# CSCS24
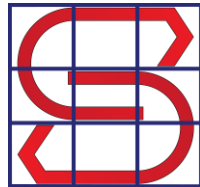# 24th INTERNATIONAL CONFERENCE ON CONTROL SYSTEMS AND COMPUTER SCIENCE

**May 24-26, 2023**
**University POLITEHNICA of Bucharest**
**Romania**

# PROGRAMME

# Message from CSCS24-2023 Conference Chairs

We are honored and delighted, on behalf of the CSCS24 2023 Organizing Committee, to welcome you to the 24th International Conference on Control Systems and Computer Science, which is hosted by the University Politehnica of Bucharest campus, Romania, from May 24 to May 26, 2023. The CSCS24 conference continues a tradition of more than 48 years as a biennial international event.

The main scope of CSCS is to cluster the latest research topics relevant to both Computer Science and Control Systems and to encourage the submission of ongoing work, as well as position papers and case studies of existing projects. The 2023 edition of CSCS is mainly focused on intelligent information technologies and applied control systems, as a common thread, which leads to advances in fundamental and applied research in control systems and computer science. Moreover, the conference offers a forum for both academics and practitioners to share their experiences and identify new and emerging trends, to cooperate and share new research directions and innovative programs.

Over the years, CSCS has been the premier and the avant-garde international conference in Control and Computer Science organized in Romania, gathering the most prominent research and scientific contributions from all over the world. We have in mind and is our duty to remember, with profound respect, our colleagues that have contributed to organizing this prestigious international conference. A special remember is for the first chairman of CSCS, Professor Simion Florea who was the initiator of this type of event.

We are proud to announce that the 2023 edition of the CSCS Conference is organized with IEEE technical co-sponsorship and the proceedings will be published by IEEE CPS and sent to be analyzed and indexed by IEEE Explore and by ISI Clarivate as Web of Science Proceedings. Also, the proceedings of the last editions of the CSCS conference (CSCS19-2013, CSCS20-2015, CSCS21-2017, and CSCS22-2019) were indexed by ISI Web of Science database and by IEEE Xplore, thus offering increased visibility and access to the research contributions. We are waiting for CSCS23-2021 to be indexed by ISI Web of Science (Clarivate).

The main sponsors of our conference are The Faculty of Automatic Control and Computers (A&C) of the University Politehnica of Bucharest and the Romanian Society of Control Engineering and Technical Informatics (SRAIT). Other sponsors of the conference are the Romanian Academy – Science and Information Technology Section, the IEEE Romania Section, the IEEE Romanian Chapter of Computer Society, and the Romanian Association for Artificial Intelligence (ARIA).

This edition of CSCS received more than 150 paper submissions (for the main track and workshops) from all over the world. Each submission was peer-reviewed by program committee members or invited external reviewers. Finally, we selected 102 papers (32 for the conference, 66 for the workshops, and 4 for the doctoral symposium) to be published in the proceedings and presented during the main sessions of the conference and workshops. The papers contained in these Proceedings cover a wide range of topics including Advanced Control Strategies, Systems and Signals, Cyber-Physical Systems, Distributed Computing, Network Control Systems, Hybrid Control Systems, Artificial Intelligence, Big Data and Analytics, Future Internet, Embedded Systems, Machine Learning, Computer Vision and Computer Graphics, Semantic Web, Security, System Software, System Engineering, and Theory.

*The 11th International Workshop on Interdisciplinary Approaches in Fractal Analysis (IAFA-2023)* is dedicated to the presentation and discussion of technical advances in fractal analysis and chaos theory methods for a wide array of applications in signal, image and multimedia processing, data mining and retrieval, complex systems modeling and others.

*The 10<sup>th</sup> International Workshop on Cyber-Physical Systems (IWoCPS-2023)* covers the latest advances in Cyber-Physical Systems. The aim is to stimulate research that will lead to the creation of responsive environments for networking and, in the longer-term, the development of Cyber-Physical Systems. We envision that the cyber-physical systems of tomorrow will far exceed those of today in terms of adaptability, autonomy, efficiency, functionality, reliability, safety, and usability.

*International Workshop on Interdisciplinary Applications of Artificial Intelligence (IA-AI-2023)* is a meeting place for professionals in collaborative systems, artificial intelligence and interdisciplinarity of this domain from academic and industry arenas. The aim for participants is to reflect, with theoretical and evidence-based arguments, on the potential of artificial intelligence applications to animate dialogue and learning across established information borders, and to uphold productive interactions in times of uncertainty, divergence, and transformation.

*International Workshop on Artificial Intelligence in Medicine & Healthcare (AIMH-2023)* brings together scientists and practitioners interested in presenting research and exchanging views on how to make a better use of Artificial Intelligence, including Machine Learning, in novel applications for medicine and healthcare, how to better exploit these technologies to provide qualified solutions for prognosis, prevention, improved disease detection, rehabilitation and enhanced service delivery in modern medicine and healthcare.

*International Workshop on Advance Control in Smart Grid (ACSG-2023)* will be a forum to discuss issues and effective strategies for the modernization of control approaches in the power system industry landscape due to the advent of information and communication technology and the emergence of renewable and distributed energy resources introduced in the smart grid development. It will include an emphasis on advanced distribution management systems, the integration of distributed energy resources, and the required approaches for the integration of storage units, electrical vehicles, or smart buildings.

*International Workshop on Smart Services for Edge and Cloud Computing (SSeCC-2023).* A major goal of the workshop is to explore new directions and approaches for reasoning about smart services for Edge and Cloud Computing, based on novel models, methods, and algorithms. The vision of Edge Computing considers that tasks are not exclusively allocated on centralized Cloud platforms but are distributed toward the edge of the network (as in the Internet-of-Things and Fog Computing paradigms) and transferred closer to the business thanks to Content Delivery Networks. The workshop is organized in collaboration with National Institute for Research and Development in Informatics (ICI), Bucharest.

*International Workshop on Cyber Security and Resilience of Large-Scale Distributed Systems (CSR-LSDS-2023).* Critical Cyber-physical systems represent large-scale distributed systems that are composed of multiple IoT networks that are vital for the good functioning of human-needed systems such as transportation systems, industrial systems, or smart grids. One important aspect that researchers must focus on is the security component of such systems, especially when interconnected with the Internet.

