



TO THE TENTH ANNIVERSARY OF THE FACULTY OF INFORMATION TECHNOLOGY

**TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV
(FACULTY OF INFORMATION TECHNOLOGY,
FACULTY OF COMPUTER SCIENCE AND CYBERNETICS)**

**NATIONAL TECHNICAL UNIVERSITY OF UKRAINE
"IGOR SIKORSKY KYIV POLYTECHNIC INSTITUTE"
VIKTOR GLUSHKOV INSTITUTE OF CYBERNETICS OF THE NAS OF UKRAINE
INSTITUTE OF INFORMATION TECHNOLOGY AND LEARNING TOOLS
OF THE NAES OF UKRAINE
INSTITUTE FOR INFORMATION RECORDING OF THE NAS OF UKRAINE
INSTITUTE OF SOFTWARE SYSTEMS OF THE NAS OF UKRAINE**

PROGRAM

International Workshop Dynamical System Modeling and Stability Investigation DSMSI-2025 May 8-10, 2025



Contact details**Address:**

Taras Shevchenko National University of Kyiv, Kyiv

- 24 B. Gavrilishyna St., Faculty of Information Technology;
- 4d Akademika Glushkova Ave., Faculty of Computer Science and Cybernetics

E-mail: oleksiibychkov@knu.ua

Tel.: +380 66 4305432



PROGRAM COMMITTEE



General Chairs

- **Prof. Denys Khusainov** Taras Shevchenko National University of Kyiv, Ukraine

Co-chairman

- **Prof. Vitaliy Snytyuk**, Taras Shevchenko National University of Kyiv, Ukraine
- **Assoc. Prof. Olena Kashpur**, Taras Shevchenko National University of Kyiv, Ukraine

International Program Committee

Prof. Peter Benner, director of Max Planck Institute for Dynamics of Complex Technical Systems in Magdeburg, Germany

Prof. Leonid Berezansky, Ben-Gurion University of the Negev, Be'er Sheva, Israel

Prof. Martin Bohner, Missouri University of Science and Technology, USA

Prof. Elena Braverman, University of Calgary, Canada

Prof. Josef Diblik, Brno University of Technology, Brno, Czech Republic

Prof. Alexander Domoshnitsky, Ariel University of Samaria, Ariel, Israel

Prof. Dmitriy Klyushin, Taras Shevchenko National University of Kyiv, Ukraine

Prof. Yurii Krak, Taras Shevchenko National University of Kyiv, Ukraine

Prof. Oleksandr Marchenko, Taras Shevchenko National University of Kyiv, Ukraine

Prof. Vasyl Martsenyuk, University of Bielsko-Biala, Poland

Prof. Mykola Nikitchenko, Taras Shevchenko National University of Kyiv, Ukraine

Dr. Michael Pokojovy, Associate Professor of Data Science and School of Data Science Statistics Fellow at Old Dominion University, Norfolk, USA

Prof. Alexandra Rodkina, The University of the West Indies at Mona, Kingston, Jamaica

Prof. Zdenek Smarda, Brno University of Technology, Brno, Czech Republic

Doc. RNDr. Zdeněk Svoboda, CSc., Brno University of Technology, Brno, Czech Republic



Organizing committee

Brazhenenko M. (Kyiv, Ukraine)

Cherevko I. (Chernivtsi, Ukraine)

Chikrii A. (Kyiv, Ukraine)

Dimitrov G. (Sofia, Bulgaria)

Dzhalladova I. (Kyiv, Ukraine)

Khoroshun D. (Kyiv, Ukraine)

Kovtun O. (Kyiv, Ukraine)

Liashenko O. (Kyiv, Ukraine)

Limarchenko O. (Kyiv, Ukraine)

Martynyuk A. (Kyiv, Ukraine)

Mazko O. (Kyiv, Ukraine)

Merkulova K. (Kyiv, Ukraine)

Nikolaenko A. (Kyiv, Ukraine)

Petrivskyi V. (Kyiv, Ukraine)

Porev G. (Kyiv, Ukraine)

Pylypenko G. (Kyiv, Ukraine)

Shkilniak S. (Kyiv, Ukraine)

Tkachenko O. (Kyiv, Ukraine)

Tymchuk O. (Kyiv, Ukraine)

Zhuk D. (Mykolaiv, Ukraine)



