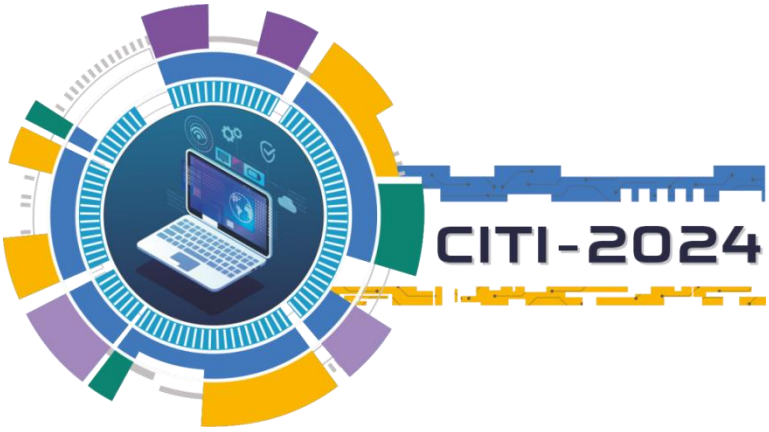

COMPUTER INFORMATION TECHNOLOGIES IN INDUSTRY 4.0

(CITI-2024)

2nd International Workshop

June 12-14, 2024
Ternopil, Ukraine
https://citi.tntu.edu.ua/

WORKSHOP PROGRAMME

Organizers

Ternopil Ivan Puluj National Technical University
Member Of European University Association

Partners and Sponsors

FAAI - 2022-1-PL01-KA220-HED-000088359

Co-funded by the European Union

University of Bielsko-Biala, Poland

CEUR Workshop Proceedings
ceur-ws.org
ISSN 1613-0073

CEUR-WS.org

The workshop will be held in the Zoom environment according to the schedule of participants' performances shown below

Join a Zoom meeting

https://us02web.zoom.us/j/3734325240?pwd=UENyUlE3bnBsdHFHanFHY1FrbnZlUT09

Meeting ID: 373 432 5240

Passcode: 654321

Attention!

During the workshop, changes are possible in accordance with the situation in Ukraine. In particular, in the case of air alarms, there will be breaks and continuation of the workshop will be after the air alarms are over

CITI-2024 General Timetable

June 12		
	9:45-10:10	**Registration of workshop participants**
	10:10	**Workshop opening**
	10:10-10:15	**Welcome speech of the workshop organizers**
	10:15-10:20	**Welcome speech of the program committee chair**
1	10:20-10:30	*Oleh Palka, Lesia Dmytrotsa, Oleksii Duda, Nataliia Kunanets and Volodymyr Pasichnyk* **Information and technological tools for analysis and visualization of open data in smart cities**
2	10:30-10:40	*Petro Stukhliak, Vasyl Martsenyuk, Oleg Totosko, Danulo Stukhlyak and Iryna Didych* **The use of neural networks for modeling the thermophysical characteristics of epoxy composites treated with electric spark water hammer**
3	10:40-10:50	*Andrii Sverstiuk, Mykola Stashkiv, Andrii Remez, Mykola Poshyvak and Volodymyr Machohan* **Estimation of accuracy, stiffness and stability of shell structures of mirror antennas using computer simulation**
4	10:50-11:00	*Victoria Vysotska, Vasyl Lytvyn, Serhii Vladov, Ruslan Yakovliev and Yevhen Volkanin* **Neural Network Method for Identifying Potential Defects in Complex Dynamic Objects**
5	11:00-11:10	*Andrii Voloshchuk, Diana Velychko, Halyna Osukhivska and Andriy Palamar* **Computer system for energy distribution in conditions of electricity shortage using artificial intelligence**
6	11:10-11:20	*Volodymyr Kuharsky, Dmytro Mykhalyk and Yuri Humen* **Analyzing specifics of scalability laws for proper modeling of a system's throughput**
7	11:20-11:30	*Yurii Palianytsia, Iaroslav Lytvynenko, Abdellah Menou, Grigorii Shymchuk and Andrii Dubchak* **Development of an algorithm for identification of damage types on the surface of sheet metal**
8	11:30-11:40	*Yurii Klots, Nataliia Petliak, Serhii Martsenko, Vitaliy Tymoshchuk and Ievgen Bondarenko* **Machine Learning system for detecting malicious traffic generated by IoT devices**
9	11:40-11:50	*Ivan Osiichuk, Vitaly Brevus, Dmytro Bishchak, Yaroslav Mashtaliar and Ivan Mudryk* **Leveraging graphics tablet and JPen library to detect essential tremor**