*International Workshop on Monitoring and EviDEnce-based protocols, applications and platforms for active living and Aging (MEDEA-2023).* MEDEA is a venue for practitioners in the field to present results on management approaches, applications, and technologies to satisfy these requirements and thus enable the widespread usage of AAL systems. It covers different aspects related to the planning and operation of AAL monitoring platforms and the corresponding applications and services. The workshop is organized by National Institute for Research and Development in Informatics (ICI), Bucharest.

*International Workshop on Trends in Computer Science and Engineering Education (CSE-Edu-2023)* is organized by the Computer Science department from University Politehnica of Bucharest with the main scope to highlight the new trends in computer science education, distributed systems,

brain-computer interface, e-learning, opening a round table with discussions and debates about education in computer science and engineering at bachelor, master, and Ph.D. levels.

*International workshop on Environment Control Systems (ENV-2023)*. The purpose of this workshop is to discuss the methods and principles that are used to understand environmental processes and to show how they are used to solve new environmental problems that are becoming more and more complex with the expansion and diversification of industrial technologies.

*The Doctoral Symposium* has the purpose to provide Ph.D. students, and their advisors, a setting where they can, in-person, informally, expose and discuss their work, collect valuable opinions, and share new ideas, methods, and applications, bringing together the scientific community and giving them the opportunity to learn new insights, ranging from research topics to diversity challenges in technology and innovation.

We are honored to have four invited keynote speakers: *Sean McGuire* (NVIDIA Higher Education & Research, Europe, Middle East, and Africa) presenting "Artificial Intelligence in Scientific Research"*; Marius Stan* (Argonne National Laboratory, University of Chicago (retired), Chicago, IL, USA) discussing about "Artificial Intelligence for Material Design and Real-Time Manufacturing Optimization"; *Sergiu Dascalu* (Department of Computer Science and Engineering, University of Nevada, Reno, USA) with a presentation on "Brain Computer Interfaces: Progress, Promises & Challenges"; and *Ovidiu Daescu* (Department Head, Jonsson School Endowed Chair, University of Texas at Dallas) with the keynote "Knowledge First and Data First Automated Decision Support".

Organizing this international conference for many years is a collective effort. We want to thank the workshop organizers and workshop committee members for carefully reviewing the papers. We are honored to thank all the members of the organization committee and program committee, as well as all the reviewers, for their hard work in finalizing the reviews on time, and the authors for submitting their papers. This wonderful community of researchers contributes to the success of this event. We also express our gratitude and thank all members of the local organizing committee for their valuable contribution to this successful event.

The editors would like to thank to Cristina Ceballos (IEEE CPS Production Editor) for the editorial assistance and excellent cooperative collaboration to produce this valuable scientific work. We express our thanks to all IEEE representatives who help us during the production of this conference. We appreciate the support offered by the EasyChair system team to handle the paper submission, review process, and communications with authors and reviewers. We thank them for this important support.

We hope you will enjoy the conference together with us and we hope to establish new connections and collaborations during this event.

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**Conference website and e-mail**
http://cscs24.hpc.pub.ro
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## CSCS24 SESSIONS

- **A1 - Control System Design**
  Session Chairs: *Bogdan Dumitrescu* (University Politehnica of Bucharest, Romania)
  *Grigore Stamatescu* (University Politehnica of Bucharest, Romania)

- **A2 – Advanced Control Strategies**
  Session Chairs: *Valentin Sgârciu (University Politehnica of Bucharest, Romania),*
  *Ion Fiodorov* (Technical University of Moldova, Rep. Moldova)

- **A3 - Control Applications**
  Session Chairs: *Monica Drăgoicea* (University Politehnica of Bucharest, Romania)
  *Andreea Udrea* (University Politehnica of Bucharest, Romania)

- **C1 - Modern Distributed Systems**
  Session Chairs: *Ciprian Dobre* (University Politehnica of Bucharest, Romania)
  *Radu-Ioan Ciobanu* (University Politehnica of Bucharest, Romania)

- **C2 - Software Systems**
  Session Chairs: *Nicolae Țăpuș* (University Politehnica of Bucharest, Romania)
  *Costin Carabaș* (University Politehnica of Bucharest, Romania)

- **C3 - Computational Intelligence**
  Session Chairs: *Mihai Nan* (University Politehnica of Bucharest, Romania)
  *David-Traian Iancu* (University Politehnica of Bucharest, Romania)

- **C4 – Applications**
  Session Chairs: *Mariana Mocanu* (University Politehnica of Bucharest, Romania)
  *Nirvana Popescu* (University Politehnica of Bucharest, Romania)

- **C5 - Security**
  Session Chairs: *Răzvan Rughiniș* (University Politehnica of Bucharest, Romania)
  *Dumitru-Cristian Trancă* (University Politehnica of Bucharest, Romania)

## CSCS24 DOCTORAL SYMPOSIUM (CSCS-DS-2023)

Symposium Chairs: *Bogdan Dumitrescu* (University Politehnica of Bucharest, Romania)
*Florin Pop* (University Politehnica of Bucharest, Romania)

## WORKSHOPS

**The 11th International Workshop on Interdisciplinary Approaches in Fractal Analysis – IAFA-2023**

Workshop organizers: *Ștefan Mocanu* (University Politehnica of Bucharest, Romania)
*Loretta Ichim* (University Politehnica of Bucharest, Romania)

- **IAFA-1: Fractal Approaches in Medicine and Health**
  Section Chairs: *Dan Popescu* (University Politehnica of Bucharest, Romania)
  *Loretta Ichim* (University Politehnica of Bucharest, Romania)

- **IAFA-2: Fractals and Complexity**
  Section Chairs: *Sei-Ichi Tsujimura* (Nagoya City University, Japan)
  *Radu Dobrescu* (University Politehnica of Bucharest, Romania)

- **IAFA-3: Fractals in Industry**
  Section Chairs: *Ștefan Mocanu* (University Politehnica of Bucharest, Romania)
  *Nicoleta Angelescu* (Valahia University of Târgoviște, Romania)

**The 10th International Workshop on Cyber Physical Systems – IWoCPS-2023**

Workshop organizers: *Ioan Dumitrache* (University Politehnica of Bucharest, Romania)
*Ioan Sacală* (University Politehnica of Bucharest, Romania)
*Mihnea Alexandru Moisescu* (University Politehnica of Bucharest, Romania)

