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Universitatea
Politehnica
Timișoara

Research Report 2025

**Annual
Research
Report**

Politehnica
University
Timisoara

2025

Research Report 2025

Research Report, 2025

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ISSN 1841-2769

ISSN-L 1841-2769

Research
Report 2025

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Introducing the Report

"It's not the walls that make a school, but the spirit living inside."
King Ferdinand I, 1923

The needs for a modern society, in the context of a competitive global market, require highly skilled human resource development. In this context, the role of universities in the innovation process has increased continuously over time because the development of new products or technologies depends more and more on the findings of scientific research.

Established in 1920, shortly after the union of Romanian territories, in a European context marked by the redefinition of states and by the aftermath of World War I, the Polytechnic School in Timișoara – as it was originally called – was the answer to one of the requirements of the Romanian society of the time, namely the formation of engineers.

The mission of the Politehnica University Timisoara (UPT) is to offer nationally competitive and internationally recognized opportunities for Learning, Research, and Innovation at the highest levels of excellence. As a resource of knowledge for the public, the university builds partnerships with other educational institutions, community organizations, government agencies, and the private sector to fulfil the requirements for competencies of the societal environment through superior professional training for students and graduates.

The present Research Report of Politehnica University Timisoara gathers the main results obtained through the research activities carried out within the university in 2025, Politehnica being renowned as a remarkable actor on the stage of scientific research, both at national and international level. Our research activity is facilitated by the existence of thirty-two research centers specialized in fields that are capital for the sustainable development of any modern society. Each of these research centers brings together various prestigious researchers, whom, by their effort and vision, provide UPT with the incentives needed to contribute to the progress of our society.

Most of the research activity carried out by our institution is financed through external sources, obtained either from national and international calls for projects, or through agreements with private companies. This represents a confirmation of the superior quality of the research, but also of the prestige and professional deontology of the researchers affiliated to our institution. Politehnica's reputation as an institution of advanced research is also emphasized by the patents obtained by its researchers, by the medals and prizes obtained in both national and international competitions, and by the collaborations with important research centers and institutes from Romania and from abroad.

Each year we select the most talented young researchers for our doctoral school, providing them with the opportunity to transform their knowledge and ideas into the innovations of tomorrow. Many of them take part in peer learning programs and consolidate in this way the relationship between our university and similar partner institutions. They strive for becoming doctors in science.

This report is divided into sixteen sections, each one presenting a specific component of the research activity performed within the institution.

The first section focuses on the research infrastructure, which comprises the thirty-two research centers hosted by the university. The order in which they are presented is given by the research fields. The research centers, respectively teams of researchers, on different themes, are highly important for our university since they manage to put into practice the scientific research strategy of the university successfully, within the framework of numerous grants and contracts won by competition. The research results are materialized in papers, patents and products, all bringing for the University prestige, as well as important funds.

The second section of the Research Report presents Renar accredited laboratories of the Politehnica University Timisoara.

Research Report 2025

The third section of the Research Report is dedicated to the Scientific Excellence Awards and Distinctions. These prestigious awards celebrate those colleagues who have made a significant contribution in their field of research and continue to inspire future generations to get involved in science.

The fourth, fifth and sixth sections include the research projects implemented by the university. The fourth and fifth sections includes the projects supported by public funds, both national and international, while the sixth one includes the projects supported by private funds awarded by companies.

For the purposes of this report, we have selected the most relevant and representative projects for our research strategy.

The innovative capacity of Politehnica University Timisoara is supported by its academic and research staff, as evidenced by the patents presented in Section 7.

Politehnica University Timisoara recognizes scientific excellence by conferring the honorary titles of Doctor Honoris Causa and Honorary Professor on distinguished researchers for their contributions to the development of the University and for their continued support, as reflected in section eight of this Report.

Sections nine and ten include the habilitation theses and Ph.D. theses defended in 2025 in our University.

Section eleven provides an overview of the most relevant international scientific conferences that brought together scholars and professionals from Romania and from abroad. The conferences hosted by our University encouraged the dialogue, facilitated the exchange of ideas, and provided valuable opportunities for new collaborations.

Section twelve presents the scientific journals published by our University. In 2025, these periodicals covered a wide range of fields, including engineering, manufacturing, nonconventional technologies, mathematics and physics, modern languages, management and hydrotechnics.

The dissemination of research results and findings is an integral part of the research process and an of an academic career. Sections thirteen and fourteen present the most relevant research outputs published in 2025. These sections include the results obtained by our researchers, namely papers that have received recognition from some of the most prestigious journals, both in Romania and abroad.

Section fifteen comprises a collection of books written by our researchers, most of them published by Politehnica Publishing House. Finally, section sixteen features three book chapters authored by our researchers, one of which is indexed in the Web of Science.

Through research, we generate ideas; through ideas, we foster innovation; and through innovation, we contribute to improving the quality of life. This is why research is our priority.

RESEARCH CENTERS

Center for Innovation and Technology Transfer Politehnica 2020 (CITT) of the Politehnica University Timisoara

In the 11th of November 2020, the **Center for Innovation and Technology Transfer (CITT) Politehnica 2020** received the provisional authorization from the Ministry of Research, Innovation and Digitalization, for a 12 month period, followed by a **permanent accreditation order** signed on the 19th of January 2022 in the fields of:

- ✓ *Eco-nano-technologies and advanced materials*
- ✓ *Information and communication technologies*
- ✓ *Energy, environment and climate change*

The **mission** of CITT is the general stimulation of the collaboration activity between the Research Centers within the Politehnica University Timisoara and the economic and industrial environment, by supporting and encouraging the technological transfer, in order to introduce in the economic circuit the research results transformed into products, processes and new or improved services. CITT mediates the additional steps that separate laboratory knowledge from industrial technology.

The **vision** of the CITT is in line with the strategic policy of the European Union for economic growth for the next ten years, with efforts to gradually align with recent guidelines of EU policy dictated by the need to increase capacity and competitiveness of education and research – development – innovation presented in the NDP National Development Plan 2007-2013 and their compatibility with similar systems in the European Union.

The general **objectives** of the CITT are:

- a) Increasing the visibility of the research-innovation activity within the Politehnica University Timisoara regionally, nationally and internationally;
- b) Consultation of the academic community, through the representatives of the research centers, for the implementation of the mission assumed by the Strategic Plan;
- c) Training and development of human resources involved in the realization of projects;
- d) Initiating, promoting and advising inter- and multidisciplinary collaboration for the realization of projects;
- e) Supporting the achievement of the performance indicators of the Politehnica University Timisoara for the internal self-evaluation of the quality and the promotion of the quality in research;
- f) Modernization and efficiency of the material base necessary for the development of scientific research in the university;



- g) Orienting the research of the Politehnica University Timisoara towards the needs of the society on medium and long term and promoting the industrial doctorates;
- h) Achieving an efficient management of the research – development – innovation activity;
- i) Strengthening the dimension of national and international cooperation;
- j) Creating a climate of trust and scientific cooperation between UPT teachers, based on decision-making transparency;
- k) Periodic evaluation of the results of scientific research and research – development – innovation centers;
- l) Efficient management of technology transfer results through continuous updating of data, operation of the database and conducting statistical studies on activities;

The **role** of CITT is materialized through:

- a) Negotiating and drawing up research contracts, service contracts or partnership agreements with industrial partners;
- b) Supporting inventors to prove the concept and pre-industrial validation. CITT will also manage the protection of intellectual property generated by the institution. This includes identifying sources of funding, both internal and external, for the registration of applications for intellectual property protection (such as patents, trademarks or copyrights);
- c) Negotiation and preparation of license agreements and transfer of intellectual property to industry, with or without the support of specialized external legal advisers;
- d) CITT will encourage and support the creation of new companies.

CITT has the following **attributions**:

- a) Promotes the activity of innovation and technological transfer;
- b) Contributes to the implementation of the results of scientific research and advanced technologies;
- c) Ensures the access of SMEs to the technological services and RDI infrastructure of the Politehnica University Timișoara;
- d) Provides assistance for technology acquisitions (domestic or import);
- e) Ensures the realization and administration of product packages (CDI-production transfer documents);
- f) Ensures the efficient transfer of the results of the RDI teams to the production departments of the companies;
- g) Ensures the participation in competitions for RDI projects financed by the Romanian Government through the Ministry of National Education and in the projects financed by the EU;
- h) Elaborates statistical or feasibility studies for the activities carried out.

