana Petryk, Igor Boyko, Yurii Stoianov, Stepan Balaban and Julia Nestor.</b> Mathematical modeling of diffusion transfer for charged particles in the layered composite medium	
9	11:20-11:30	<b>Vitalii Mocharskyi, Bogdan Kovalyuk and Oksana Sitkar.</b> Modelling the Distribution of Laser Energy in the Pulse by the Photoemulsion Method	<a href="https://youtu.be/z9dHIDWbi2E">https://youtu.be/z9dHIDWbi2E</a>
10	11:30-11:40	<b>Vladyslav Khaidurov, Tamara Tsiupii, Tetiana Zhovnovach, Artur Zaporozhets, Olena Kharchenko and Serhii Kharchenko.</b> Computational Methods of Integration of Deterministic Systems, which are Described by Systems of Ordinary Differential Equations	<a href="https://youtu.be/LAJC-QuSuR4">https://youtu.be/LAJC-QuSuR4</a>
11	11:40-11:50	<b>Serhii Tsyrlunyk, Maksym Tsyrlunyk, Nadiia Potapova, Andriy Semenov and Volodymyr Tromsyuk.</b> The climate control system using ESP8266 and Arduino IoT Cloud	<a href="https://youtu.be/25zY_6O1UEU">https://youtu.be/25zY_6O1UEU</a>
12	11:50-12:00	<b>Oksana Tur, Viktoriia Shabunina and Anastasiia Tur.</b> Modern Medical Information Technologies: Implementation Issues and Development Vectors	<a href="https://youtu.be/-DyADXyflbc">https://youtu.be/-DyADXyflbc</a>
	12:00-12:15	<b>Final session</b>	

1. Conference summary. Discussion of the presented papers.
2. Meeting of the participants, Program and Organizing Committees. Feedbacks on the conference. Discussion on the possible ways of improvement for future.



Organized by:

Ternopil Ivan Puluj National Technical University,  
Faculty of Computer Information Systems and Software Engineering

**22-24, November, 2022, Ternopil, UKRAINE**