10	11:50-12:00	*Ihor Javorskyj, Roman Yuzefovych, Oleh Lychak, Pavlo Semenov and Roman Slyepko* **Demodulation of the simulated periodically non-stationary random signal with Hilbert transform**
	12:00-12:30	**Coffee brakes**
11	12:30-12:40	*Ivan Stefanyshyn, Oleh Pastukh, Volodymyr Stefanyshyn, Ihor Baran and Igor Boyko* **Robustness of AI algorithms for neurocomputer interfaces based on software and hardware technologies**
12	12:40-12:50	*Lyubomyr Mosiy, Halyna Kozbur, Iryna Strutynska, Olha Mosiy and Vasyl Yatsyshyn* **Information technology to support the digital transformation of small and medium-sized businesses**
13	12:50-13:00	*Ostap Stets, Ihor Konovalenko, Tomasz Gancarczyk and Artur Mykytyshyn* **Face anti-spoofing systems optimal threshold selection criteria**
14	13:00-13:10	*Mykhailo Rokosh, Mykola Pryimak and Nataliia Stadnyk* **Generative AI and Its Impact on Labor Productivity and the Global Economy**
15	13:10-13:20	*Qiong He, Caixiao Ouyang, Chunzhi Wang and Lingyu Yan* **Critical Flow Rerouting Based on Policy Gradient algorithm**
16	13:20-13:30	*Yanlie Zheng, Xueying Li and Qingxia Shen* **Course contrastive recommendation algorithm based on hypergraph convolution**
June 13		
	10:45-11:00	**Registration of workshop participants**
1	11:00-11:10	*Dmytro Dmytriv, Oleksii Duda, Pavlo Dudkin, Andrii Kryskov and Olga Perenchuk* **Industry 4.0 technologies for smart households**
2	11:10-11:20	*Liliia Khvostivska, Mykola Khvostivskyi and Iryna Dediv* **Mathematical, algorithmic and software support for signals wavelet detection in electronic communications**
3	11:20-11:30	*Oles Hospodarskyy, Vasyl Martsenyuk, Nataliia Kukharska, Andriy Hospodarskyy and Sofiia Sverstiuk* **Understanding the Adam Optimization Algorithm in Machine Learning**
4	11:30-11:40	*Pavlo Tymkiv, Aleksandra Kłos-Witkowska, Zhanna Babiak, Viktor Koshelyuk and Andriy Holovko* **Robotic Arm Concept for Surgery: Integrating of 3D Printing and IoT Technologies**

5	11:40-11-50	*Mykhaylo Strembitskyi, Mykhaylo Palamar, Vitalii Batiuk, Andrii Chaikovskyi and Iryna Plavutska* **Information System for Detecting Low-Flying Air Targets and Predicting Support Trajectory**
6	11:50-12:00	*Leonid Romaniuk, Marcin Bernas, Vitalii Kartashov, Ihor Chykhira and Halyna Tulaidan* **Aircraft automation principles as a basis for the use of information technologies**
	12:00-12:30	**Coffee brakes**
7	12:30-12:40	*Halyna Nahorniak, Andriy Sverstiuk, Liudmyla Maliuta, Viktor Khomyshyn and Katerina Hannouf* **Structure and Regularities of Development Information and Intellectual Capital Taking Into Account Acceleration of Digital Transformations in Conditions Information Society**
8	12:40-12:50	*Mykhaylo Petryk, Vitaly Brevus, Mykhaylo Bachynskyi, Andre Pierre Legrand and Mykola Zaiarnyi* **Multi-sensor analysis of cognitive signals for neurological disorders and diseases**
9	12:50-13:00	*Bohdan Orobchuk, Oleh Buniak, Ivan Sysak, Serhii Babiuk, Ihor Bodnarchuk and Vadym Koval* **Development of Software for the Implementation of Automated Reserve Input Modes Operation**
10	13:00-13:10	*Andrii Stanko, Wojciech Wieczorek, Andrii Mykytyshyn, Oleksandr Holotenko and Taras Lechachenko* **Real-time air quality management: Integrating IoT and Fog computing for effective urban monitoring**
11	13:10-13:20	*Yuriy Skorenkyy, Viktor Voroshchuk, Tetiana Vitenko and Oleksandr Kramar* **Development of digital twin interface for Industry 4.0 production line**
12	13:20-13:30	*Zhihua Yu, Can Zhou and Wenbin Xiao* **Optimal Control Scheme for Signalized Intersection Based on Phase Stream Combination in Autonomous Driving Environment**
13	13:30-13:40	*Yan Zhou, Jie Zhong, Xin Fang, Juan Huang and Lingyu Yan* **A study on rapid identification of medical vector organisms based on improved Transformer**
June 14		
	10:45-11:00	**Final session**

TIME FOR PRESENTATIONS

Paper presentation at the regular session – 5 min.

