



Technical University of Sofia
Faculty of Computer Systems and
Technologies



PROGRAM

2024 12th International Scientific Conference

COMPUTER SCIENCE

13 – 15 September 2024

organized by

the Faculty of Computer Systems and Technologies

Technical University of Sofia

IEEE Bulgaria Section



The 2024 12th International Scientific Conference "Computer Science", organized by the Faculty of Computer Systems and Technologies at the Technical University of Sofia, Bulgaria, continues the tradition of a series of eleven conferences organized between 2004 and 2023 as a scientific forum to present a discussion of innovative ideas, concepts and technologies in the field of computer science, computer and software engineering, information technology and their application. Participation in the conference of researchers from different countries stimulates the building of a scientific community and encourages interaction and international cooperation.

The 2024 12th International Scientific Conference "Computer Science" is part of the "Science Days of TU-Sofia" forum.

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2024 12th International Scientific Conference COMPUTER SCIENCE, 13 – 15 September, Sozopol, Bulgaria

Friday, 13th September 2024

Hall 1, Hotel "Lazur", Sozopol, Bulgaria

Virtual MS Teams meeting

14:00 – 16:00	Registration
16:00 – 16:30	Official Conference Opening
16:30 – 18:30	Plenary Session, Invited talks
19:30 – 22:30	Conference Dinner

Saturday, 14th September 2024

Hall 1, Hotel "Lazur", Sozopol, Bulgaria

Virtual MS Teams meeting

9:30 – 11:00	Section "Artificial Intelligence, Robotics And Control", Session 1
11:00 – 11:30	Coffee break
11:30 – 13:00	Section "Artificial Intelligence, Robotics And Control", Session 2
13:00 – 14:00	Lunch break
14:00 – 15:30	Sections "Education 4.0", "Human-Centered Computing", "Software Engineering"
15:30 – 16:00	Coffee break
16:00 – 17:00	Section "Cyber Security and Cyber Protection"
17:00 – 18:30	Section "Software Technologies and Applications Systems"
19:30 – 22:30	Conference Dinner

Sunday, 15th September 2024

Hall 1, Hotel "Lazur", Sozopol, Bulgaria

Virtual MS Teams meeting

9:30 – 11:00	Poster Sessions, Sections "Artificial Intelligence, Robotics and Control", "Cyber Security and Cyber Protection", "Software Technologies and Applications Systems", "Data Structures and Storage, Cloud and Block Chain Technologies", "Education 4.0"
11:00 – 11:30	Coffee break
11:30 – 12:30	Workshop "Universities and Business Collaboration in IT education – Perspectives and Challenges"
12:30 – 13:30	Workshop "Centres of Excellence and Research Projects in TU-Sofia"
13:30 – 14:30	Lunch break
14:30	Official Conference Closing Ceremony

Link for Virtual MS Teams meeting:

<https://teams.microsoft.com/l/meetup-join/19%3aQuGStdT1hn2hnpjzkw4yf8lvxK16vpDjMYA8zQICTE1%40thread.tacv2/1725208812004?context=%7b%22id%22%3a%227feeb5c0-34f4-4a4b-8cc0-e59f06920156%22%2c%22oid%22%3a%226a932676-d9f2-42ef-943f-cad9f37b156a%22%7d>