- **IWoCPS-1: Design of Cyber-Physical Systems**
  Section Chairs: *Ioan Dumitrache* (University Politehnica of Bucharest, Romania)
  *Ioan Sacală* (University Politehnica of Bucharest, Romania)

- **IWoCPS-2: Applications of Cyber-Physical Systems**
  Section Chairs: *Mihnea Alexandru Moisescu* (University Politehnica of Bucharest, Romania)
  *Alexandra Cernian* (University Politehnica of Bucharest, Romania)

**The 8th International Workshop on Environment Control Systems – ENV-2023**
Workshop organizers:
*Costică Nitu* (University Politehnica of Bucharest, Romania)
*Alexandru Dumitraşcu* (University Politehnica of Bucharest, Romania)

**The 5th International Workshop on Interdisciplinary Applications of Artificial Intelligence – IA-AI-2023**
Workshop organizers:
*Răzvan Rughiniş* (University Politehnica of Bucharest, Romania)
*Ştefan Trăuşan-Matu* (University Politehnica of Bucharest, Romania)
*Mihai Dascălu* (University Politehnica of Bucharest, Romania)

- **IA-AI-1: Advanced Applications**
  Section Chairs: *Răzvan Rughiniş* (University Politehnica of Bucharest, Romania)
  *Mihai Dascălu* (University Politehnica of Bucharest, Romania)

- **IA-AI-2: Case Studies**
  Section Chairs: *Cosima Rughiniş* (University of Bucharest, Romania)
  *Daniel Rosner* (University Politehnica of Bucharest, Romania)

**International Workshop on Artificial Intelligence in Medicine & Healthcare - AIMH-2023**

Workshop organizers:
*Adina Magda Florea* (University Politehnica of Bucharest, Romania)
*Irina Mocanu* (University Politehnica of Bucharest, Romania)

- **AIMH-1: Applications**
  Section Chairs: *Adina Magda Florea* (University Politehnica of Bucharest, Romania)
  *Alexandru Sorici* (University Politehnica of Bucharest, Romania)

- **AIMH-2: Modeling and Design**
  Section Chairs: *Irina Mocanu* (University Politehnica of Bucharest, Romania)
  *Raluca Didona Brehar* (Technical University of Cluj-Napoca, Romania)

**International Workshop on Advance Control in Smart Grid – ACSG-2023**

Workshop organizers:
*Sergiu Stelian Iliescu* (University Politehnica of Bucharest, Romania)
*Ioana Făgărăşan* (University Politehnica of Bucharest, Romania)
*Iulia Stamatescu* (University Politehnica of Bucharest, Romania)
*Nicoleta Arghira* (University Politehnica of Bucharest, Romania)

- **ACSG-1: Applications**
  Section Chairs: *Ioana Făgărăşan* (University Politehnica of Bucharest, Romania)
  *Sergiu Stelian Iliescu* (University Politehnica of Bucharest, Romania)

- **ACSG-2: Modeling and Design**
  Section Chairs: *Iulia Stamatescu* (University Politehnica of Bucharest, Romania)
  *Nicoleta Arghira* (University Politehnica of Bucharest, Romania)

**International Workshop on Smart Services for Edge and Cloud Computing – SSeCC-2023**

Workshop organizers:
*Cătălin Negru* (University Politehnica of Bucharest, Romania)
*Ciprian-Octavian Truică* (University Politehnica of Bucharest, Romania)
*Ionuț Petre* (ICI Bucharest, Romania)

**International Workshop on Cyber Security and Resilience of Large-Scale Distributed Systems - CSR-LSDS-2023**

Workshop organizers:
Bogdan-Costel Mocanu (University Politehnica of Bucharest, Romania)
Massimo Ficco (Università degli Studi di Salerno, Italy)
Salvatore D'Antonio (Parthenope University of Naples, Italy)
Florin Pop (University Politehnica of Bucharest, ICI Bucharest, Romania)

**International Workshop on Monitoring and EviDEnce-based Protocols, Applications and Platforms for Active Living and Aging - MEDEA-2023**

Workshop organizers:
*Carmen Cîrnu* (ICI Bucharest, Romania)
*Lidia Băjenaru* (University Politehnica of Bucharest, ICI Bucharest, Romania)
*Ciprian Dobre* (University Politehnica of Bucharest, ICI Bucharest, Romania)

**International Workshop on Trends in Computer Science and Engineering Education - CSE-Edu-2023**

Workshop organizers:
*Mariana Mocanu* (University Politehnica of Bucharest, Romania)
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## ORGANIZERS

CSCS24 International Conference is organized by:
- Romanian Society of Control Engineering and Technical Informatics (*SRAIT*)
- Faculty of Automatic Control and Computers, University *POLITEHNICA* of Bucharest

and technically supported by:

- IEEE Romania Section
- IEEE Romania Computational Intelligence Society
- IEEE Romania Computer Society
- IEEE Romania Control Systems Society
- IEEE Romania Robotics and Automation Society
- ARIA-Romanian Association for Artificial Intelligence

# CSCS23 TIMETABLE

**Tuesday**

| | |
|---|---|
| 09.30 – 13.30 | ACS 55 Anniversary – Official ceremony |
| 13.30 – 14.30 | Lunch Break |
| 14.30 – 18.00 | ACS 55 Anniversary – Industrial Workshop (Precis Hall) |
| 19.00 | Cocktail Party, COȘ (Casa Oamenilor de Știință) |

**Wednesday, May 24, 2023**

| | |
|---|---|
| 09.00 | Registration |
| 09.00 – 09.30 | Opening Ceremony |
| 09.30 – 10.30 | Invited Talk (*Sean McGuire*) |
| 10.30 – 11.00 | Coffee Break |
| 11.00 – 12.30 | Parallel sessions |
| 12.30 – 13.30 | Lunch Break |
| 13.30 – 14.30 | Invited Talk (*Dr. Marius Stan*) |
| 14.30 – 15.00 | Coffee Break |
| 15.00 – 16.30 | Parallel sessions |
| 16.30 – 18.00 | Parallel sessions |

**Thursday, May 25, 2023**

| | |
|---|---|
| 09.00 | Registration |
| 09.30 – 10.30 | Invited Talk (*Dr. Sergiu Dascălu*) |
| 10.30 – 11.00 | Coffee Break |
| 11.00 – 12.30 | Parallel sessions |
| 12.30 – 13.30 | Lunch Break |
| 13.30 – 14.30 | Invited Talk (*Dr. Ovidiu Daescu*) |
| 14.30 – 15.00 | Coffee Break |
| 15.00 – 16.30 | Parallel sessions |
| 16.30 – 18.00 | Parallel sessions |