Discussion, questions – 5 min.

June 12

YouTube: https://youtu.be/VwJrtb7yhJs

	9:45-10:10	**Registration of workshop participants**
	10:10	**Workshop opening**
	10:10-10:15	**Welcome speech of the workshop organizers**
	10:15-10:20	**Welcome speech of the program committee chair**

Time		Report	YouTube link
1	10:20-10:30	*Oleh Palka, Lesia Dmytrotsa, Oleksii Duda, Nataliia Kunanets and Volodymyr Pasichnyk* **Information and technological tools for analysis and visualization of open data in smart cities**	**https://youtu.be/j2yrOEsFyqs**
2	10:30-10:40	*Petro Stukhliak, Vasyl Martsenyuk, Oleg Totosko, Danulo Stukhlyak and Iryna Didych* **The use of neural networks for modeling the thermophysical characteristics of epoxy composites treated with electric spark water hammer**	**https://youtu.be/AyzXlfy7hTA**
3	10:40-10:50	*Andrii Sverstiuk, Mykola Stashkiv, Andrii Remez, Mykola Poshyvak and Volodymyr Machohan* **Estimation of accuracy, stiffness and stability of shell structures of mirror antennas using computer simulation**	**https://youtu.be/FwwrXDYpZ7k**
4	10:50-11:00	*Victoria Vysotska, Vasyl Lytvyn, Serhii Vladov, Ruslan Yakovliev and Yevhen Volkanin* **Neural Network Method for Identifying Potential Defects in Complex Dynamic Objects**	**https://youtu.be/i-jMXODFbns**
5	11:00-11:10	*Andrii Voloshchuk, Diana Velychko, Halyna Osukhivska and Andriy Palamar* **Computer system for energy distribution in conditions of electricity shortage using artificial intelligence**	**https://youtu.be/faiuHN45ajM**
6	11:10-11:20	*Volodymyr Kuharsky, Dmytro Mykhalyk and Yuri Humen* **Analyzing specifics of scalability laws for proper modeling of a system's throughput**	**https://youtu.be/YFiZ0q0Xrhc**
7	11:20-11:30	*Yurii Palianytsia, Iaroslav Lytvynenko, Abdellah Menou, Grigorii Shymchuk and Andrii Dubchak* **Development of an algorithm for identification of damage types on the surface of sheet metal**	**https://youtu.be/8NapkjO6QhM**
8	11:30-11:40	*Yurii Klots, Nataliia Petliak, Serhii Martsenko, Vitaliy Tymoshchuk and Ievgen Bondarenko* **Machine Learning system for detecting malicious traffic generated by IoT devices**	**https://youtu.be/GGF4jcORLdA**

9	11:40-11:50	*Ivan Osiichuk, Vitaly Brevus, Dmytro Bishchak, Yaroslav Mashtaliar and Ivan Mudryk* **Leveraging graphics tablet and JPen library to detect essential tremor**	**https://youtu.be/fUy0yH4N_II**
10	11:50-12:00	*Ihor Javorskyj, Roman Yuzefovych, Oleh Lychak, Pavlo Semenov and Roman Slyepko* **Demodulation of the simulated periodically non-stationary random signal with Hilbert transform**	**https://youtu.be/H0lv7_-h56k**
	12:00-12:30	**Coffee brakes**	
11	12:30-12:40	*Ivan Stefanyshyn, Oleh Pastukh, Volodymyr Stefanyshyn, Ihor Baran and Igor Boyko* **Robustness of AI algorithms for neurocomputer interfaces based on software and hardware technologies**	**https://youtu.be/zVJLURclYXw**
12	12:40-12:50	*Lyubomyr Mosiy, Halyna Kozbur, Iryna Strutynska, Olha Mosiy and Vasyl Yatsyshyn* **Information technology to support the digital transformation of small and medium-sized businesses**	**https://youtu.be/lUvJLHZps3w**
13	12:50-13:00	*Ostap Stets, Ihor Konovalenko, Tomasz Gancarczyk and Artur Mykytyshyn* **Face anti-spoofing systems optimal threshold selection criteria**	**https://youtu.be/mxbUoWqCm18**
14	13:00-13:10	*Mykhailo Rokosh, Mykola Pryimak and Nataliia Stadnyk* **Generative AI and Its Impact on Labor Productivity and the Global Economy**	**https://youtu.be/Yv_Q7aYcNSI**
15	13:10-13:20	*Qiong He, Caixiao Ouyang, Chunzhi Wang and Lingyu Yan* **Critical Flow Rerouting Based on Policy Gradient algorithm**	**https://youtu.be/Cj2Q4gTyupo**
16	13:20-13:30	*Yanlie Zheng, Xueying Li and Qingxia Shen* **Course contrastive recommendation algorithm based on hypergraph convolution**	**https://youtu.be/rohDuHUKxPo**

