# 1ST DOCTORAL SYMPOSIUM ON ELECTRONICS, TELECOMMUNICATIONS, AND INFORMATION TECHNOLOGY

October 4-6, Bucharest, 2023



Faculty of Electronics, Telecommunications, and Information Technology,

National University of Sciences and Technologies Politehnica Bucharest

# Contents

The 2023 Doctoral Symposium on Electronics, Telecommunications, and Information Technology (SD-ETTI 2023) will provide PhD students working in all areas of electronics, telecommunications, and information technology with a unique opportunity to share their mature or ongoing research work and ideas and get suggestions and feedback from renowned and experienced researchers in the field. This would allow the authors to extend their work after the symposium based on the feedback received and target top tier journal publications. The venue will also be a networking event allowing them to get in contact with the relevant industry.

The main topics of the conference comprise, but are not limited to, contributions of electronics, telecommunications, and information technology in: Devices, Circuits and Sensors, Autonomous Robots, Power Electronics, Medical Electronics, Analog and Digital Integrated Circuits, Optoelectronics, Internet of Things, Smart Cities, and Internet of Everything, Advanced Mobile Technologies and 5G/6G and Beyond Networks, Satellites, Space Communications, UAVs, Security and Privacy of Information, Systems and Networks, Artificial Intelligence, Cognitive Systems, Machine Learning, Image, Video, Speech, Language, Multimedia, Biomedical - Processing and Systems, Computer Vision, Information Retrieval, Data Warehouses, Data Mining, and much more.

The SD-ETTI 2023 symposium is organized by the Faculty of Electronics, Telecommunications, and Information Technology, within National University of Sciences and Technologies Politehnica Bucharest, in Bucharest, Romania. The conference will include mandatory oral paper presentations and will additionally provide the option for those interested to present their work in the form of posters.

## Organizing committee

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# Program Overview

| time | 4 October | 5 October | 6 October |
|---|---|---|---|
| 9:00–9:30 | Registration | | |
| 9:30–10:00 | Opening | | |
| 10:00–10:30 | Oral session 1 (5 papers) | Oral session 4 (5 papers) | Oral session 7 (5 papers) |
| 11:30–12:00 | Coffee break | | |
| 12:00–13:30 | Vodafone Innovation Hub | Posters & industry session | Oral session 8 (5 papers) |
| 13:30–15:00 | Lunch | | |
| 15:00–16:30 | Oral session 2 (5 papers) | Oral session 5 (5 papers) | Oral session 9 (5 papers) |
| 16:30–17:00 | Coffee break | | |
| 17:00–18:30 | Oral session 3 (5 papers) | Oral session 6 (5 papers) | Oral session 10 (5 papers) |
| 18:30–19:00 | | Group photo | |

## Wednesday, 4 October

9:00–9:30

**Registration (30 minutes)**   **ETTI Hall, A building, 1st Floor**

9:30–10:00

**Opening (30 minutes)**   **A101 room, A building, 1st Floor**

10:00–11:30

**Oral session 1 (5 x 18 minutes)**   *Session chair: Alina-Elena MARCU*   **A101 room, A building, 1st Floor**

1. "A Comparative Analysis of Feature Extraction Algorithms for Analog/Mixed Verification Signals",
   *Andrei Gaita* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

2. "Study on metamodel-based Design of Experiments for MOSFET modelling",
   *Georgian Nicolae* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

3. "Intrusive application detection using Weka classifiers",
   *Maria-Mădălina Andronache* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

4. "Automatic methods for audio signal processing",
   *Marian Negru* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

5. "Parametric models for discovering anomalous ships",
   *Alexandru Pohontu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Robert Gheorghe (Maritime University of Constanța, Romania), Laura Nedelcu ("Dunarea de Jos" University of Galați, Romania) (virtual)

11:30–12:00

**Coffee Break**   **ETTI Hall, A building, 1st Floor**

12:00–13:30

**Vodafone Innovation Hub**   **Vodafone Innovation Hub laboratory, A building, 1st Floor**

Laboratory visit

13:30–15:00

**Lunch**  <span style="color:red">ETTI Canteen</span>

15:00–16:30

**Oral session 2 (5 x 18 minutes)**   *Session chair: Mihai DOGARIU*   <span style="color:red">A101 room, A building, 1<sup>st</sup> Floor</span>