**Friday, May 26, 2023**

| | |
|---|---|
| 09.00 | Registration |
| 09.00 – 10.30 | Parallel sessions |
| 10.30 – 11.00 | Coffee Break |
| 11.00 – 12.30 | Parallel sessions |
| 12.30 – 13.30 | Lunch Break |
| 13.30 | Round Table and Closing Ceremony |

**\*for conference rooms, see the table at the end of the Programme**

# Wednesday, May 24, 2023

**Invited Talk (Plenary Session), 09.30-10.30**
**Sean McGuire**, NVIDIA Higher Education & Research, Europe, Middle East and Africa
*Artificial Intelligence in Scientific Research*

**CSCS24-A1: Control System Design**
**Date: 24 May 2023, 11.00-12.30**
Session Chairs: *Bogdan Dumitrescu* (University Politehnica of Bucharest, Romania)
*Grigore Stamatescu* (University Politehnica of Bucharest, Romania)

Evolutionary Hyper-Heuristics for Improving Global Optimization Algorithms
*Alexandru Mănescu and Bogdan Dumitrescu*

Multi-Objective Decision Making System Based on Spatial - Temporal Logics
*Victor Ababii, Radu Melnic, Viorica Sudacevschi, Viorel Cărbune, Ana Turcan and Irina Cojuhari*

Analysis of Trajectory Optimization for Solving Tower of Hanoi Problem Using Industrial Manipulator
*Ahmed Iqdymat and Grigore Stamatescu*

Achievements Regarding the Optimal Control of Refinery Processes
*Cristian Pătrăscioiu, Cristina Popa and Marian Popescu*

**CSCS24-C1: Modern Distributed Systems**
**Date: 24 May 2023, 11.00-12.30**
Session Chairs: *Ciprian Dobre* (University Politehnica of Bucharest, Romania)
*Radu-Ioan Ciobanu* (University Politehnica of Bucharest, Romania)

Deploying Large Private Clouds for High Availatibily Services
*Sergiu Weisz, Vlad-Iulius Năstase, Maria-Elena Mihăilescu, Darius Mihai and Nicolae Ţăpuş*

Qualified Remote Signature Through a Hybrid Cloud Architecture
*Marius Marian, Adelin Cusman and Dragoş Ionică*

TSPeer - Trust Model for Spherical Peer-to-Peer Overlay Networks
*Alexandra-Elena Mocanu, Bogdan-Costel Mocanu, Gabriel-Cosmin Apostol, Cătălin Negru, Ionuţ Petre and Florin Pop*

Network Management Devices in an SDN Environment
*Diyar Jamal Hamad, Khirota Gorgees Yalda, Nicolae Tăpuş and Ibrahim Taner Okumus*

**MEDEA-2023**
**Date: 24 May 2023, 11.00-12.30**
Workshop Chairs: *Carmen Cîrnu* (ICI Bucharest, Romania)
*Lidia Băjenaru* (University Politehnica of Bucharest, ICI Bucharest, Romania)

A Multimodal Biometric System for the e-Health Applications Security
*Sorin Soviany, Cristina Gheorghe and Minodora Dumitrache*

Applications of Deep Learning Algorithms for Retinal Diseases Diagnosis Based on Optical Coherence Tomography Imaging
*Elena-Anca Paraschiv*

Delivering Improved Care through Remote Health Monitoring Systems by Using Microservices. Case Study: Fall Detection Encompassed into Connected Care
*Marilena Ianculescu, Adriana Alexandru, Ionut-Emanuel Giura and Ana-Mihaela Vasilevschi*

Satisfaction of Older Adults with Health Applications: vINCI Case Study
*Lidia Băjenaru, Alexandru Balog, Mihaela Tomescu and Rozeta Draghici*

Using Blockchain to Improve Data Management in the vINCI Platform
*Piotr Krawiec, Waldemar Latoszek, Jordi Mongay Batalla, Lidia Băjenaru and Ciprian Dobre*

**Invited Talk (Plenary Session), 13.30-14.30**
**Dr. Marius Stan**, Argonne National Laboratory, University of Chicago (retired)
Chicago, IL, USA
*Artificial Intelligence for Material Design and Real-Time Manufacturing Optimisation*

**CSCS24-A2: Advanced Control Strategies**
**Date: 24 May 2023, 15.00-16.30**
Session Chairs: *Valentin Sgârciu (University Politehnica of Bucharest, Romania),*
        *Ion Fiodorov* (Technical University of Moldova, Rep. of Moldova)

Hybrid Fuzzy-PID Controller with Auto-Tuning According to the Stability Degree of the System
*Ion Fiodorov, Nadejda Popovici, Irina Cojuhari, Dumitru Moraru and Bartolomeu Izvoreanu*

Experimental Study of Pressure Variation in a Constant Volume Enclosure
*Ioan-Alexandru Sgârciu, Alin-Alexandru Năstase and Valentin Sgârciu*

Ultrasonic and VCSEL Sensor Fusion for Distance Measurement in Parking Assistance
*Florin-Daniel Sandru, Vlad-Ilie Ungureanu and Ioan Silea*

Velocity Computation for Vehicle Trajectory Tracking: A Comparative Analysis of Performance and Efficiency
*Georgiana-Sînziana Pauca and Constantin Florin Căruntu*

**CSCS24-C2: Software Systems**
**Date: 24 May 2023, 15.00-16.30**
Session Chairs: *Nicolae Ţăpuş* (University Politehnica of Bucharest, Romania)
        *Costin Carabaş* (University Politehnica of Bucharest, Romania)

Analysis of Design Solutions for Autonomous Drones
*Radu Bogdan Nedelcu and Adina Magda Florea*

An Industry 4.0 Oriented Predictive Maintenance Solution Deployed in Real-World Automotive Manufacturing Facilities
*Andrei Nicolae, Camelia Burlacu, Andrei Stanciu, Adrian Korodi, Bogdan Poşa and Flavius Mihăilă*

Inertial Navigation for Motion Tracking in Android
*Iliuţă-Daniel Dogaru, Costin Carabaş and Nicolae Ţăpuş*