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<https://www.facebook.com/CITT.UPT/>

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CITT in 2025

- More than 40 meetings and discussions with 15 companies focused on innovation, technological and know-how transfer. Two frame contract signed with **Jungheinrich România** and **Aluvista** focused on innovation support for product development and production processes improvement.
 - During 2025, CITT has successfully represented UPT in a series of International Invention Fairs:
 - International Exhibition **"INVENTCOR"**, Deva, Romania, 3 -5 April 2025;
 - **IDEA-EXPO 2025** IDEA, Novelty, Invention, International Exhibition and Fair, Szentes, Hungary, 16 – 18 May 2025;
 - International Fair of Innovation and Creative Education for Youth (**ICE-USV**), Suceava, Romania, 23 – 25 May 2025;
 - **International Salon of Invention and Innovative Entrepreneurship, Chișinău**, Moldova, 6-7 June 2025;
 - International Exhibition of Inventics **"Inventica 2025"**, Iasi, 25-27 June 2025;
 - International Exhibition of Inventics **"Inventica 2025"**, Iasi, 25-27 June 2025;
 - International Exhibition of Inventions and Innovations **"Traian Vuia"** Timișoara, Romania, 3 – 4 October 2025;
 - International Salon of Scientific Research, Innovation and Invention **"PROINVENT 2025"** Cluj Napoca, Romania, 15-17 October 2025;
 - International Innovation and Invention Show **EUROPOLITEHNICUS 2025**, Bucharest, Romania, 21-23 November 2025
- Totaling **143 distinctions**, as detailed below:
- **33** special prizes;
 - **10** Diplomas for Excellence;
 - **89** Gold Medals;
 - **6** Silver Medals;
 - **5** Bronze Medals;
 - CITT has also supported **2 tech transfer projects** with industrial partners offering administrative and contracting support and consultancy. In June 2025, CITT has successfully completed the **SR EN ISO 9001:2015** audit to maintain the **quality management system** for:
 - Scientific and technological assistance and information;
 - Coordination of innovation, dissemination, transfer and capitalization of research results



Research Institute for Renewable Energy

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Research Center for Smart Energy Conversion and Storage

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"Ștefan Nădășan" Research Laboratory for Strength, Integrity and Durability of Materials, Structures and Conductors

Director: Prof. Dr. Eng. Liviu MARȘAVINA

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Research Center for Materials Mechanics and Structural Safety

Director: Acad. Prof. Dr. Eng. Dan DUBINĂ

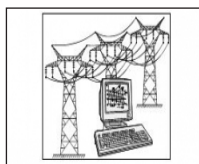
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<https://eertis.eu>



Research Center for the Processing and Characterization of Advanced Materials

Director: Assoc. Prof. Dr. Eng. Bogdan RADU

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Research Center for Power Systems Analysis and Optimization

Director: Assoc. Prof. Dr. Eng. Constantin BARBULESCU

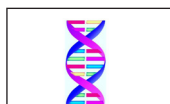
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Competence Center for Plastics Processing

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Research Center for Hydrotechnics and Environmental Protection

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Research Center for Infrastructure for Civil Engineering and Transport

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Research Center for Automatic Systems Engineering

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Research Center for Medical Engineering

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Research Center for Integrated Engineering

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Research Center for Thermal Machines and Equipment, Transportation and Environmental Pollution Control

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Research Center for Inorganic Materials and Alternative Energy

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Research Center for Materials and Industrial Technologies

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Research Center for Mechatronics and Robotics

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Research Center for Advanced Study Methods for Physical Phenomena

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Research Center for Multimedia

Director: Prof. Dr. Eng. Radu VASIU

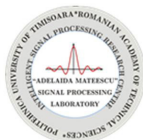
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Research Center for Urban Planning and Architecture

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Research Center for the Rehabilitation of Buildings

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RENAR ACCREDITED LABORATORIES

RENAR ACCREDITED LABORATORIES OF THE POLITEHNICA UNIVERSITY TIMISOARA

Laboratory for Fuel Analyses, Ecological Investigations and Pollutant Dispersion

Head of laboratory: Prof. Dr. Eng. Ioana IONEL

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<https://mediu.ro/wp-content/uploads/2025/10/certificat-RENAR-nou-oct.-2025.pdf>,
https://renar.ro/index.php/oec/get_oec_details/43927
<http://mettcp.mec.upt.ro/laboratoare.html>

Laboratory of Acoustics and Vibration

Head of laboratory: Prof. Dr. Eng. Nicolae HERIȘANU

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https://www.renar.ro/index.php/oec/get_oec_details/43467

EFFORTS TO PROTECT THE ENVIRONMENT AND MITIGATE THE EFFECTS OF CLIMATE CHANGE ARE BEING PURSUED IN UPT, THROUGH EXTENSIVE RESEARCH ACTIVITIES

- Politehnica University Timișoara (UPT) has accumulated more than 18 years of activity certified by RENAR, supporting environmental protection and climate change mitigation.
- These activities are carried out through two accredited laboratories: **the Acoustics and Vibration Laboratory (LAV)** and **the Laboratory for Fuel Analysis, Ecological Investigations, and Pollutant Dispersion (LACIEDIN)**.
- Both laboratories operate as Conformity Assessment Bodies in compliance with **SR EN ISO/IEC 17025:2018**.

LACIEDIN – Laboratory for Fuel Analysis, Ecological Investigations, and Pollutant Dispersion

- **LACIEDIN** builds upon the ISCIR accreditation granted to UPT in 1994. • Its initial development was supported through equipment donations and expertise transfer provided by the Alexander von Humboldt Foundation, along with contributions from other institutions in Germany and Austria.
- In 2025, **LACIEDIN** successfully obtained **reaccreditation** for a new four-year cycle, covering 14 procedures within its accredited scope; this accreditation remains valid until 2029. • In addition to contract-based collaborations with industry, **LACIEDIN** actively contributes to both applied and fundamental research, as reflected in a significant number of scientific publications. • The laboratory also plays a key role in academic training, supporting doctoral candidates and students in acquiring practical competencies and advanced knowledge in air quality assessment.
- With more than 160 completed contracts in partnership with private and state-owned enterprises, including multinational companies, **LACIEDIN** has established a strong reputation for technical expertise, reliability, and professional integrity.

LACIEDIN Personnel:

- Assoc. Prof. Dr. Florin DRĂGAN, Legal Representative
- Prof. Dr. Eng. Ioana IONEL, Lab Chief
- Lecturer Dr. Eng. Daniel BİSORCA, Quality and Technical Assistant
- Assoc. Prof. Dr. Delia Gabriela TRIF-TORDAI (Physics), Technical Assistant
- Assoc. Prof. Dr. Eng. Ramon Mihai BALOGH, Technical Assistant
- Assoc. Prof. Dr. Eng. Virgil STOICA, Technical Assistant
- Eng. Robert Ștefan Parmanche, Acquisition Assistant
- Prof. Dr. Eng. Nicolae HERIȘANU, External Auditor
- Soc. Venera Stanca NICOLICI, External Auditor
- Ec. Anca ROGOZ, Financial Officer
- Ec. Gabriela NAGHI, Payroll Officer
- Eng. Econ. Florin-Alexandru BUDE, Website Administrator

- Relevant activities and infrastructure related to **LACIEDIN** are illustrated in Fig. 1–4.



Fig. 1 LACIEDIN Research Team – Institutional Meeting



Fig. 2 Certificate of Accreditation for LACIEDIN



Fig. 3 Mobile Environmental Monitoring Unit (LACIEDIN)



Fig. 4 Measurement and Analysis Equipment – LACIEDIN Laboratory

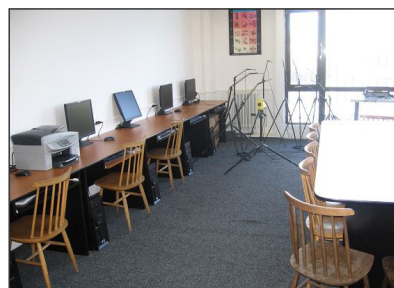


Fig. 5 Acoustics and Vibration Laboratory – LAV

LAV – Acoustics and Vibration Laboratory

- The **Acoustics and Vibration Laboratory (LAV)** within Politehnica University Timișoara was established in 2007 through a CEEEX research project awarded via national competition to Prof. Dr. Eng. Nicolae HERIȘANU and funded by the Ministry of Education and Research.
- Since its establishment, the laboratory has maintained continuous accreditation under certificate no. LI 747, granted by RENAR, the national accreditation body, valid until January 2029, confirming its technical competence and compliance with internationally recognized quality standards.
- **LAV** is authorized to issue accredited test reports covering environmental noise, occupational noise, and human exposure to vibrations in the workplace.
- Over the past 18 years, the laboratory has benefited from the scientific guidance and expertise of two distinguished former UPT professors and recognized specialists in their respective fields:
- Prof. Dr. Vasile BACRIA (PhD in Physics – Acoustics) and Acad. Prof. Dr. Vasile MARINCA (PhD in Mathematics – Vibrations).