Friday, September 13th, 2024

14:00 – 16:00 Registration

Hall 1, Hotel "Lazur", Sozopol, Bulgaria

16:00 – 16:30

Official Conference Opening

Chair: Prof. Dgnyan Nakov

Hall 1, Hotel "Lazur", Sozopol, Bulgaria and virtual MS Teams meeting

16:30 – 18:30

Plenary Session, Invited talks

Chair panel: *Assoc. Prof. Nikolay Hinov, Prof. Milena Lazarova*

Hall 1, Hotel "Lazur", Sozopol, Bulgaria and virtual MS Teams meeting

Digital Twin of Varna Bay and its Applications

Prof. Todor Ganchev

Technical University of Varna, Bulgaria

Artificial Intelligence in the Controlled Nuclear Fusion Reactions

Prof. Dimiter Alexandrov

Lakehead University, Canada

19:30 Conference Dinner

Saturday, September 14th, 2024

Hall 1, Hotel "Lazur", Sozopol and virtual MS Teams meeting

9:30 – 11:00

SECTION "ARTIFICIAL INTELLIGENCE, ROBOTICS AND CONTROL", Session 1

Chair: Prof. Milena Lazarova, Assoc. Prof. Dilyana Budakova

1. Credit Policy for Irregular Incomes
Todar Stoilov, Krasimira Stoilova
2. Quantitative Forecast of the Milk Price of a Dairy Farm
Krasimira Stoilova, Todar Stoilov
3. FusionSegNet: Integrating Modalities for Enhanced Brain Tumor Detection and Segmentation
Sonia D'Silva, Husain Rehmanji, Kunj Thakker, Sudhir Bagul
4. TransConvNet: Enhancing Kidney Abnormality Detection in CT Imaging through Hybrid Transformer-CNN Model with Integrated Explainability
Mohamedelfateh T. M. Saeed, Mosab Aboidrees Altraifi Yousif, Ahmed A. M. Hakim
5. Hybrid Machine Learning and Deep Learning CNN Models for Apple Trees Leaves Pathologies
Petar Matov, Milena Lazarova, Simona Petrakieva, Ina Tarlova
6. Challenges Regarding AI Integration in V2X Communication
Dimitar Andreev, Rumen Trifonov, Milena Lazarova

11:00 – 11:30

Coffee break

11:30 – 13:00

SECTION "ARTIFICIAL INTELLIGENCE, ROBOTICS AND CONTROL", Session 2

Chairs: Assoc. Prof. Dilyana Budakova, Prof. Milena Lazarova

7. Improvement of Human Activity Recognition (HAR) Performance by Utilizing LSTM in the Structure of Progressive Learning
Ahmed Abdelwahab Mahgoub Hakim, Solen Kumbay Yildiz, Atila Yilmaz, Mohamedelfateh Tagalsir Maroof Saeed
8. An Approach to Modeling and Studying the Behavior of Firefighting Drones Using Unity ML-Agents
Georgi Harbaliev, Velyo Vasilev, Dilyana Budakova
9. Energy-Efficient Prediction of Hourly Energy Consumption in Fog/Edge Computing Using Optimized Artificial Neural Networks
Hussam Fakhour, Faten Hamad
10. Hybrid Four Vector Intelligent Optimizer with SaDE for Solving Robot Gripper Optimization Problem
Hussam Fakhouri, Faten Hamad
11. Bulgarian Banknotes Denomination Classification using Transfer Learning
Mira Nayef, Iva Nikolova, Georgi Zapryanov
12. Smart systems for smart homes: optimization through chatbots and interactive data analysis
Ivo Gergov

13:00 – 14:00

Lunch break

14:00 – 15:30

SECTION “EDUCATION 4.0”

SECTION “HUMAN-CENTERED COMPUTING”

SECTION “SOFTWARE ENGINEERING”

Chair: Prof. Rumen Trifonov, Assoc. Prof. Galya Pavlova

1. Enhancing University Students' Activities with Interactive Immediate Feedback Using Customized LLMs
Venka Andonov
2. Vocational, Formal and Non-formal Education and Training – the Adequate Response to Education 4.0
Maria Kazakova
3. Directing Analysis on Conducted Experiments for Researching the Effects of Training with a video game
Georgi Tsochev, Teodor Ukov, Alexander Rusev, Maksim Sharabov, Roumen Trifonov
4. Methods and Means of Verification for Semantic Interoperability Compliance
Lyuba Blagoev, Roumen Trifonov, Kamen Spassov
5. Architecture for Semantic Interoperability in the E-Governance Environment
Lyuba Blagoev, Roumen Trifonov, Kamen Spassov

15:30 – 16:00

Coffee break

16:00 – 17:00

SECTION “CYBER SECURITY AND CYBER PROTECTION”

Chair: Assoc. Prof. Valentin Hristov

1. Investigation of Time for Conducting a Successful DDoS Attacks in IIoT Network
Aleksandar Hristov, Valentin Hristov
2. Analysis of Cybersecurity Competencies as a Factor for Organizations' Cyber Defense
Katya Kirilova
3. StealthGuard: Advanced Detection and Classification of Fileless Malware and URL Phishing
Priya Mali, Parth Shirole, Batoool Khan, Varshapriya Jyotinagar