**CSCS-DS: Doctoral Symposium**
**Date: 24 May 2023, 15.00-18.00**
Symposium Chairs: *Bogdan Dumitrescu* (University Politehnica of Bucharest, Romania)
*Florin Pop* (University Politehnica of Bucharest, Romania)


Creating a Personality Leisure-time Model Using Genetic Algorithms, Behavioral Psychology, and a Happiness Dataset
*Ciprian-Ionuţ Nuţescu and Mariana Mocanu*

Modern Cyber Security Attacks, Detection Strategies, and Countermeasures Procedures
*Răzvan Stoleriu, Cătălin Negru and Dragoş Rădulescu*

Modeling Fake News Infectious Dsease Epidemics on Temporal Networks Using Anatomy of Online Networks: a Review
*Kristel Bozhiqi and Vassil Guliashki*

Front-Office Management of Service Operations with Robotic Process Automation
*Radu Florin Negoiţă and Theodor Borangiu*


**CSCS24-C3: Computational Intelligence**
**Date: 24 May 2023, 16.30-18.00**
Session Chairs: *Mihai Nan* (University Politehnica of Bucharest, Romania)
*David-Traian Iancu* (University Politehnica of Bucharest, Romania)

Automated Neural Network Design Using Genetic Algorithms
*Andy-Eduard Cătrună and David-Traian Iancu*

Trading Strategy Hyper-parameter Optimization Using Genetic Algorithm
*George-Antoniu Deac and David-Traian Iancu*

EEG Multi-Objective Feature Selection Using a Genetic Procedure with Hybrid Mutation Operator
*Corina Cîmpanu*

Network Fuzzing: State of the Art
*Radu-Alexandru Mantu, Mihai Chiroiu and Nicolae Ţăpuş*


**CSE-Edu-2023**
**Date: 24 May 2023, 16.30-18.00**
Workshop Chairs: *Mariana Mocanu* (University Politehnica of Bucharest, Romania)
*Elena Apostol* (University Politehnica of Bucharest, Romania)

A Case Study for Emerging Technologies and the Potential Applications of AR in Higher Education
*Alexandru Predescu, Diana-Andreea Arsene and Mariana Mocanu*

A Diagnosis of the Global Quality of Life
*Silvia Bălan, Alexandru-Ionuţ Mustaţă and Claudia Ifrim*

Evaluating the Usage of Text to 3D Scene Generation Methods in Game-Based Learning
*Alexandru Grădinaru, Mihnea Vrejoiu, Florica Moldoveanu and Maria-Anca Băluţoiu*

Teaching Big Data: Lessons Learned
*Claudia Ifrim, Bogdan-Costel Mocanu, Alexandru-Ionuţ Mustaţă, Cătălin Negru and Florin Pop*

# Thursday, May 25, 2023

**Invited Talk (Plenary Session), 09.30-10.30**
**Dr. Sergiu Dascălu**, Professor, Department of Computer Science and Engineering, University of Nevada, Reno, USA
*Brain Computer Interfaces: Progress, Promises & Challenges*

**CSCS24-A3: Control Applications**
**Date: 25 May 2023, 11.00-12.30**
Session Chairs: *Monica Drăgoicea* (University Politehnica of Bucharest, Romania)
          *Andreea Udrea (*University Politehnica of Bucharest, Romania*)*

Smart Digital-Twin Hub Concept for Rice Yield Prediction and Monitoring from Multivariate Time Series Data
*Yahjeb Bouha Khatraty, Nédra Mellouli, Mamadou Tourad Diallo and Mohamedade Farouk Nanne*

Enhanced Cyber-Physical System with Semantic Technologies and Machine Learning to Support Smart Farming
*Sorin N. Ciolofan, Monica Drăgoicea and Daniel-Cătălin Popeangă*

Pneumonia Detection from X-ray Images Using Convolutional Neural Networks
*Viorel Dediu and Andreea Udrea*

**CSCS24-C4: Applications**
**Date: 25 May 2023, 11.00-12.30**
Session Chairs: *Mariana Mocanu* (University Politehnica of Bucharest, Romania)
          *Nirvana Popescu* (University Politehnica of Bucharest, Romania)

Making Children Read More and Better by Integrating Natural Language Processing and Gamification Techniques into Mobile Applications
*George Cătălin Voicu, Sorin N. Ciolofan and Monica Drăgoicea*

Order from Chaos: Leveraging the Order in Time as Intrinsic Reward
*Andrei-Cristian Nica and Adina Magda Florea*

Pneumonia Detection Using Federated Learning
*Camelia-Raluca Farkaş, Radu-Ioan Ciobanu and Ciprian Dobre*

Quizzing the Quizzes: Improving Cancer Risk Factor Analysis Tools
*Jared Vlach, Sergiu Dascalu, Yantao Shen and Jeongwon Park*

**IAFA-1: Fractal Approaches in Medicine and Health**
**Date: 25 May 2023, 11.00-12.30**
Section Chairs: *Dan Popescu* (University Politehnica of Bucharest, Romania)
          *Loretta Ichim* (University Politehnica of Bucharest, Romania)

Review of Metaheuristic Algorithms in Feature Selection Based on Parkinson Disease
*Edjola Naka*

The Fibonacci Constant, the Wasserstein Distance, and Biological Tumor Aggressiveness in Prostate Cancer
*Waliszewski Przemyslaw*

Classification of Skin Lesions from Dermatoscopic Images Using Convolutional Neural Networks
*Maria Oniga, Alina-Elena Sultana, Dan Popescu, Daniel-Marian Merezeanu and Loretta Ichim*

Morphological Changes in Normal, Premalignant and Malignant Oropharyngeal Epithelial Tissues
*Prarthna Clare and Rasha Abu-Eid*

A Predictive Framework for Efficient Resources Allocation in Healthcare Organisations
*Gabriela Coman, Ştefan Mocanu and Radu Dobrescu*


**Invited Talk (Plenary Session), 13.30-14.30**
**Dr. Ovidiu Dăescu,** Professor and Department Head, Jonsson School Endowed Chair, University of Texas at Dallas, USA
*Knowledge First and Data First Automated Decision Support*


**CSCS24-C5: Security**
**Date: 25 May 2023, 15.00-16.30**
Session Chairs: *Răzvan Rughiniş* (University Politehnica of Bucharest, Romania)
          *Dumitru-Cristian Trancă* (University Politehnica of Bucharest, Romania)