Fig. 6 Certificate of Accreditation for the LAV

SCIENTIFIC EXCELLENCE AWARDS AND DISTINCTIONS

Politehnica University Timisoara, in the [Research.com](#) ranking of the best universities in 2025. Five professors, among the most important scientists in the world: Radu-Emil PRECUP, Ion BOLDEA, Ștefan PREITL, Liviu MARȘAVINA and Emanoil LINUL

• [Research.com](#), one of the most important portals dedicated to researchers/scientists in universities, has released the ranking of the best universities in 2025, which also includes higher education institutions in Romania, the main tie-breaking criterion being the sum of the values of the D index (equivalent to the Hirsh index taking into account only the works in the field and citations) of all the top scientists affiliated to a certain university.

• According to [Research.com](#), five prestigious researchers of the Politehnica University Timisoara are among the world's research elite, contributing decisively to positioning the institution on the 1st place in Romania and the 1598th place in the world in the [Research.com](#) ranking for the year 2025.

• The Politehnica University Timisoara stands out in the 2025 [Research.com](#) ranking, by solid results in strategic areas, ranking 1st in Romania in **Electronics and Electrical Engineering**, where it totals 1,158 publications and a D-index of 178, and ranking also in **Materials Science and Engineering and Technology**.

• These researchers achieved a cumulative D-index of 260, which reflects their outstanding scientific impact and the international relevance of their work at UPT.

Lume	Național	Detalii despre universitate	Savant	Publicații	D-Index
1598	1	Universitatea Politehnică din Timișoara România	5	1.539	260
1679	2	Universitatea Transilvania din Brașov România	4	965	224
1686	3	Universitatea de Medicină și Farmacie Carol Davila România	3	804	221
1701	4	Universitatea din București România	5	1.202	217
1907	5	Universitatea Babeș-Bolyai România	4	661	165
1995	6	Universitatea Alexandru Ioan Cuza România	3	868	145
2144	7	Universitatea de Științe Agricole și Medicină Veterinară din Cluj-Napoca România	4	598	116
2278	8	Universitatea de Medicină și Farmacie Grigore T. Popa România	1	740	98
2297	9	Universitatea de Medicină și Farmacie Iuliu Haieganu România	2	801	95

Fig. 1. National top universities by cumulative D-Index ([Research.com](#) 2025)

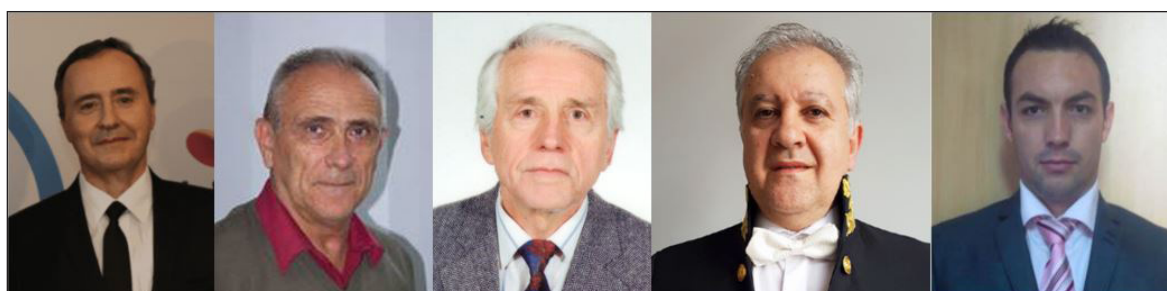


Fig. 2. Top 5 researchers included in the world ranking [Research.com](#) 2025
(from left to right: Radu-Emil PRECUP, Ștefan PREITL, Ion BOLDEA, Liviu MARȘAVINA and Emanoil LINUL)

Romanian Academy Award 2025 – „Duiliu Marcu” Award for the work titled: British International School of Timișoara – “Ana Șandor” High School Building Authors: Prof. Dr. Arch. Vlad GAIVORONCHI and Assist. PhD Stud. Arch. Simina CUC

• The Prizes offered by the Romanian Academy every year cover all domains of sciences and arts. For each discipline the prizes carry specific names belonging to remarkable personalities, former Academy members. Starting with the year 2010 a new prize was founded added to the others belonging to the arts section, the prize for ARCHITECTURE Works. It carries the name of the well known Romanian architect Duiliu Marcu (1885–1966), Romanian Academy member from 1955. Every year in December the prizes are offered for works finished two years earlier.

• On the 10.12.2025. in the Academy Aula in Bucharest were offered all prizes for the year 2023, and for ARCHITECTURE domain **The Highschool Building “Ana Șandor” BRITISH INTERNATIONAL SCHOOL TIMIȘOARA** by architects **Vlad Gaivoronschi and Simina Cuc** received the “**Duiliu Marcu**” Prize. This proposal was supported by the Romanian Architect’s Union and by architects Romeo Belea and Dorin Ștefan, both members of the Romanian Academy.

• The authors realized the whole project summing 5150 sq.m. integrating it in the context of the beautiful green square and the existing buildings of the scholar campus . The new building became a gate to the whole ensemble, also a gate to it’s ascensional space to light and knowledge, with it’s amphitheater atrio and the library at first floor – “piano nobile”.

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• The authors coordinated a team of architects in all phases of the project – concept, schematic design, final design, technical and executive project with all details and specifications, also coordinated all engineers involved (structure, mechanical, electricity, NZEB consultant, landscape, etc.), integrating the interior design by Morphoza team. To be on the construction site until the end at the final reception of the building completed architect’s missions, ensuring the construction quality together with project managers and contractors.



Romanian Academy Award 2025 – “Cristofor I. Simionescu” Prize – for the group of published papers entitled “Green synthesis routes for the biocatalytic production of oligoesters, natural surfactants, and intermediate compounds for organic synthesis”, author: Anamaria TODEA

- The “Cristofor I. Simionescu” Prize, one of the most prestigious distinctions awarded by the **Romanian Academy** in the field of **Chemical Sciences**, recognizes original scientific contributions with major impact on the development of modern chemistry and sustainable processes.
- The awarded group of papers proposes innovative green synthesis strategies, based on efficient biocatalytic processes for obtaining high value compounds such as bio based oligoesters, natural biosurfactants, biodegradable polyesteramides, and intermediates useful in organic synthesis. These studies demonstrate the advantages of biocatalysis – excellent selectivity, mild reaction conditions, and reduced use of toxic solvents and metal catalysts – thus strengthening the direction of sustainability oriented chemistry.
- The works include original developments such as the one pot synthesis of furan based oligoesters from renewable resources, the use of reactive natural deep eutectic solvents (R NADES) in enzymatic esterification reactions, and the immobilization of laccases on Ni–Zn ferrite magnetic supports, exhibiting enhanced catalytic activity. The scientific approach is supported by advanced characterization techniques (multidimensional NMR, MALDI TOF MS, thermal analysis) and by advanced computational modeling, which elucidate enzymatic selectivity and optimize synthetic pathways.
- The impact of these contributions is reflected in publications in high profile international journals and in their integration into competitive national projects dedicated to green chemistry and the circular bioeconomy. The developed research directions open perspectives for the design of biodegradable biomaterials, natural biosurfactants, and innovative processes for the valorization of renewable resources. Through their originality, rigor, and applied relevance, the awarded works significantly advance the fields of biocatalysis and green chemistry, highlighting the potential of these technologies in the transition toward a sustainable chemical industry.
- The award was granted to **Assoc. Prof. Dr. Eng. Anamaria TODEA**, whose research work significantly contributed to these results.



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Romanian Academy Award 2025 – “Constantin Budeanu” Award for the group of works entitled “Contributions to modeling and testing of electric motor/generator drives for better performance”, authors: Adrian-Daniel MARTIN and Liviu-Dănuț VITAN

- The “Constantin Budeanu” Award, granted by the **Romanian Academy** is one of the highest distinctions in Romania in the field of **Technical Sciences**. Named after the prominent Romanian engineer and academician Constantin Budeanu, the award recognizes outstanding scientific contributions with significant theoretical, experimental, and applied impact, reflecting excellence and international relevance.
- In 2025, the award was granted to a research team including **Lecturer Dr.Eng. Adrian-Daniel MARTIN** and **Assist. Prof. Dr. Eng. Liviu-Dănuț VITAN** for the group of works entitled “**Contributions to modeling and testing of electric motor/generator drives for better performance.**” This distinction acknowledges a sustained and coherent research activity developed over several years, combining advanced modeling, numerical simulation, and experimental validation in the field of electric drive systems.
- The awarded research focuses on the development of innovative propulsion solutions for urban electric mobility, with particular emphasis on the integration of alternative energy storage technologies.
- A central contribution is the proposal and validation of a novel electric propulsion architecture for a mini-city bus, in which energy is stored in supercapacitors instead of conventional lithium-ion batteries. This approach enables ultra-fast charging, compatible with short station dwell times, and offers significant advantages in terms of power density and operational flexibility.