June 13

YouTube: https://youtu.be/wWOynGbPZz0

Time		Report	YouTube link
	10:45-11:00	**Registration of workshop participants**	
1	11:00-11:10	*Dmytro Dmytriv, Oleksii Duda, Pavlo Dudkin, Andrii Kryskov and Olga Perenchuk* **Industry 4.0 technologies for smart households**	**https://youtu.be/nAGQjUqZLJc**
2	11:10-11:20	*Liliia Khvostivska, Mykola Khvostivskyi and Iryna Dediv* **Mathematical, algorithmic and software support for signals wavelet detection in electronic communications**	**https://youtu.be/3MLiztQ1UMs**
3	11:20-11:30	*Oles Hospodarskyy, Vasyl Martsenyuk, Nataliia Kukharska, Andriy Hospodarskyy and Sofiia Sverstiuk* **Understanding the Adam Optimization Algorithm in Machine Learning**	**https://youtu.be/Y5yW84ZRkFo**
4	11:30-11:40	*Pavlo Tymkiv, Aleksandra Kłos-Witkowska, Zhanna Babiak, Viktor Koshelyuk and Andriy Holovko* **Robotic Arm Concept for Surgery: Integrating of 3D Printing and IoT Technologies**	**https://youtu.be/VQwPoZ5Rv3I**
5	11:40-11-50	*Mykhaylo Strembitskyi, Mykhaylo Palamar, Vitalii Batiuk, Andrii Chaikovskyi and Iryna Plavutska* **Information System for Detecting Low-Flying Air Targets and Predicting Support Trajectory**	**https://youtu.be/yez_eCk9b0A**
6	11:50-12:00	*Leonid Romaniuk, Marcin Bernas, Vitalii Kartashov, Ihor Chykhira and Halyna Tulaidan* **Aircraft automation principles as a basis for the use of information technologies**	**https://youtu.be/4g2sGit1-7g**
	12:00-12:30	**Coffee brakes**	
7	12:30-12:40	*Halyna Nahorniak, Andriy Sverstiuk, Liudmyla Maliuta, Viktor Khomyshyn and Katerina Hannouf* **Structure and Regularities of Development Information and Intellectual Capital Taking Into Account Acceleration of Digital Transformations in Conditions Information Society**	**https://youtu.be/iD4B0plH6wI**
8	12:40-12:50	*Mykhaylo Petryk, Vitaly Brevus, Mykhaylo Bachynskyi, Andre Pierre Legrand and Mykola Zaiarnyi* **Multi-sensor analysis of cognitive signals for neurological disorders and diseases**	**https://youtu.be/Vfss11oyqRY**

9	12:50-13:00	*Bohdan Orobchuk, Oleh Buniak, Ivan Sysak, Serhii Babiuk, Ihor Bodnarchuk and Vadym Koval* **Development of Software for the Implementation of Automated Reserve Input Modes Operation**	**https://youtu.be/c-BJ7S8rxy8**
10	13:00-13:10	*Andrii Stanko, Wojciech Wieczorek, Andrii Mykytyshyn, Oleksandr Holotenko and Taras Lechachenko* **Real-time air quality management: Integrating IoT and Fog computing for effective urban monitoring**	**https://youtu.be/vpSaQC-PK7U**
11	13:10-13:20	*Yuriy Skorenkyy, Viktor Voroshchuk, Tetiana Vitenko and Oleksandr Kramar* **Development of digital twin interface for Industry 4.0 production line**	**https://youtu.be/fVt2qngnrCA**
12	13:20-13:30	*Zhihua Yu, Can Zhou and Wenbin Xiao* **Optimal Control Scheme for Signalized Intersection Based on Phase Stream Combination in Autonomous Driving Environment**	**https://youtu.be/bIAh6OH7fV4**
13	13:30-13:40	*Yan Zhou, Jie Zhong, Xin Fang, Juan Huang and Lingyu Yan* **A study on rapid identification of medical vector organisms based on improved Transformer**	**https://youtu.be/3SijgkuTOyY**

June 14

(Final session)

YouTube: https://youtu.be/EgAq2Sx6VK0

Attention!

During the workshop, changes are possible in accordance with the situation in Ukraine. In particular, in the case of air alarms, there will be breaks and continuation of the workshop will be after the air alarms are over

Organized by:

Ternopil Ivan Puluj National Technical University,

Faculty of Applied Information Technologies and Electrical Engineering