DetNetAuth: Efficient Authentication and Integrity Protection for Deterministic Networking
*Daniel-Florin Dosaru and Nicolae Ţăpuş*

Lightweight Cryptographic Secure Random Number Generator for IoT Devices
*Florin Rastoceanu, Răzvan Rughiniş and Dumitru-Cristian Trancă*

Effective Solutions to Prevent Digital Fraud by Introducing Electronic Signature of PDF Files
*Ionuţ Petrişor Anghel, Dragoş Rădulescu and Ion Alexandru Marinescu*


**IAFA-2: Fractals and Complexity**
**Date: 25 May 2023, 15.00-16.30**
Section Chairs: *Sei-Ichi Tsujimura* (Nagoya City University, Japan)
          *Radu Dobrescu* (University Politehnica of Bucharest, Romania)

Intrinsic Phase Difference Between Cone and Melanopsin Signals in the Pupillary Pathway
*Sei-ichi Tsujimura, Akiko Matsumoto and Wakayo Yamashita*

Using Fractal Techniques for Evaluation of Qualia in the Brain
*Ionela Mirela Rîciu and Radu Dobrescu*

Facing Complexity Derived from Digital Transformation of Public Administration
*Ana-Maria Popa, Corina Dima and Magdalena Anghel*

A Survey on Optimization Methods in Business Information Systems
*Alsa Nuzi and Vassil Guliashki*

Fractal Encoding Uses and Variations in Contemporary Biometrics Applications
*Carmen Bisogni, Aniello Castiglione, Fabio Narducci and Chiara Pero*

**AIMH-1: Applications**
**Date: 25 May 2023, 15.00-16.30**
Section Chairs: *Adina Magda Florea* (University Politehnica of Bucharest, Romania)
*Alexandru Sorici* (University Politehnica of Bucharest, Romania)

Age-Related Macular Degeneration Biomarker Segmentation from OCT Images
*Raluca Didona Brehar, Adrian Groza, Ioana Damian, George Muntean and Simona Delia Nicoară*

An Intelligent Ecosystem for Improving Brain Disease Monitoring of Patients Using Wearable Devices and Artificial Intelligence
*Alexandru Sorici, Lidia Băjenaru, Irina Mocanu and Adina Magda Florea*

An Intelligent Application for Improving Health Conditions Through Gamification
*Irina Mocanu, Oana Cramariuc and Ionuț Dorin Stanciu*

Techniques of Biological Signals Classification and Comparisons Using Machine Learning Techniques
*Marina Ciocîrlan and Andreea Udrea*

**IAFA-3: Fractals in Industry**
**Date: 25 May 2023, 16.30-18.00**
Section Chairs: *Ştefan Mocanu* (University Politehnica of Bucharest, Romania)
*Nicoleta Angelescu* (Valahia University of Târgoviște, Romania)

Enhancing the Detection of Fraudulent Activities in the Distribution of Energy Through Data Mining Algorithms
*Silviu Gresoi, Ştefan Mocanu, Ioana Făgărăşan and Grigore Stamatescu*

Guaranteeing Services in MPLS Virtual Networks – the Case of File Transfer Type Traffic
*Cristian Stănescu, Gabriel Preduşcă, Nicoleta Angelescu, Liana Denisa Cîrciumărescu and Dan Constantin Puchianu*

Fractal Smart Grids - A New Challenge for Power Systems Operation
*Teodora Iuliana Mindra*

IoT Intrusion Detection: A Machine Learning Assessment
*Robert-Alexandru Crăciun, Radu Nicolae Pietraru, Ştefan Alexandru Mocanu and Mihnea Alexandru Moisescu*

Enhancing Neural Network with LIDAR Data for Navigation
*Diana Baicu, Mihai Crăciunescu, Thomas Duvinage and Ştefan Alexandru Mocanu*

**AIMH-2: Modeling and Design**
**Date: 25 May 2023, 16.30-18.00**
Section Chairs: *Irina Mocanu* (University Politehnica of Bucharest, Romania)
*Raluca Didona Brehar* (Technical University of Cluj-Napoca, Romania)

Enhanced Design and Functionalities for the Virtual Patient Educational Platform
*Imad Alex Awada, Alexandru Sorici, Adina Magda Florea and Alexandru Scafa-Udrişte*

Experiments with Semi-Supervised Learning: from Cityscapes to Medical Images
*Ana-Maria Simion and Şerban Radu*

Home Care Assistance Solution Based on a Software Multi-Agents System
*Mohammad Rasras, Iuliana Marin and Şerban Radu*

**ENV-2023**
**Date: 25 May 2023, 16.30-18.00**
Workshop Chairs: *Costică Nitu* (University Politehnica of Bucharest, Romania)
  *Alexandru Dumitraşcu* (University Politehnica of Bucharest, Romania)

Performance Analysis for CRUD Operations in Relational Databases from Java Programs Using Hibernate
*Alexandru-Marius Bonteanu, Cătălin Tudose and Ana Magdalena Anghel*

Radar and Fuzzy Systems Technologies for Monitoring and Management of Vehicle Traffic and Pedestrian Flow
*Eusebiu Pruteanu, Costică Nitu and Petru Puiu*

Distributed Monitoring and Control System of Gas Concentrations in Different Environment
*Iulian Furdu, Eusebiu Pruteanu and Costică Nitu*

Greenhouse Monitoring System Based on PLC and Wireless Sensors
*Alexandru Dumitraşcu*


# Friday, May 26, 2023

**IWoCPS-1: Design of Cyber-Physical Systems**
**Date: 26 May 2023, 09.00-10.30**
Section Chairs: *Ioan Dumitrache* (University Politehnica of Bucharest, Romania)
  *Ioan Sacală* (University Politehnica of Bucharest, Romania)

Analysis of Viewpoints for Modeling Cyber-Physical Systems
*Anca Daniela Ioniţă, Johannes Meier, Christian Schönberg and Andreas Winter*

Integrating Blockchain Technology in a Cyber Physical System to Secure Data
*Beatrix-May Balaban, Ioan Ştefan Sacală, Alina-Claudia Petrescu-Niţă and Răzvan Niţă*

A Cyber-Physical Systems Vision of Power Systems
*Ioan Dumitrache, Simona Iuliana Caramihai and Delia Dogaru*