- The proposed system integrates an advanced interior permanent magnet synchronous motor (IPMSM) with optimized electromagnetic design, together with a high-performance bidirectional DC/DC converter for efficient energy management.
- The research introduces improved control strategies for the traction system, ensuring reduced current ripple, enhanced dynamic performance, and efficient energy recovery during braking.
- A comprehensive validation methodology was implemented, combining full-scale numerical simulations with experimental testing on a laboratory prototype. • The study includes a real-world case analysis based on an urban transport route in Timișoara, using actual operational data such as speed profiles, passenger load, and environmental conditions.
- The results demonstrate the technical feasibility of the proposed solution, confirming that supercapacitor-based energy storage can support complete route operation without intermediate charging.
- In addition to technical validation, the research includes an economic assessment over the entire lifecycle of the system, indicating a significant reduction in total costs compared to conventional battery-based solutions. The results highlight the potential of the proposed concept to contribute to the development of efficient, sustainable, and cost-effective urban transport systems.
- The scientific contributions have been disseminated through high-impact publications, including IEEE Transactions on Industry Applications, and are supported by a series of complementary studies indexed in IEEE Xplore. Overall, the awarded work advances the field of electric drive systems and provides a solid foundation for future developments in sustainable and high-performance electric mobility.

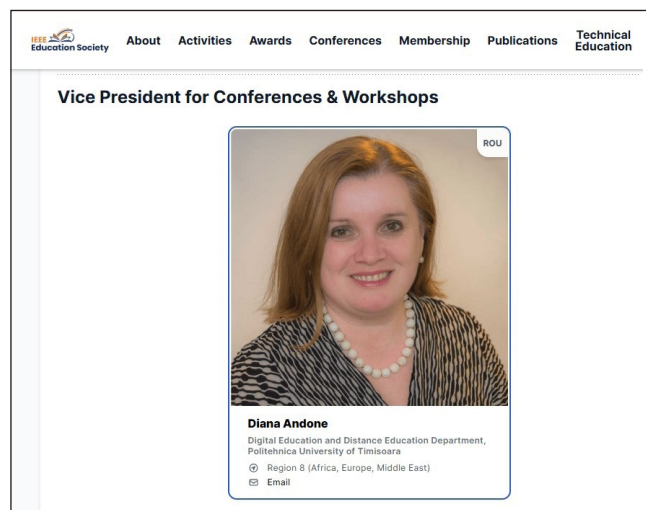
Prof. Dr. Eng. Radu-Emil PRECUP, corresponding member of the Romanian Academy, elevated to the grade of IEEE Fellow

- In January 2025, **Prof. Dr. Eng. Radu-Emil PRECUP**, corresponding member of the Romanian Academy, Information Science and Technology Section, was elevated to the grade of **IEEE Fellow** of the renowned professional organization, the Institute of Electrical and Electronics Engineers (IEEE), for his "contributions to fuzzy and data-driven control of servo systems".
- **IEEE Fellow** is the highest level of membership in the IEEE and is recognized as a prestigious honor and an important career achievement. This title is awarded each year to no more than 0.1% of the total IEEE voting membership; it is given out after a rigorous evaluation process by the IEEE Fellow Committee.
- **Radu -Emil PRECUP**, currently **director of the Council for Doctoral Studies at the Politehnica University Timișoara**, is the **third IEEE Fellow** affiliated with Romania (<https://services27.ieee.org/fellowsdirectory/keywordsearch.html?keyword=Romania>), after Acad. Ion Boldea, from the Politehnica University Timișoara and the Technical Sciences Section of the Romanian Academy (since 1996) and Prof. Horia Chiriac, from the "Alexandru Ioan Cuza" University of Iași (2011).
- This distinction is not only a personal milestone for Prof. Precup, but also a recognition of his dedicated work and the support he has received from his colleagues and mentors over the years.
- This also recognizes the hard work of his former and current Process Control Group researchers and students; they have enabled him to contribute meaningfully to research and industry.



- The IEEE (<https://www.ieee.org/>) is an international organization that supports the advancement of technologies based on electricity. In terms of membership, the IEEE is the largest engineering organization in the world, with over 400,000 members in 190 countries and 38 technical societies worldwide.
- The organization is a world leader in a wide variety of fields, including electrical engineering, electronics, automation, telecommunications, computers, aerospace systems, biomedical engineering, information technology, and related fields.
- IEEE publishes approximately one-third of the world's technical literature in electrical engineering, computer engineering, electronics, and automation, and has an active portfolio of 1,144 standards.
- The organization sponsors over 2,000 scientific conferences each year.

Dr. Diana ANDONE, re-elected for the position of Vice President of the IEEE Education Society (IEEE Global Elections, November 2025)



- Dr. Diana Andone was re-elected for the position of **Vice President for Conferences and Workshops** of the IEEE Education Society, after the global online elections held in November 2025.

- The official announcement was made on the IEEE Education Society web page:

<https://iee-edusociety.org/post/announcement/ieee-education-society-2026-2027-officer-election-results>

- Director of the Digital and Distance Education Department and Associate Professor at UPT, **Dr. Diana Andone** is an internationally distinguished expert in digital and open education (OER), virtual and augmented reality, artificial intelligence in education, and the development of complex e-learning ecosystems.

- **Dr. Andone's** trajectory within the IEEE Education Society began as a member of the **IEEE Board of Governors (2022-2023)**, subsequently becoming the **first Romanian to be elected** to serve as **Vice President of Conferences, Workshops, and Events** during the 2024-2025 term. Her leadership and strategic impact were recently reaffirmed by her re-election to the **Vice-Presidency for Conferences & Workshops: 2026-2027 term**, a role in which she will continue to orchestrate global strategies for the Society's scientific events and publications.

- She also holds the title of "**Distinguished Lecturer**" for 2024-2025 and is an active member of the IEEE Romania Executive Committee, having previously been recognized with the prestigious "**Distinguished Chapter Leadership**" (2021).

- In her upcoming mandate, **Dr. Diana Andone** aims to strengthen the IEEE Education Society by enhancing the visibility of its flagship conferences and optimizing the management of educational resources for its members. Building on her experience as Vice President (2024-2025), she intends to „continue to integrate the activities initiated in the last 2 years” and to „increase the recognition level of reference conferences” by implementing unified frameworks for editorial processes and submission consistency.

- A key priority remains „the attractiveness of the society to members, especially to women, young members, and students.” To achieve this, her vision includes the strategic use of „digital tools for event and publication management” to streamline hybrid formats and audience engagement. Furthermore, **Dr. Andone** will focus on organizing regional and national activities that address emerging trends such as artificial intelligence in education and science, educational technologies, and the benefit of using **Open Educational Resources (OER)** in engineering education.

- IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity, encompassing more than 420,000 members across 190 countries. **The IEEE Education Society**, a prominent technical society within IEEE, specifically addresses the theory and practice of engineering education, fostering a global community of professionals dedicated to enhancing educational technologies and methodologies.

International Network for Economic Research, Prof. Dr. Ec. Claudiu ALBULESCU elected as the Third Vice-Chair of the INFER Board



- The International Network for Economic Research (INFER) is an international organization in the field of **economic research**, established in the 1990s in Germany.
- The aim of the organization is to facilitate research collaborations in all economic fields, to organize scientific events, to provide opportunities for the dissemination of research results and to become a partner for the promotion of major research projects.

- Several universities and research centres are institutional members of INFER.
- At their annual meeting held in Rome on 10th September 2025, the INFER members elected the new board of the organization.
- Prof. Claudiu - Tiberiu ALBULESCU was elected as the **Third Vice-Chair** of the INFER Board.

3rd Vice-Chair: Claudiu Albulescu



Polytechnica University Timișoara

Organiser: INFER Workshop 2014, 2019; INFER AC 2022

Current responsible of Internal Publications and INFER Awards

Research areas: Banking, Environmental Economics, Macroeconomics



EDEN Senior Fellow Award – Assoc. Prof. Dr. Eng. Vlad MIHĂESCU (Bologna, EDEN Digital Learning Europe 2025 Annual Conference)

- **Assoc. Prof. Dr. Eng. Vlad MIHĂESCU**, member of the Digital Education and Distance Education Department of Politehnica University Timișoara and Associate Professor in the Faculty of Electronics, Telecommunication and Information Technologies, received the **EDEN Senior Fellow Award**, one of the most prestigious annual awards of the EDEN Digital Learning Europe community, **as recognition of his significant contributions to the development of E-learning in Europe and for his valuable commitment and support for the evolution and progress of EDEN.**

- The award was presented by Prof. Wim Van Petegem, President of EDEN DLE, at the **EDEN Digital Learning Europe 2025 Annual Conference**, held in Bologna, Italy. The conference, themed **“Shaping the Future of Education in the Age of AI”**, brought together over 300 delegates from more than 150 institutions and 40 countries.