  6.  "EEG classification for emotion recognition",
      *Cristina Andronache* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

  7.  "Communications' safety beyond security protocols",
      *Alexandru-Madalin Vizitiu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Lidia Dobrescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan-Catalin Trip (The Special Telecommunications Service, Romania), Vlad-Florian Butnariu (The Special Telecommunications Service, Romania) (virtual)

  8.  "BLDC PSPICE MOTOR LOAD",
      *Laura A. Gheorghe* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Lidia Dobrescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Dragos Dobrescu (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

  9.  "Traffic analysis using machine learning algorithms",
      *Alin Alexandru Șerban* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

  10. "A Collection of Still Images for Coherent Crowd Analysis",
      *Andrei - Cosmin Jitaru* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

16:30–17:00

**Coffee Break**   <span style="color:red">ETTI Hall, A building, 1<sup>st</sup> Floor</span>

17:00–18:30

**Oral session 3 (5 x 18 minutes)**   *Session chair: Ioana MARCU*   <span style="color:red">A101 room, A building, 1<sup>st</sup> Floor</span>

  11. "UAV Detection and Defense Systems",
      *Cosmin Paleacu* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

  12. "Synthetic Colorectal Cancer Histopathology Image Augmentation Using Conditional Generative Adversarial Networks",
      *Alexandra-Georgiana Andrei* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mara Graziani (University of Applied Sciences of Western Switzerland

HES-SO Valais, Switzerland), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Henning Müller (University of Applied Sciences of Western Switzerland HES-SO Valais, Switzerland)

13. "Deepfake Detection: Generalizing our Way to Success",
    *Dan-Cristian Stanciu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

14. "Comparative analysis of 3D pose methods for snowboarding",
    *Cristian Alexandru Tănase* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Ana-Maria Claudia Drăgulinescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

15. "Customer Churn predictions using different algorithms in the telecommunications industry",
    *Anamaria Dumitrescu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

# Thursday, 5 October

9:00–9:30

**Registration (30 minutes)**   <span style="color:red">ETTI Hall, A building, 1st Floor</span>

9:30–10:00

**Opening (30 minutes)**   <span style="color:red">A101 room, A building, 1st Floor</span>

10:00–11:30

**Oral session 4 (5 x 18 minutes)**   *Session chair: Octavian RADU*   <span style="color:red">A101 room, A building, 1st Floor</span>

1. "Comparative Analysis of Logistic Regression and SVM Models for Drowsiness Detection in Drivers",
   *Sama Hussein Al-Gburi* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

2. "An Evaluation of the functionality of NB-IoT for smart metering applications",
   *Kanar A. Al-Sammak* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

3. "The Influence of Safety Requirements on the Development of Automotive Sensor Interfaces",
   *Nicolae Ioan Gross* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Paul Svasta (National University of Sciences and Technologies Politehnica Bucharest, Romania)

4. "Optimization of a TinyML V-CNN architecture for street number recognition using random search",
   *Adrian D. Mirică* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Radu Dogaru (National University of Sciences and Technologies Politehnica Bucharest, Romania), Ioana Dogaru (National University of Sciences and Technologies Politehnica Bucharest, Romania)

5. "Sparse Reconstruction for High-Resolution Inverse SAR Imaging",
   *Muhammad Amjad Iqbal* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Miguel Heredia Conde (University of Siegen, Germany), Andrei Anghel (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mihai Datcu (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

11:30–12:00

**Coffee Break**   <span style="color:red">ETTI Hall, A building, 1st Floor</span>

12:00–13:30

**Posters & industry session**   <span style="color:red">ETTI Hall, A building, 1st Floor</span>

1. "UAV Detection and Defense Systems",
   *Cosmin Paleacu* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

2. "Comparative Analysis of Logistic Regression and SVM Models for Drowsiness Detection in Drivers",
   *Sama Hussein Al-Gburi* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

3. "An Evaluation of the functionality of NB-IoT for smart metering applications",
   *Kanar A. Al-Sammak* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

13:30–15:00

**Lunch**   **ETTI Canteen**

15:00–16:30

**Oral session 5 (5 x 18 minutes)**   *Session chair: Alexandra ANDREI*   **A101 room, A building, 1ˢᵗ Floor**

6. "Decision Fusion of Two Asymmetric Trained CNN Classifiers to Detect COVID-19 in Chest X-ray Imaging: Dempster-Shafer versus Net Maximization",
   *Gabriela-Loredana Ghenea* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Victor-Emil Neagoe (National University of Sciences and Technologies Politehnica Bucharest, Romania)