CONFERENCE TIMETABLE



Thursday, May 8, 2025

Plenary sessions 12:00 – 14:00
Track sessions 14:00 – 17:00

Friday, May 9, 2025

Plenary sessions 12:00 – 14:00
Track sessions 14:00 – 16:30

Saturday, May 10, 2025

Conference closing 12:00 – 12:30



CONFERENCE PROGRAMME



8

May

Thursday

OPENING OF THE CONFERENCE

(12:00 – 12:15)

Congress hall, Faculty of Information Technology, 4 floor, Bohdana Havrylyshyna 24, str., Kyiv, Ukraine

Moderator A. Shatyrko

Welcome speech:

Ganna TOLSTANOVA, Vice-Rector for Reserch, Taras Shevchenko National University of Kyiv

Olena KASHPUR, Dean of the Faculty of Computer Science and Cybernetics, Taras Shevchenko National University of Kyiv

Vitaliy SNYTYUK, Dean of the Faculty of Information Technology, Taras Shevchenko National University of Kyiv

PLENARY SESSIONS

(12:30 – 14:00)

Congress hall, Faculty of Information Technology, 4 floor, Bohdana Havrylyshyna 24, str., Kyiv, Ukraine

Head: **Andriy SHATYRKO** Secretary: **Volodymyr PETRIVSKYI**

(12:30 – 12:50)

Ihor Cherevko, Svitlana Ilika.

Approximation of systems with delay and their application

(12:50 – 13:10)

Denys Khusainov, Sergey Chuiko, Daria Diachenko

Green operator of a linear Noetherian boundary value problem for a matrix differential-algebraic equation

(13:10 – 13:30)

Peter Benner, Sergey Chuiko, Olga Nesmelova

Spline-Based Solution of Nonlinear Periodic Boundary Value Problems for the Lienard Equation with Switching

(13:30 – 13:50)

Grygorii Diachenko, Ivan Laktionov, Oleksandr Vovna, Oleksii Bychkov, Anna Maryna

A Data-Driven Method for Software-Based Predicting the Risk of Fusarium Head Blight in Maize

COFFEE BREAK (13:50 –14:00)

8

May

Thursday

May, 8, 2025 (14:00 – 16:30)
Tracks 1: Computer applied mathematics

Room 318, Faculty of Information Technology, 3 floor, Bohdana Havrylyshyna 24, str.,
Kyiv, Ukraine

Chairs: **Oleksandr VOVNA** Secretary

1.	(14:00 – 14:15) Anastasiia Melnyk, Iryna Rozora	Statistical Inference for Impulse Response Functions
2.	(14:15 – 14:30) Oleksandr Zhabko, Grygorii Diachenko, Oleksandr Vovna, Volodymyr Kremnov, Oleksii Bychkov	Software-based modeling and performance analysis of hybrid IoT networks for agricultural monitoring
3.	(14:30 – 14:45) Victor Kulian, Olena Yunkova , Maryna Korobova , Oleksiy Oletsky	Mathematical modeling and management of investment trajectories
4.	(14:45 – 15:00) Andrii Anikushyn, Andrii Bomba	Point control for nonlocal in time model of heat and mass transfer
5.	(15:00 – 15:15) Dmitriy Kadyntsev, Andrii Anikushyn, Viktoriia Nazarchuk	Optimal control for linear pseudo-parabolic systems: non-coercive diffusion case
6.	(15:15 – 15:30) Pavlo Lysyi, Dmitriy Klyushin	Architecture and Training Principles of Stable Diffusion
7.	(15:30 – 15:45) Vladimir Semenov, Serhii Denysov, Oleksandra Kovalenko	Descent property for extragradient algorithm and last-iterate convergence
8.	(15:45 – 16:00) Nikita Skybytskyi, Vladimir Semenov	Extreme Values of a Global Minimum Cut in Connected Regular Graphs
9.	(16:00 – 16:15) Oleg Barabash , Andrii Makarchuk , Oleh Kopiika , Serhii Bazilo , Yurii Kolomiets	Method of representing of indicator of functional stability of distributed information systems in time of working in autonomous mode

Tracks 2: Thursday, May 8, 2025
(14:00 – 16:30)
Intelligent Technologies in Computer Science.