- “Joining the very select group of approximately 50 experts from around the world who have received this distinction over the past 20 years is not only a great honour, but also a profound responsibility for the future — there is still much to be done, and I am committed to continuing this important work for EDEN, representing Politehnica University Timișoara with dedication within the organisation.”

- **Assoc. Prof. Dr. Eng. Vlad Mihăescu, Vice-President of the UPT Senate**

- **Assoc. Prof. Dr. Eng. Vlad MIHĂESCU** is Vice-President of the UPT Senate and the Vice-President for Membership and Communication of the EDEN Management Board. With this recognition, he joins a select community of ~50 global experts distinguished by EDEN for outstanding work in open, distance, and digital education.

- The purpose of the **EDEN Fellow Awards** is to provide validation and support to professionals in Europe in this field and to increase their mobility in Europe through a respected recognition system.

- The first Senior Fellow and Fellow Awards as an idea were initiated by Professor Alan Tait. The introduction of the EDEN Fellow Awards professional recognition system took place for the first time at the 2007 Annual Conference in Naples.



Prof. Lăcrămioara STOICU-TIVADAR was elected as EFMI Honorary Fellow during the MIE 2025 Conference in Glasgow

- **Lăcrămioara STOICU-TIVADAR**, professor at the Faculty of Automation and Computers of Politehnica University Timișoara was elected **Honorary Fellow** of the European Federation for Medical Informatics (EFMI) for her dedication, commitment and long-term services to EFMI and for her contributions to the field of Medical Informatics in Romania, Europe and internationally.
- The award ceremony took place during the **EFMI MIE 2025 International Conference**, an event organized by the British Computer Society, IT in Healthcare Division, which took place at the Technology and Innovation Centre of the University of Strathclyde, Glasgow, UK.
- The theme of the conference was **"Intelligent Health Systems – from Technology to Data and Knowledge"**.
- The title of **Honorary Fellow** is granted by election and voting by the EFMI Council, upon the proposal of the EFMI Board, to a person within the organization who has significant achievements in the development of the field of digital health and has made outstanding contributions that have led to the development of EFMI activity.
- In 2018, **Lăcrămioara STOICU-TIVADAR** took over the presidency of EFMI for a 2-year term (2018-2020) and then as vice-president of the International Medical Informatics Association – IMIA for a 2-year term (2020-2022).
- In 2021, she was elected as member of IAHSI – The International Academy of Health Sciences Informatics, based in Switzerland, upon the proposal of two full members, during elections held in the plenum of the Academy. IAHSI brings together specialists from all over the world, whose contributions to medical informatics are internationally recognized.
- She created a position of young researcher in the EFMI Board and from there developed a collective and an activity that consolidated EFMI, also she built the mechanisms to access European projects as an organization and coordinated the complex EU Horizon2020 project **HosmartAI - Hospital Smart development based on AI** (2020-2024), consolidated the financial situation of EFMI, encouraged cooperation between member societies through joint activities contributing to the cohesion of the Federation, and increasing its prestige.
- In the educational field, she initiated and coordinates **the Master in Information Systems in Healthcare at UPT** (2009-present) and published under UPT affiliation more than 200 papers and books. In November 2024, she chaired the Conference of the European Federation for Medical Informatics, EFMI STC 2024, an event organized by the Romanian Society of Medical Informatics and hosted by the Conference Centre of University Politehnica Timișoara.

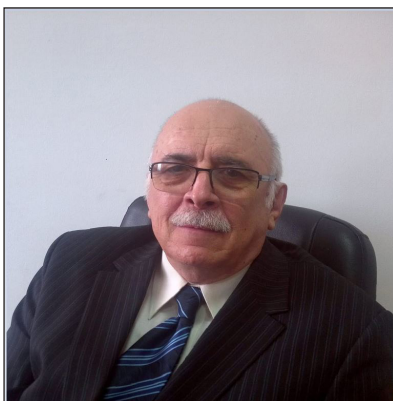


Mircea VLĂDUȚIU, Professor Emeritus, UPT, Honorary Member of Romanian Academy of Technical Sciences, DHC, IEEE Life Senior Member “The Romanian Academy Award at 2025 Gala of Banatian Excellence”

- The Romanian Academy Award granted within the framework of the 12th edition of the **Banatian Excellence Gala in 2025** represents a recognition of long-term academic and scientific activity dedicated to higher education, research, and service to the academic community, deeply connected to the engineering tradition of the Banat region.

- More than five decades of professional activity at the Politehnica University Timișoara have been devoted to the development of computer architecture, testing methodologies, system reliability, and fault-tolerant computing, as well as to the education of numerous generations of engineers and researchers.

- Many of these former students and collaborators have achieved significant results at both national and international levels. Beyond technical achievements, this work has focused on the design of dependable computing systems for industrial applications, capable of operating correctly and predictably in real-world environments.



- The recent extension of research interests toward quantum computing, materialized through the supervision of the first doctoral thesis in this field in Romania and the recognition received in 2025, reflects a continuous engagement with emerging technological paradigms and with the new challenges of reliability in next-generation systems.

- The **Romanian Academy Award** therefore represents not only an individual distinction, but also a confirmation of the collective academic effort developed within the university, the formative role of the institution, and the continuity of a technical school grounded in rigor, responsibility, and academic integrity.

- Throughout its history, the Politehnica University Timișoara has represented a strong center of applied engineering, where theoretical rigor has been consistently combined with practical and responsible technological solutions. Within this institutional framework, the domains of testing and reliability have not been treated merely as specialized technical fields, but as essential components of an engineering culture centered on prevention, systematic evaluation, and continuous improvement.

- The development of these areas has naturally encouraged interdisciplinary perspectives. In a manner analogous to medicine, which seeks to diagnose and prevent the deterioration of the human body, engineering focuses on identifying faults and maintaining the healthy operation of technical systems. In both domains, reliability is achieved through rigorous processes of monitoring, analysis, and intervention.



Banat Excellence Gala 2025 - “Traian Vuia” Award for “Engineering Sciences”, Prof. Dr. Eng. Toma Leonida DRAGOMIR



• The “Banat Excellence Gala” is an annual event organized in partnership with the **Romanian Academy**, having the role of recognizing, at regional and national level, those who perform in the most important fields of science, culture, and arts but also of social responsibility and of promoting Banat region. The “Traian Vuia” award, within this gala, is offered every year to some personalities of the Politehnica University Timișoara, and its 2025 winner was professor **Toma-Leonida DRAGOMIR**.

• **Professor Dr. Eng. Toma-Leonida DRAGOMIR** (born 20.01.1945, Sibiu, România) completed high school in Oradea in 1963 and graduated from the Faculty of Electrical Engineering at the Politehnica Institute Timișoara in 1968. He taught at the same institute, now known as the Politehnica University Timișoara, from February 1969 to September 2022.

• He served as vice-dean of the Faculty of Automation and Computers and head of the Department of Automation and Applied Informatics. He is currently a member of the university's doctoral school.

• As a university professor he covered disciplines related to electrical engineering (bachelor programmes), automation (bachelor and master programmes), quality assurance (master programmes), and ethics and academic integrity (doctoral studies). Since 1990, he has supervised 23 graduated doctoral candidates in the area of Automatic Systems. He has been focused on quality assurance in higher education since 1999 and became **the first director of the General Directorate of Quality Assurance** at the university in 2005. He served as the director of the Department of Automation and Applied Informatics.

• **Professor DRAGOMIR's** primary area of scientific research is the **application of Systems Theory and Control Theory to automation** within electrical engineering and power engineering, robotics, medical fields, and electronics.

• He was a member of several bodies that coordinated and evaluated scientific activity in Romania. Collaborations took place with researchers from both Germany and Austria. He is a **member of the Academy of Technical Sciences of Romania**, namely of its **Electronics - Automation Section**.

• He had a notable long-term collaboration with the Research Center of UCM Reșița, which focused on designing and developing controllers for voltage and speed in small to medium power hydro generators.