Autonomous Mobile Navigation Robots in Unknown Environments Using the HQ Stereo Cameras and the RPLIDAR Sensors to Increase the Recognition Accuracy
*Alexandra Cătălina Ciocîrlan, Marius Pandelea, Victor Vlădăreanu, Mihai Rădulescu, Ştefan Ghibanu, Ionel Puşcaşu and Luige Vlădăreanu*

Learning Control Laws in Simulated Environments for Motion Gestures of Humanoid Robots
*Andrei Mateescu, Ioana-Livia Ştefan, Dragoş Constantin Popescu, Ioan Ştefan Sacală and Silviu Răileanu*

Interoperability Framework for Cyber-Physical Systems Based Capabilities
*Eugen Pop, Miruna-Elena Iliuţă, Nicolae Constantin, Daniela Gîfu and Alexandru Dumitraşcu*


**IA-AI-1: Advanced Applications**
**Date: 26 May 2023, 09.00-10.30**
Section Chairs: *Răzvan Rughiniş* (University Politehnica of Bucharest, Romania)
  *Mihai Dascălu* (University Politehnica of Bucharest, Romania)

The Emerging Social Status of Generative AI: Vocabularies of AI Competence in Public Discourse
*Emanuela Bran, Cosima Rughiniş, Gheorghe Nadoleanu and Michael G. Flaherty*

How Capable are State-of-the-art Language Models to Cope with Sarcasm?
*Alexandru – Costin Băroiu and Ştefan Trăuşan - Matu*

Garbage in, Garbage out: An Analysis of HTML Text Extractors and Eheir Impact on NLP Performance
*Vlad Dumitru, Denis Iorga, Ştefan Ruseti and Mihai Dascălu*

The Moral Status of Artificial Intelligence: Exploring Users' Anticipatory Ethics in the Controversy Regarding LaMDA's Sentience
*Dragoş Obreja and Răzvan Rughiniş*

## ACSG-1: Applications
**Date: 26 May 2023, 09.00-10.30**
Section Chairs: *Ioana Făgărăşan* (University Politehnica of Bucharest, Romania)
*Sergiu Stelian Iliescu* (University Politehnica of Bucharest, Romania)

Analysis of Anomalies in Fraud Detection for Smart and Non-smart Grids
*Silviu Gresoi, Ioana Făgărăşan, Ştefan Alexandru Mocanu and Grigore Stamatescu*

Control Requirements and Efficiency Evaluation for PV Power Plants– a Practical Aproach
*Cristian Andronic, Ioana Făgărăşan, Nicoleta Arghira and Sergiu Stelian Iliescu*

Decision System for Ensuring Thermal Comfort of Occupants in a Smart Building
*Mihaela-Gabriela Boicu, Grigore Stamatescu, Cosmin-Florin Fudulu, Marius-Alexandru Dobrea, Mihaela Vasluianu and Giorgian Neculoiu*

Energy Efficient IoT Air Quality Monitoring System
*Silvian-Marian Petrică, Ioana Făgărăşan, Nicoleta Arghira, Iulia Stamatescu, Giorgian Neculoiu and Oana Flangea*

## SSeCC-2023
**Date: 26 May 2023, 09.00-10.30**
Workshop Chairs: *Ionuţ Petre* (ICI Bucharest, Romania)
*Ciprian-Octavian Truică* (University Politehnica of Bucharest, Romania)

IoT Sensors' Characteristics Used for Behavior Profiling
*Alin Zamfiroiu, Radu Boncea and Ionuţ Petre*

Pose Orientation Analysis for Fall Detection Using Non-invasive Technologies
*Răzvan-Alexandru Duţescu and Mihai Apostol*

Using Spatial Indexing Systems to Optimize Emergency Response Routes
*Francis Patrick Diallo, Mihai Alexandru Preda, Alexandru-Ionuţ Mustaţă and Bogdan-Costel Mocanu*

Virtual Worlds, Real Technologies: an Insight Into Metaverse and its Principles
*Ionuţ Petre, Dragos Iordache, Mădălina Zamfir, Monica Barbu, Răzvan Duţescu and Ion Alexandru Marinescu*

## IWoCPS-2: Applications of Cyber-Physical Systems
**Date: 26 May 2023, 11.00-12.30**
Section Chairs: *Mihnea Moisescu* (University Politehnica of Bucharest, Romania)
*Alexandra Cernian* (University Politehnica of Bucharest, Romania)

A Digital Twin Based Approach in Healthcare
*Miruna-Elena Iliuţă, Eugen Pop, Mihnea Alexandru Moisescu, Simona Iuliana Caramihai and Bogdan Ţigănoaia*

Supporting Mass Collaborative Learning Communities Through Digital Innovation Hubs
*Majid Zamiri, Joao Sarraipa, Elsa Marcelino-Jesus and Ricardo Jardim-Goncalves*

Smart Citizen in a Smart Building in Society 5.0
*Răzvan Roşu*

Quantum Computing Applications and Impact for Cyber Physical Systems
*Alin Iftemi, Alexandra Cernian and Mihnea Alexandru Moisescu*

Efficient Training Models of Spiking Neural Networks Deployed on a Neuromorphic Computing Architectures
*Laura Căpăţînă, Alexandra Cernian and Mihnea Alexandru Moisescu*


**IA-AI-2: Case Studies**
**Date: 26 May 2023, 11.00-12.30**
Section Chairs: *Cosima Rughiniş* (University of Bucharest, Romania)
                   *Daniel Rosner* (University Politehnica of Bucharest, Romania)

What is the Price of Your Used Car? Automated Predictions Using XGBoost and Neural Networks
*Andreea Dutulescu, Mihai Iamandei, Laurenţiu-Marian Neagu, Ştefan Ruseti, Vladimir Ghiţă and Mihai Dascălu*

Idealized Self-Presentation Through AI Avatars. A Case Study of Lensa AI
*Diana A. Moga and Cosima Rughiniş*

Candidate Engagement Success Prediction Using Machine Learning and Natural Language Processing Techniques
*Emiliano Mankolli and Senada Bushati*

European Perceptions of Artificial Intelligence and Their Social Variability. An Exploratory Study
*Andrea-Mariana Budeanu, Dinu Turcanu and Daniel Rosner*


**ACSG-2: Modeling and Design**
**Date: 26 May 2023, 11.00-12.30**
Section Chairs: *Iulia Stamatescu* (University Politehnica of Bucharest, Romania)
                   *Nicoleta Arghira* (University Politehnica of Bucharest, Romania)