7. "A Swarm Intelligence Approach to Improve CNN Classifier Accuracy for Hyperspectral EO Imagery: Bat Algorithm (BA) versus Ant Colony Optimization (ACO)",
   *Liviu Rujan* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Victor-Emil Neagoe (National University of Sciences and Technologies Politehnica Bucharest, Romania)

8. "Depth Estimation on iDFD: Evaluating the Performance of State of the Art Techniques",
   *Saqib Nazir* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Daniela Coltuc (National University of Sciences and Technologies Politehnica Bucharest, Romania)

9. "Complex-Valued Deep Architectures for Synthetic Aperture Radar (SAR) Data",
   *Reza Mohammadi Asiyabi* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mihai Datcu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Andrei Anghel (National University of Sciences and Technologies Politehnica Bucharest, Romania)

10. "Compressive Learning on SAR data",
    *Mobina Keymasi* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Omid Ghozatlou (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mihai Datcu (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

16:30–17:00

**Coffee Break** <span style="color:red">**ETTI Hall, A building, 1st Floor**</span>

17:00–18:30

**Oral session 6 (5 x 18 minutes)** *Session chair: Andrei JITARU* <span style="color:red">**A101 room, A building, 1st Floor**</span>

11. "Advances in Photoplethysmography Signal Processing for Blood Hypertension Management",
    *Evdochim Lucian* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Dragos Dobrescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Stela Halichidis (Ovidius University of Constanta, Romania), Lidia Dobrescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Slivliu Stanciu (Dr. Carol Davila Central Military Emergency University Hospital, Romania)

12. "Large Margin Learning for Better Retrieval Deep Embeddings",
    *Andrei Racoviteanu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Corneliu Florea (National University of Sciences and Technologies Politehnica Bucharest, Romania)

13. "Stereophonic Acoustic Echo Cancellation Adaptive Algorithms using Line Search Methods",
    *Ionuț-Dorinel Fîciu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Cristian-Lucian Stanciu (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

14. "Predictive Resource Allocation in 5G Network Slicing: Leveraging SARIMAX Time Series Models with AI",
    *Larisa Mihaela Tufeanu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Marius-Constantin Vochin (National University of Sciences and Technologies Politehnica Bucharest, Romania), Constantin-Laurentiu Paraschiv (National University of Sciences and Technologies Politehnica Bucharest, Romania)

15. "Automating Network Slices in Open Source MANO",
    *Cosmin Conțu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Eugen Borcoci (National University of Sciences and Technologies Politehnica Bucharest, Romania), Marius-Constantin Vochin (National University of Sciences and Technologies Politehnica Bucharest, Romania), Frank Y. Li (University of Agder, Norway) (virtual)

18:30–19:00

**Group photo** <span style="color:red">**ETTI Hall, A building, 1st Floor**</span>

# Friday, 6 October

9:00–9:30

**Registration (30 minutes)**   ETTI Hall, A building, 1<sup>st</sup> Floor

9:30–10:00

**Opening (30 minutes)**   A101 room, A building, 1<sup>st</sup> Floor

10:00–11:30

**Oral session 7 (5 x 18 minutes)**   *Session chair: Ana-Maria DRĂGULINESCU*   A101 room, A building, 1<sup>st</sup> Floor

1. "Industry 5.0 as a human-friendly version of Industry 4.0",
   *Marius Constantin Marica* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Nicu Bizon (The National University of Science and Technology PO-LITEHNICA Bucharest, Pitești University Centre), Ionel Bostan (The National University of Science and Technology POLITEHNICA Bucharest, Pitești University Centre)

2. "A brief review of the methods for identify faults in photovoltaic panels",
   *Nicolae-Cătălin FRÎNCU* (The National University of Sciences and Technologies Politehnica Bucharest, Romania)

3. "Optimising Charging Scheduling for Electrical Vehicles",
   *Husam M. Al-Alwash* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Eugen Borcoci (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

4. "Personalized Automatic Mixing System",
   *Bogdan Moroșanu* (National University of Sciences and Technologies Politehnica Bucharest, Romania)

5. "An introduction to 5G security concerns",
   *Alina Florina Glavan* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Victor Croitoru (National University of Sciences and Technologies Politehnica Bucharest, Romania)