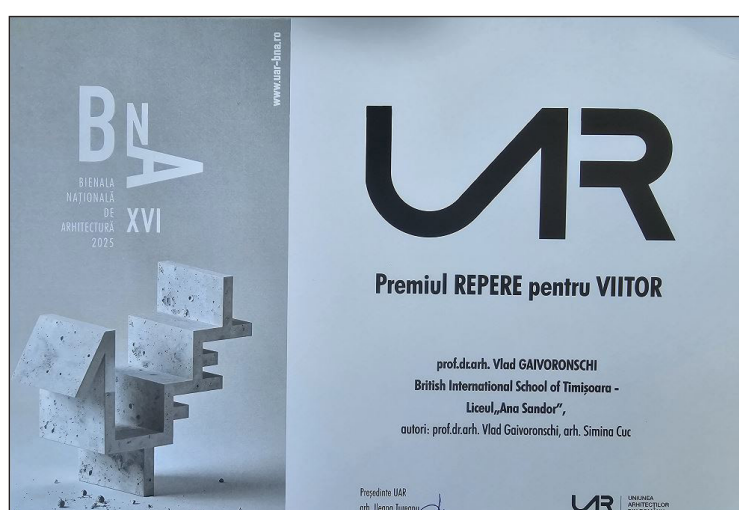


• In teaching and scientific research, Mr. **DRAGOMIR** published books, manuals, articles, led and collaborated on the execution of research projects, presented papers at international conferences and symposia. He reviews a large number of journals and conferences, both in Romanian and abroad.

Research Report 2025

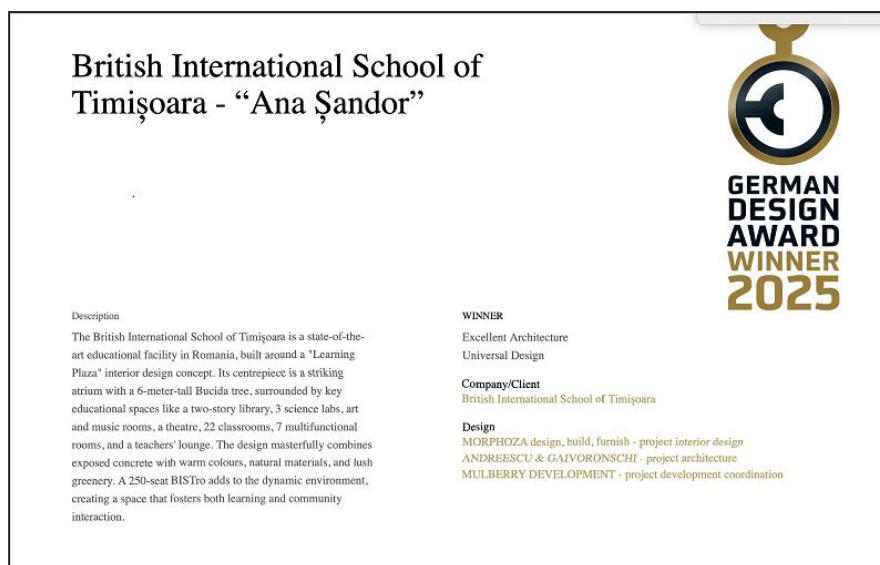
2025 National Architecture Biennial – “Repere pentru viitor - Milestones for the Future” award for the work titled *British International School of Timișoara - “Ana Șandor” High School building*, Authors: Prof. Dr. Arch. Vlad GAIVORONSKI and Assist. PhD Stud. Arch. Simina CUC

- The prize “Repere pentru viitor - Milestones for the Future” was awarded for the work titled *British International School of Timișoara - “Ana Șandor” High School building* by Prof. Dr. Arch. Vlad GAIVORONSKI and Arch. Simina CUC.
- This recognition was presented at the 2025 National Architecture Biennial, organized by the Romanian Union of Architects, on October 23 2025 at ODEON Theatre.
- The building of “British International School of Timișoara” is distinguished by the austere elegance of its volumes, by the natural way it integrates materials, and by the urban intelligence of its location. It is an architecture that educates through itself, an architecture of silence, balance, and meaning.



- Recognized through national and international awards, the work *British International School of Timișoara - Liceul “Ana Șandor”* affirms Vlad GAIVORONSKI’s position as a leading architect, professor, and advocate of a responsible and profoundly cultural contemporary architectural thinking.

Prof. Dr. Arch. Vlad GAIvoronschi, together with architect Simina CUC (coauthor), winner of the German Design Awards in February 2025 in Frankfurt for the *British International School of Timișoara – “Ana Șandor High School” building and Morphosa interior design*



• Professor Dr. Arch. Vlad GAIvoronschi, together with architect Simina CUC (co-author), was awarded the German Design Awards 2025 for the work *British International School of Timișoara – the “Ana Șandor” High School Building and Morphosa interior design.*

• This recognition highlights excellence and innovation in the fields of architecture and interior design, strengthening their position in the international architectural landscape.

• **Statement of the jury:**

“This school in Romania impresses with its contemporary spatial concept that promotes learning and creativity. The atrium with a central tree forms the centerpiece and creates a connection between the different learning areas. The combination of exposed concrete, warm colors and natural materials sets the “British International School of Timișoara - ‘Ana Șandor’ apart.”

• The British International School of Timișoara is a state-of-the-art educational facility in Romania, built around a “Learning Plaza” interior design concept.

• Its centerpiece is a striking atrium with a 6-meter-tall Bucida tree, surrounded by key educational spaces like a two-story library, 3 science labs, art and music rooms,



a theatre, 22 classrooms, 7 multifunctional rooms, and a teachers’ lounge.

• The design masterfully combines exposed concrete with warm colours, natural materials and lush greenery.

• A 250-seat BISTro adds to the dynamic environment, creating a space that fosters both learning and community interaction.

British International School of Timișoara - “Ana Șandor”

Research Report 2025

SHARE OPERA OMNIA 2025 – Awarded to Prof. Dr. Arch. Vlad GAIVORONSKI, Faculty of Architecture and Urban Planning, Politehnica University Timișoara during the SHARE Romania Forum on November 13, 2025



- **SHARE ROMANIA** is an International Forum for Architecture founded in 1997 which unites in conferences, workshops, competitions, etc. architects all around Central and Eastern Europe.

- In the last years it expanded also in Central Asia and Northern Africa becoming a respected platform promoting innovation, creativity and a fruitful dialogue between cultures.

- Every year one architect from all these countries is elected for the **OPERA OMNIA PRIZE**. Among Romanian architects, Alexandru Beldiman, Gheorghe Heres, Nicolae Taric, Florin Medvedovici and Adrian Zerva obtained this recognition in the past.

- There were also elected architects from Bulgaria, Greece, Serbia, Hungary, Poland, Slovenia, Cyprus, Albania, North Macedonia, Bosnia and Herzegovina and Kosovo in the last 27 years.

- The Prize **SHARE OPERA OMNIA for 2025** was awarded in a special ceremony to **Vlad GAIVORONSKI**, architect and professor at UPT, Architecture and Urbanism Faculty, held at **SHARE ROMANIA FORUM in Bucharest** on November 13. The rarely awarded distinction, reserved for personalities who have decisively influenced architecture through their works, ideas and intellectual generosity, recognizes the role that **Vlad GAIVORONSKI** had and continues to have in the training and inspiration of generations of architects.

- The ceremony was marked by the LAUDATIO offered by the SHARE President, **Prof. Dr. Arch. Serban Tiganas**, the Cluj Architecture Faculty Dean. His speech pointed **Vlad GAIVORONSKI's activity** since the early eighties, not only the complexity and coherence of his work, but the portrait of an architect who constantly looked beyond forms, asked essential questions and contributed to defining the identity of contemporary Romanian architecture.

- Finally **Vlad GAIVORONSKI** pointed in his short lecture his double perspective about the value of the art of architecture enhancing the quality of life and about his respect for those from he learned and he worked with.



Prof. Dr. Eng. Radu-Emil PRECUP, corresponding member of the Romanian Academy, received the Springer Nature Editorial Contribution Award

• In May 2025, Prof. Dr. Eng. Radu-Emil PRECUP, corresponding member of the Romanian Academy, Information Science and Technology Section, has been honored with the **Springer Nature Editorial Contribution Award** as part of the **Springer Nature Editor of Distinction Awards 2025** as a member of the Editorial Board of the journal *Evolving Systems*:

(<https://link.springer.com/journal/12530>)

• Prof. PRECUP has been an Area Editor of *Evolving Systems* since 2025, and a member of the Editorial Board since 2014.

• The award honors editors who meticulously manage the peer review process, which helps maintain scientific accuracy and a high-quality author experience. Springer Nature presents these awards to show appreciation for the vital role editors play in supporting authors and advancing scientific publishing.

• *Evolving Systems* is a scientific journal focusing on continuous, adaptive machine learning and dynamically evolving AI systems.