Energy-Independent Solution Using a Medium-Power Wind Turbine to Ensure the Irrigation Deficit in an Isolated Agricultural Areal
*Cosmin Florin Fudulu, Ioana Făgărăşan, Mihaela-Gabriela Boicu, Mihaela Vasluianu, Marius-Alexandru Dobrea and Giorgian Neculoiu*

Markov Chain Model for Energy Community Member Reaction to Recommendations: a multi-Agent Case Study
*Mircea Ştefan Simoiu, Ioana Făgărăşan, Stephane Ploix, Vasile Calofir and Sergiu Stelian Iliescu*

Reducing the Energy Consumption Required for the Disassembly Process Implemented on an Assembly and Disassembly Line
*Marius-Adrian Paun, Otilia Elena Dragomir, Florin Dragomir, Sergiu Stelian Iliescu, Eugenia Minca, Octavian Gabriel Duca and Ion Valentin Gurgu*

**CSR-LSDS-2023**
**Date: 26 May 2023, 11.00-12.30**
Workshop Chairs: *Bogdan-Costel Mocanu* (University Politehnica of Bucharest, Romania)
                 *Cătălin Negru* (University Politehnica of Bucharest, Romania)

A Broad Analysis of Map Routing Applications
*Andreea-Cristina Rădăcină, Mihai-Bogdan Geamănu, Alexandru-Ionuţ Mustaţă and Cătălin Negru*

Fuzzing Virtual Machine Monitors for Improved Security
*Delia-Maria Pavel, Andreea Florescu, Costin Carabaş and Nicolae Ţăpuş*

On the (in)Security and Weaknesses of Commonly Used Applications on Large-Scale Distributed Systems
*Andrea Francesco Abate, Aniello Castiglione, Lucia Cimmino, Davide De Angelis, Sara Flauto and Alberto Volpe*

Privacy Risk Analysis and Metrics in Capturing and Storing Network Traffic
*Michele Mastroianni, Francesco Palmieri, Massimo Ficco, Rafal Kozik and Michal Choras*

**Round Table and Closing Ceremony**
**Date: 26 May 2023, 13.30**

## GENERAL INFORMATION

## MAIL

Correspondence in connection to the CSCS24 Conference should be addressed as it follows:
    CSCS24 - SRAIT
    University "POLITEHNICA" of Bucharest
    Faculty of Automatic Control and Computers
    313 Spl. Independenței, Sector 6
    77206 Bucharest, Romania
    Phone: +(40) 21 402 91 67
    Fax: +(40) 21 402 95 87
    E-mail: cscs24@easychair.org

## WORKING LANGUAGE
The working language of CSCS24 is English and will be used for presentations and discussions.

# International Conference on
# Control Systems and Computer Science - CSCS24
# May 24-26, 2023

| Tuesday May 23, 2023 | | Wednesday May 24, 2023 | | | | | Thursday May 25, 2023 | | | | | Friday May 26, 2023 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Registration** | 9.00-9.30 | **Opening Ceremony & Registration (PR105)** | | | | | **Registration** | | | | | **Registration** | | | |
| **ACS 55 Anniversary**<br><br>Official ceremony (PR001) | 09.30-10.30 | **Invited Talk (PR105)** Artificial Intelligence in Scientific Research **Sean McGuire** | | | 09.30-10.30 | | **Invited Talk (PR105)** Brain Computer Interfaces: Progress, Promises & Challenges **Dr. Sergiu Dascalu** | | | 09.00-10.30 | | **IWoCPS-1** Workshop (PR105) | **IA-AI-1** Workshop (PR106) | **ACSG-1** Workshop (PR107) | **SSeCC** Workshop (PR607) |
| | 10.30-11.00 | **Coffee Break** | | | 10.30-11.00 | | **Coffee Break** | | | 10.30-11.00 | | **Coffee Break** | | | |
| | 11.00-12.30 | **MEDEA** Workshop (PR105) | **CSCS-C1** Main track (PR106) | **CSCS-A1** Main track (PR107) | 11.00-12.30 | | **CSCS-A3** Main track (PR105) | **CSCS-C4** Main track (PR107) | **IAFA-1** Workshop (PR403) | 11.00-12.30 | | **IWoCPS-2** Workshop (PR105) | **IA-AI-2** Workshop (PR106) | **ACSG-2** Workshop (PR107) | **CSR-LSDS** Workshop (PR607) |
| | 12.30-13.30 | **Lunch Break** | | | 12.30-13.30 | | **Lunch Break** | | | 12.30-13.30 | | **Lunch Break** | | | |
| **Lunch Break** | 13.30-14.30 | **Invited Talk (PR105)** Artificial Intelligence for Material Design and Real-Time Manufacturing Optimisation **Dr. Marius Stan** | | | 13.30-14.30 | | **Invited Talk (PR105)** Knowledge First and Data First Automated Decision Support **Dr. Ovidiu Daescu** | | | 13.30 | | **Round Table Closing Ceremony and Coffee (PR105)** | | | |
| **ACS 55 Anniversary**<br><br>Industrial Workshop<br><br>(PR Hall) | 14.30-15.00 | **Coffee Break** | | | 14.30-15.00 | | **Coffee Break** | | | | | | | | |
| | 15.00-16.30 | **CSCS-DS** Doctoral Symposium (PR105) | **CSCS-C2** Main track (PR106) | **CSCS-A2** Main track (PR107) | 15.00-16.30 | | **AIMH-1** Workshop (PR105) | **CSCS-C5** Main track (PR107) | **IAFA-2** Workshop (PR403) | | | | | | |
| | 16.30-18.00 | **CSCS-DS** Doctoral Symposium (PR105) | **CSCS-C3** Main track (PR106) | **CSE-EDU** Workshop (PR107) | 16.30-18.00 | | **AIMH-2** Workshop (PR105) | **ENV** Workshop (PR107) | **IAFA-3** Workshop (PR403) | | | | | | |

All rooms are in **PRECIS building**, *University Politehnica of Bucharest*, Iuliu Maniu Boulevard 6D, Bucharest 061344, Romania
**Tuesday, May 23, 2023, 19:00, Cocktail Party at COȘ** (Casa Oamenilor de Știință) - Lahovari Square, no. 9, sector 1, Bucharest