Room 311, Faculty of Information Technology, 3 floor, Bohdana Havrylyshyna 24, str.,
Kyiv, Ukraine

Heads: **Olha Tkachenko** Secretary:

1.	(14:00 – 14:15) Oleksii Bychkov, Kateryna Merkulova, Yelyzaveta Zhabska, Ivan Ivanenko	Exploring Neural Network Methods for Software of Military Object Detection in UAV Images
----	---	--

2.	(14:15 – 14:30) Oleksandr Kornichuk, Maryna Graf	Enhancement of a Mathematical Model for a Method of Calculating the Reputation Index of Contractors in Public Procurement
3.	(14:30 – 14:45) Andriy Shatyrko, Andrii Ivanenko	Audio models for Object Identification
4.	(14:45 – 15:00) Serhii Perepelitsyn	Compromise Between Topology Connection, Load Balance and Wireless Sensor Networks'anomalies (WSN)
5.	(15:00 – 15:15) Andriy Shatyrko, Volodymyr Kuz	Automatic identification of musical instruments
6.	(15:15 – 15:30) Luka Kadyntsev, Volodymyr Petrivskyi	Analysis of News Messages Using the Sentiment Analysis Method
7.	(15:30 – 15:45) Miroslava Růžicková, Irada Dzhalladova, Oleg Kaminsky	Modeling Threat in Cyberspace with Markov Processes
8	(15:45 – 16:00) Oleksandr Drahan, Oleksandr Vovna, Oleksii Bychkov	Planning of the air situation and the location of radar equipment on the electronic map
9	(16:00 – 16:15) Oleksandr Rozdobudko , Volodymyr Petrivskyi)	Using Fuzzy Logic Methods to Prioritize Areas Based on Drone Information
10	(16:15 – 16:30) Vasyl Plisyuk, Olha Tkachenko	Using Data Compression and Aggregation Methods in Dynamical System Modeling
11	(17:00 – 17:15) Danylo Sheludko, Olha Tkachenko	The Impact of Game-Based Environments on Spatial Thinking: Investigating the Potential Influence

9 May Friday	
PLENARY SESSIONS (12:00 – 13:20) Room 318, Faculty of Information Technology, 3 floor, Bohdana Havrylyshyna 24, str., Kyiv, Ukraine Head: Andriy SHATYRKO Secretary: Volodymyr PETRIVSKYI	
(12:00 – 12:20)	Oleksii Bychkov, Taras Senysh Functionally Stability Software-Hardware Neural Network “Neurocomputer”
(12:20 – 12:40)	Ihor Cherevko, Halyna Melnyk, Vasyl Melnyk Cost-Sensitive Decision Trees with Prospect Theory for Churn Prediction
(12:40 – 13:00)	Volodymyr Petrivskyi, Yaroslav Petrivskyi, Mykhailo Tymchuk, Serhii Shmatiuk Software and Analytical Applied Technologies for Controlling the Efficiency of Leaching a Useful Component from a Technogenic Deposit