• The journal is devoted to self-learning, self-developing, self-organized, and evolving AI systems, covers original, methodological, and application-oriented papers, encourages submissions related to machine learning, AI, computational intelligence and mathematical modeling, seeks inspiration from nature, including neuroscience, bioinformatics, and quantum physics, and welcomes applications in engineering, health, environment, security, transport business, and social sciences.

• The **current impact factor** of *Evolving Systems* journal according to the 2024 Journal Citation Reports released by Clarivate Analytics in 2025 is **2.7**.



Prof. Dr. Eng. Radu-Emil PRECUP, corresponding member of the Romanian Academy, received the *IEEE Systems, Man, and Cybernetics Best Associate Editor Award* of IEEE Transactions on Cybernetics



- In October 2025, Prof. Dr. Eng. Radu-Emil PRECUP, corresponding member of the Romanian Academy, Information Science and Technology Section, has been honored with the IEEE Systems, Man, and Cybernetics (SMC) Best Associate Editor Award of the IEEE Transactions on Cybernetics, for his “outstanding service as Associate Editor of the IEEE Transactions on Cybernetics”.
- The SMC Society of the renowned professional organization, the Institute of Electrical and Electronics Engineers (IEEE), recognizes the significant achievements of its outstanding members and volunteers by presenting a number of awards.
- These awards are intended for SMC Society members, volunteers, and contributors who have made substantial contributions to the SMC Society, its fields of interest, publications, conferences, and other activities.
- The scope of the IEEE Transactions on Cybernetics: (<https://www.ieeesmc.org/publications/transactions-on-cybernetics/>) includes computational approaches to the field of cybernetics.
- Specifically, the transactions welcomes papers on communication and control across machines or between machine, human, and organizations.

- The IEEE SMC Best Associate Editor Awards recognize the best Associate Editors of the SMC Transactions. At most one Associate Editor is chosen from each of the SMC Society's Transactions.
- Editors are judged on their exceptional contributions to managing reviews and delivering timely and accurate decisions for the IEEE Transactions on Systems, Man, and Cybernetics.
- The SMC Society Award Ceremony took place in Vienna, Austria, at the 2025 IEEE International Conference on Systems, Man, and Cybernetics (<https://www.ieeesmc.org/wp-content/uploads/2025/10/smc2025awards.pdf>)
- IEEE Transactions on Cybernetics replaced the IEEE Transactions on Systems, Man, and Cybernetics Part B: Cybernetics on January 1, 2013. The current impact factor of the IEEE Transactions on Cybernetics according to the 2024 Journal Citation Reports released by Clarivate Analytics in 2025 is 10.5
- The scope includes such areas as computational intelligence, computer vision, neural networks, genetic algorithms, machine learning, fuzzy systems, cognitive systems, decision making, and robotics, to the extent that they contribute to the theme of cybernetics or demonstrate an application of cybernetics principles.



2025 Excellence Awards Gala at Politehnica University Timișoara: Award “Excellence in Research” – Young Researchers, Lecturer Dr. Eng. Gordana BARB Award “Excellence in Research” – Young Doctoral Students, Assistant PhD Student Eng. Elida-Gabriela TULCAN

• At the end of the year, Politehnica University Timisoara awarded the “Excellence in Research” prizes to young people who achieved remarkable results during the academic year 2024-2025.



• **Lecturer Dr. Eng. Gordana BARB** from the Department of Communications, Faculty of Electronics, Telecommunications and Information Technologies, UPT received the „Excellence in Research” Award at the **Young Researchers section**, in recognition of her scientific contributions and sustained research activity in the field of modern wireless and mobile communication systems.

• In 2025, her research activity resulted in a total of 12 scientific publications in international journals and conferences. Among these, 7 papers are indexed in Web of Science, including 2 Q1 articles in SCIE journals, 3 Q1 articles in ESCI journals, and 2 Q2 articles, reflecting a strong presence in high-impact scientific journals. In addition, 4 papers were published in international conferences, including three contributions presented at IEEE ICEEA & APWC and one paper at IEEE BlackSeaCom, conferences recognized for their relevance to the communications research community.

• In addition, in 2025, she served as a reviewer for the IEEE BlackSeaCom conference, contributing to the peer-review process of international research in the field of Communications.

• Overall, her scientific work comprises 38 publications in international journals and conferences, of which 24 are indexed in Web of Science, demonstrating a consistent and growing research trajectory.

• Her research interests focus on wireless communications, mobile networks (LTE, 5G and emerging 6G technologies), Internet of Things (IoT), and UAV communications, addressing key challenges related to network performance, connectivity, and next-generation communication architectures.

• Alongside her research activity, **Lecturer Dr. Eng. Gordana BARB** actively integrates recent scientific advances into the educational process, contributing to the development of courses and laboratory activities aligned with current trends in wireless and mobile communications.



• **Assistant PhD Student Eng. Elida -Gabriela TULCAN** received the “Excellence in Research – Young Doctoral Students” award in recognition of her outstanding scientific achievements.

• Her academic contributions include 25 Scopus-indexed publications and 17 Web of Science-indexed publications, as well as co-authorship of an invention patent (2025), demonstrating the high quality, international visibility, and applied impact of her doctoral research.

ARChA project: Grand Prize of the Interior Architecture Section at the Romanian National Architecture Biennale 2025

- The **Biennale of Architecture Romania (BNA)** is the most important national professional forum dedicated to contemporary architecture in Romania, organized biennially by the **Union of Architects of Romania (UAR)**.
- BNA evaluates and recognizes excellence in architectural practice, research, and cultural production through a rigorous juried process, structured across multiple specialized sections. Receiving an award at BNA represents a major professional distinction and national-level recognition.
- In this context, the **ARChA project** was awarded the **Grand Prize of the Interior Architecture Section** at **BNA 2025**, following the evaluation of an independent jury composed of: Alexandru Negoescu, Andreea Marinescu, Răzvan Lăzărescu.
- The jury highlighted the project's conceptual clarity, spatial intelligence, and its ability to reconcile architectural heritage, contemporary use, and limited resources into a coherent and flexible spatial system.
- **ARChA** is an adaptive reuse project developed within a former university canteen building in Timișoara, originally designed in the early 20th century. After decades of functional degradation, the building was reactivated through a minimal and strategic interior intervention, transforming it into a multidisciplinary platform for education, experimentation, exhibitions, and cultural events.
- The project was designed by **SC POLI-Linia SRL**, with the architectural team consisting of **Diana Giurea, Cristian Blidariu, and Cătălina Bocan**, in collaboration with **Bogdan Isopescu** and **Oana Bănescu**. The project was developed in close connection with **UPT Campus Creativ**, with technical contributions by **Eng. Mihai Fara** (electrical installations), execution by **SC Extra Prompt SRL**, and artistic intervention by **Dan Perjovschi**.

- Architectural photography was provided by **ADMO Studio (Ovidiu Micșa)**. This multidisciplinary collaboration played a key role in shaping ARChA as a hybrid space situated at the intersection of architecture, education, art, and public engagement.
- The core idea behind ARChA is **architecture as an open framework** rather than a fixed form.
- The project proposes a spatial “infrastructure” capable of continuous reconfiguration, allowing multiple programs- teaching, making, exhibiting, debating - to coexist and overlap.
- Through selective preservation, reversible interventions, and the integration of artistic contributions, ARChA operates simultaneously as an architectural space, a pedagogical tool, and a cultural catalyst.
- Beyond its architectural qualities, ARChA has proven its relevance through use: over two years of operation, it has hosted more than 60 public events, workshops, exhibitions, and academic activities, validating the project as a living laboratory for contemporary architectural practice and education.



Prof. Emeritus Dr. Eng. Ioan SÂRBU – The International Research Excellence Award granted by SCIFAX, India, for contributions and achievements in innovative research



- Professor Emeritus Ioan SÂRBU, doctoral supervisor at the Department of Civil and Building Services Engineering of the Politehnica University Timișoara, was ranked in the top 0.5% of researchers worldwide (positions: 10th worldwide and 1st in Romania in the “heating system” speciality) in the most recent ScholarGPS rankings of 2025 ([View your scholar profile and rankings](#)).

- He received new international recognition through the “[Research Excellence Award](#),” awarded in December 2025 by the scientific organisation SciFax from India at the 28th edition of the International Research Data Analysis Excellence Awards for contributions and achievements in innovative research.

- Numerous fundamental and advanced theoretical, experimental, and numerical studies were conducted, and published in different high-impact journals, and have made significant contributions to advances in the building services engineering domain with various subjects, guided by two essential features, such as energy savings and reduction of pollutant emissions, and SciFax’s Merit-based Awards Platform supports excellence in various fields in science and technology, candidates being evaluated according to of latest publications, research quality, novelty, previous achievements, research excellence and outstanding academic achievements.