11:30–12:00

**Coffee Break**   ETTI Hall, A building, 1<sup>st</sup> Floor

12:00–13:30

**Oral session 8 (5 x 18 minutes)**   *Session chair: Alina SULTANA*   A101 room, A building, 1<sup>st</sup> Floor

6. "A New Conversion Interface For File Compatibility In The Moodle e-Learning Platform",
   *Vasile Baneș* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Cristian Ravariu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

7. "The State of Health Lithium Ion Cells Used in Electric Vehicles",
*Radu-Petru Fotescu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Loredana-Maria Fotescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Rodica-Claudia Constantinescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Paul Svasta (National University of Sciences and Technologies Politehnica Bucharest, Romania)

8. "Electronic Systems Used in the Domain of Traceability",
*Loredana-Maria Fotescu (Burciu)* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Radu-Petru Fotescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Rodica-Claudia Constantinescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Paul Svasta (National University of Sciences and Technologies Politehnica Bucharest, Romania)

9. "Neural networks and the emergence of learning",
*Lucian Gruia* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Alina-Elena Marcu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania), Adrian Popescu (CEA LIST, Franta)

10. "Study on the state of research in the field of "fake-news" detection using machine learning techniques",
*Alexandru Ciobanu* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Bogdan Ionescu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

13:30–15:00

**Lunch**  **ETTI Canteen**

15:00–16:30

**Oral session 9 (5 x 18 minutes)**  *Session chair: Alexandru MARȚIAN*  **A101 room, A building, 1st Floor**

11. "Innovations in Wearable Antenna Design: Experimental Findings and Measurement Techniques",
*Călin Mircea* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Paul Svasta (National University of Sciences and Technologies Politehnica Bucharest, Romania)

12. "Thermal Diffusivity a Powerful Tool for Thermal Management of Electronic Components",
*Corina Mitulescu (Săndulescu)* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Ioan Plotog (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mihai Brânzei (National University of Sciences and Technologies Politehnica Bucharest, Romania), Paul Svasta (National University of Sciences and Technologies Politehnica Bucharest, Romania)

13. "Underwater acoustic measurments in a multi-path site",
*Gabriela Masgras (Constantin)* (Maritime University of Constanța, Romania), Mirel Paun (Maritime University of Constanța, Romania), Alin Danisor (Maritime University of Constanța,

Romania), Razvan Tamas (Maritime University of Constanța, Romania) (virtual)

14. "Comprehensive Evaluation of Environmental Impact on the Performance of V2V Visible Light Communication",
*Rasha S. Al Hasnawi* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Ion Marghescu (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

15. "Architectural Challenges for Optical Transmission Network Nodes",
*Mihai Bănică* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Victor Croitoru (National University of Sciences and Technologies Politehnica Bucharest, Romania)

**16:30–17:00**

**Coffee Break** ETTI Hall, A building, 1<sup>st</sup> Floor

**17:00–18:30**

**Oral session 10 (5 x 18 minutes)** *Session chair: Ana-Maria DRĂGULINESCU* A101 room, A building, 1<sup>st</sup> Floor

16. "Sea Ice Segmentation from SAR Data By Residual Convolutional Transformer Networks",
*Nicolae-Cătălin Ristea* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Andrei Anghel (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mihai Datcu (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

17. "An investigation of the operating conditions for dye-sensitized solar cells that can power devices in conjunction with supercapacitors",
*Marius-Cristian Mareș* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Gheorghe-Alexandru Mătușa (National University of Sciences and Technologies Politehnica Bucharest, Romania), Paul Svasta (National University of Sciences and Technologies Politehnica Bucharest, Romania) (virtual)

18. "Usage of geolocation databases for dynamic spectrum access in the UHF band",
*Vlad Ș. Hociung* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Andreea M. Podgoreanu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

19. "Hybrid GAN and Fourier Transformation for SAR Ocean Pattern Image Augmentation",
*Omid Ghozatlou* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Mihai Datcu (National University of Sciences and Technologies Politehnica Bucharest, Romania)

20. "Adaptive algorithms implementation on FPGA",
*Georgian Andrei* (National University of Sciences and Technologies Politehnica Bucharest, Romania), Cristian Anghel (National University of Sciences and Technologies Politehnica Bucharest, Romania)

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