(13:00 – 13:20) Oleksandr Golubenko, Olha Tkachenko , Oleksandr Pidmohylnyi , Artem Antonenko A computer vision approach for detection of asteroids comets		
COFFEE BREAK (13:50 –14:00)		
Tracks 1: May, 9, 2025 (14:00 - 16:30) Computer applied mathematics;		
Room 318, Faculty of Information Technology, 3 floor, Bohdana Havrylyshyna 24, str., Kyiv, Ukraine Chairs: Andrii SHATYRKO Secretary: Volodymyr PETRIVSKYI		
1.	(14:00 – 14:15) Roman Voliansky, Nina Volianska, Iurii Shramko, Andri Pranolo	Synchronization of Two Coupled Nonlinear Dynamical Systems
2.	(14:15 – 14:30) Irada Dzhalladova, Dmytro Zhuk	Model for Food Supply Chain Stability Under Climate Variability with Semi-Markov Processes
3.	(14:30 – 14:45) Andriy Shatyrko, Yaroslav Antonenko	Structural-Schematic Approach to Digital Filtering of Low-Frequency Signals
4.	(14:45 – 15:00) Vasyl Martseniuk, Serhii Potapenko, Olga Korzachenko Mykhailo Ahutin	Multiple Criteria Optimization Of The Advertising Process
5.	(15:00 – 15:15) Stepan Shkilniak, Oksana Shkilniak	Modal Systems with Separate Dominance of Experts in Logics of Partial Predicates
6.	(15:15 – 15:30) Anatolii Pashko, Vladyslav Miachkov	Creating captions in Ukrainian for images captioned in English
7.	(15:30 – 15:45) Tetiana Shakotko, Denys Khusainov	Problems of stability and convergence of dynamic processes in problems of neurodynamics
8	(15:45 – 16:00) Darya Alontseva, Alexander Krasavin, Albina Kadyroldina, Iurii Krak, Dana Baishuak	Coordinate free method for the identification of the plane curves and its applications to motion planning
9	(16:00 – 16:15) Nikolay Kiktev, Alla Dudnyk, Denys Zhuk, Oleksiy Opryshko, Andrii Petrenko, Artem Lutsyk	Detection of potential obstacles in a field image using the k-means method with cluster number optimization and inertial fall tracking
Tracks 2: May, 9, 2025 (14:00 - 16:30) Intelligent Technologies in Computer Science.		
Room 311, Faculty of Information Technology, 3 floor, Bohdana Havrylyshyna 24, str., Kyiv, Ukraine Chairs: Oleksii Bychkov Secretary: Volodymyr Petrivskyi		
1	(14:00 – 14:15) Nikolay Kiktev, Danylo Hrado-boiev, Natalia Pasichnyk, Maksym Petrenko, Boris Hrudynin, Andrii Dovhopoliuk	Machine learning applied to digital terrain mapping to identify mouse mounds in crop production

2	(14:15 – 14:30) Andrii Suboch, Anna Pylypenko, Oleg Kurchenko	A Quantitative Assessment of Latent Dirichlet Allocation for Topic Modeling in Multi-Class Text Datasets
3	(14:30 – 14:45) Kseniia Dukhnovska, Oksana Kovtun, Anna Pylypenko, Iryna Yurchuk, Olga Gurnik	Mathematical Model of Plant Diseases Classifier for Smart Agriculture implemented on Small-Edge Devices
4	(14:45 – 15:00) Iryna Lybak, Kateryna Merkulova	Analysis of Mathematical Methods for Strategic Management in Higher Education Institutions
5	(15:00 – 15:15) Anastasiya Vecherkovskaya, Serhii Dotsenko	On the construction of stable matchings in the algorithm for the optimal testing problem
6	(15:15 – 15:30) Yaroslav Petrivskyi, Oleksii Bychkov, Oleksandr Pyzh	Information Technology and Software For Improving The Accuracy Of Object Localization
7	(15:00 – 15:15) Kyryl Petrachyk, Iryna Yurchuk, Anastasiia Nikolaenko	Gradient zoning and density-controlled procedural urban planning using Voronoi diagrams
8	(15:15 – 15:30) Yuri Krak, Yernar Seksenbayev, Saule Kudubayeva	Real-Time Multimodal Emotion Recognition System: Integration of Facial Expressions, Depth Maps, and Audio Signals
9	(15:30 – 15:15) Andriy Shatyrko, Volodymyr Kovtun, Bedrich Puza, Veronika Novotna	Modeling of Transport Flows in Critical Situations
10	(15:30 – 15:45) Nikolay Kiktev, Taras Lendiel, Yevhenii Rezvin, Pavel Mazurchuk	Model of a Computer-Integrated Subsystem for Monitoring the Temperature Regime in a Biogas Plant
11	(15:45 – 16:00) Oleksandr Snitsarenko	Propaganda Detection on Telegram during the Russia-Ukraine War using Transformers. Comprehensive Dataset Creation Algorithm
12	(16:00 – 16:15) Maksym Sukalo, Dmytro Novak, Andrii Moshenskyi, Vladyslava Skidan, Antonina Volivach	Sensor-Driven Artificial Lighting Analysis in Buildings Using IoT and AI
13	(16:15 – 16:30) Bychkov O., Lytvynchuk Kh.	Perceptive elements and perceptive sets – a mathematical formalism for describing fuzziness
	(16:30 – 16:45) Bychkov O., Moroz S.	A positively defined coordinate system as the basis for positively significant computations

10
May

Saturday

Conference closing
(12:00 – 12:30)

Congress hall, Faculty of Information Technology, 4 floor, Bohdana Havrylyshyna 24, str., Kyiv, Ukraine

Moderator A. Shatyrko