17:00 – 18:30

SECTION “SOFTWARE TECHNOLOGIES AND APPLICATIONS SYSTEMS”

Chair: Assoc. Prof. Galya Pavlova, Prof. Rumen Trifonov

1. Integration of Methodology and Criteria for Determining Innovative Schools through an electronic platform
Natalia Mihalevska, Nadezhda Angelova, Galya Pavlova, Plamen Nakov
2. Strategy for Selecting a Widely-Applicable Algorithm for Finding Semantic Relationships Between Products in the Field of E-Commerce
Venelin Rangelov, Rumen Trifonov, Galya Pavlova
3. Overview of Existing Algorithms for Determining Semantic Relatedness of Products
Venelin Rangelov, Rumen Trifonov, Galya Pavlova
4. Windows Application for Calculation of Markov's Chains Characteristics
Valentin Hristov, Georgi Matsinski, Aleksandar Hristov
5. Color Errors Generated Due to Color Space Transformation
Stefan Angelov, Milena Lazarova

19:30

Conference Dinner

Sunday, September 15th, 2024

Hall 1, Hotel "Lazur", Sozopol and virtual MS Teams meeting

POSTER SESSIONS

9:30 – 11:00

**SECTIONS "ARTIFICIAL INTELLIGENCE, ROBOTICS AND CONTROL",
"CYBER SECURITY AND CYBER PROTECTION",
"SOFTWARE TECHNOLOGIES AND APPLICATIONS SYSTEMS",
"DATA STRUCTURES AND STORAGE, CLOUD AND BLOCK CHAIN
TECHNOLOGIES", "EDUCATION 4.0"**

Chair: Prof. Georgi Popov

1. Design and Realization of a IoT Remote Car Diagnostics via OBD 2 Interface
Neven Nikolov, Daniela Gotseva
2. Risks and Challenges of Using AI in Healthcare
Vanya Samokisheva, Roumen Trifonov, Galya Pavlova
3. The First AI Created Will Be the Only AI Ever Created
Dimitar Dobrev, George Popov
4. An Approach to Investigating Plagiarism in Artificial Intelligence Content
Daniela Minkovska, Elena Antonova, Kiril Koparanov, Plamen Nakov
5. Problems and Solution in Ensuring Cyber-Security of IoT Devices for the Needs of Small and Medium Enterprises
Plamen Stanchev, Yavor Tomov, Nikolay Hinov
6. Cyber Security in School – Digital Competence Framework for Citizens and Teacher's Attitude
Yanka Totseva
7. Opportunities to Improve the Cybersecurity of Software Applications
Gabriela Naskova
8. Study of Basic Concepts in the Context of Process Management and Strategies Based on Big Data
Bohdan Danov, Daniela Gotseva
9. Reliability Study in Buck DC-DC Converter
Plamen Stanchev, George Popov, Kamelia Raynova, Nikolay Hinov
10. Software Environment for Automated Experiments with DC/DC Converters
Anton Dekov, Nikolay Hinov, Tsveti Hranov
11. Restricting Authentication Based on Stress Index Using Wearable Devices
Firas Al-Husari, Ognyan Nakov, Natalia Mihalevska

11:00 – 11:30

Coffee break

- 11:30 – 12:30** **WORKSHOP “UNIVERSITIES AND BUSINESS COLLABORATION IN IT EDUCATION – PERSPECTIVES AND CHALLENGES”**
Chair panel: Prof. Ognyan Nakov
- 12:30 – 13:30** **WORKSHOP “CENTRES OF EXCELLENCE AND RESEARCH PROJECTS IN TU-SOFIA”**
Chair panel: Prof. Nikolay Hinov
- 13:30 – 14:30** Lunch break

14:30

Official Conference Closing Ceremony

Chair: Assoc. Prof. Nikolay Hinov

Hall 1, Hotel “Lazur”, Sozopol and virtual MS Teams meeting



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Guest Editors:

**Assoc. Prof. Dr. Nikolay Hinov, Prof. Dr. Ognyan Nakov.
Prof. Dr. Milena Lazarova**

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