- It should be noted that Prof. emeritus Ioan SÂRBU was awarded by the Romanian Academy with the “Henri Coandă” award in 2019 for the book “Solar heating and cooling systems” published by Elsevier in 2017 and by ScienceFather in 2023 with another international award, “Best paper award”, for the book “Advances in Building Services Engineering” published by Springer in 2021.

- Prof. Emeritus Dr. Eng. Ioan SÂRBU made a remarkable scientific contribution to the development of design and optimisation techniques for urban looped water and heat distribution systems, the proposal of a formula for computing the efficiency of variable-speed pumps, and the implementation of renewable energy sources, including heat pumps. All his honourable contributions and achievements in innovative research have brought him the recognition and respect of the academic society in our country and internationally by serving the Energies journal as a member of the editorial board and academic editor and another 20 high-impact journals as a reviewer, publishing over 160 articles and books indexed in Clarivate and Scopus with several over 17,000 citations and a Hirsch index of 21, inclusion in the IAHR expert registry and in the Research Promotion Committee of the ASHRAE Danube Chapter, listing in various Who’s Who publications and other biographical dictionaries, as well as through the various distinctions, awards, diplomas and medals received during his career.

- His scientific concerns did not stop after his retirement; he remained active with PhD students and younger university colleagues in the department, addressing topics related to the optimisation and modernisation of building services systems, as well as the implementation of renewable energy sources within these systems.

Sixth Edition of the International Exhibition “INVENTCOR” Deva, Romania, 3-5 April 2025

Multiple Medals and Awards for Politehnica University Timisoara

- CORNELIUGROUP Research-Innovation Association in collaboration with Politehnica University Timisoara, “Lucian Blaga” University of Sibiu and The Romanian Association of Alternative Technologies Sibiu (A.R.T.A. Sibiu) organized in a hybrid format the 6th edition of International Exhibition **INVENTCOR**, in the period 3-5 April 2025, at the Cultural Center „Drăgan Muntean” from Deva city, ROMANIA.
- During the show, inventions, research projects, products, educational programs and experimental teaching stands from universities, research institutes, companies and private inventors were presented.
- The international exhibition **INVENTCOR 2025** covers the following areas: environmental protection, materials, bio & nanotechnology, food industry, architecture, IT, AI, electronics, automotive, aeronautics, management, publications, history, medicine, agriculture, textiles. It also includes KidsCorner and InnovativeART.
- The main objective of **INVENTCOR 2025** was to show the importance of developing the innovative creative spirit, through the Power of Example with the involvement of young people and the promotion of Hunedoara County and Romania.
- The invention team of the Politehnica University Timisoara coordinated by **Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ** participated with **43 inventions/projects**.
- Following the international judging, the invention team of the Politehnica University Timisoara obtained a total of **54 awards**, as follows: **43 gold medals, 8 special prizes and 3 diplomas of excellence**, results that confirm the high level of research and innovation activities carried out within the institution.
- For more information, please visit the official INVENTCOR website:
<https://www.corneliugroup.ro/Catalogue%20INVENTCOR%202025.pdf>



17th Edition of European Exhibition of Creativity and Innovation “EUROINVENT 2025” Iasi, 8-10 May 2025 Multiple Medals and Awards for Politehnica University Timisoara

• The Politehnica University Timisoara participated, between May 8-10, 2025, in the **Euroinvent International Exhibition**, the XVIIth edition, held in Iași, with **10 inventions/projects**.

Over 640 inventions and research projects from over 30 countries were presented at this edition, the event being the largest of its kind in Eastern Europe.

• **The Euroinvent International Exhibition** is a prestigious scientific event, which promotes creativity and innovation in an international context.

• The Politehnica University Timisoara was represented by the coordinator of the team, **Lecturer Dr. Eng. Corneliu BIRTOK BĂNEASĂ**.

• Following the international judging, the invention team of the Politehnica University Timisoara obtained a total of 16 awards, as follows: **5 gold medals, 3 silver medals, 2 bronze medals and 6 special prizes**, results that confirm the high level of research and innovation activities carried out within the institution.

• The inventions were included in the **Virtual Catalogue of the EUROINVENT International Exhibition**, XVIIth edition, 2025, available online at:

https://www.euroinvent.org/cat/EUROINVENT_2025.pdf



Research Report 2025

IDEA-EXPO 2025 IDEA, Novelty, Invention, International Exhibition and Fair, Szentes, Hungary, 16-18 May 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The invention team of the Politehnica University Timisoara, represented by Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ participated in the IDEA international exhibition, held between May 16-18, 2025 in Szentes, Hungary, an event organized by the IDEA 13 Association. The event brought together researchers and inventors from all over the world, and the UPT team was present with: **10 inventions/projects**.
- The IDEA 13 Association was founded in 1996 as a non-profit organization, and since 1999 it has been regularly organizing the IDEA Exhibition, a prestigious international exhibition dedicated to invention, innovation and research, which brings together specialists from various scientific fields.
- Following the international judging, the invention team obtained a total number of **14 awards**, as follows: **10 gold medals, 3 special prizes and a Diploma of Excellence**, results that confirm the high level of research and innovation activities carried out within the institution.



- Additional photos from the IDEA Szentes 2025 Conference are available in the official photo gallery:
<https://www.5mp.eu/web.php?a=otletclub2&o=zyzj9r24bB>

IXth Edition of the International Fair of Innovation and Creative Education for Youth (ICE-USV), Suceava, Romania, 23-25 May 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The invention team of the Politehnica University Timisoara, represented by **Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ**, participated in the International Fair for Innovation and Creative Education for Youth ICE-USV, ninth edition, held between May 23-25, 2025, participating with: **2 inventions/projects**.
- The event was organized in Suceava, by the Stefan cel Mare University of Suceava.
- The "Stefan cel Mare" University of Suceava has assumed the role of "catalyst of creativity and innovation in Romanian society", becoming in recent years a national leader. These results have been achieved through the education and massive involvement of doctoral students, master's students and even from the bachelor's cycle in the field of scientific invention and creativity.
- Following the international judging, the CITT UPT invention team obtained a total of **four** awards, as follows: **two gold medals and two special prizes**, results that confirm the high level of research and innovation activities carried out within the institution.
- For more details, please visit the official ICE-USV website:

<https://ice.usv.ro/edition-ix/>

and the official ICE-USV 2025 Book: <https://ice.usv.ro/wp-content/uploads/sites/79/2025/05/ICE-USV-2025-Book.pdf>



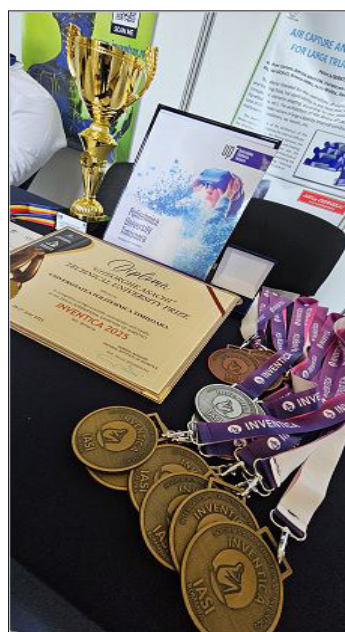
3rd Edition of the International Salon of Invention and Innovative Entrepreneurship, Chişinău, Moldova, 6-7 June 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The invention team of the Politehnica University Timisoara participated in the **International Salon of Invention and Innovative Entrepreneurship**, the third edition, held in Chisinau between June 6-7, 2025, organized by the Institute for Research, Innovation and Technology Transfer of the State Pedagogical University "Ion Creangă" in Chisinau, and presented a number of **seven inventions and projects**.
- The exhibition promotes the inventions, published scientific literature (books) of authors (individuals or legal entities), from the country and abroad, interested in making their results known to the general public.
- The areas of the International Salon of Invention and Innovative Entrepreneurship include: Inventions, Implementation of Research Results in Practice, Book Exhibition, Innovative Entrepreneurship.
- Following the international judging, the invention team of CITT UPT coordinated by **Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ** won a total of **ten awards**, as follows: **seven gold medals** and **three special prizes**.



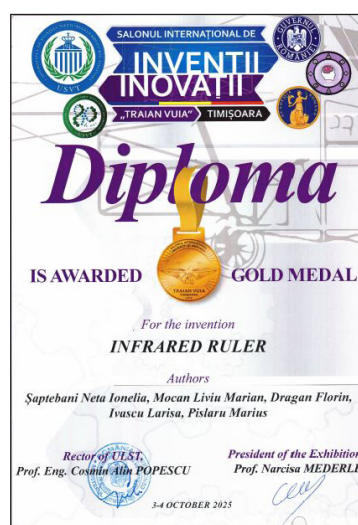
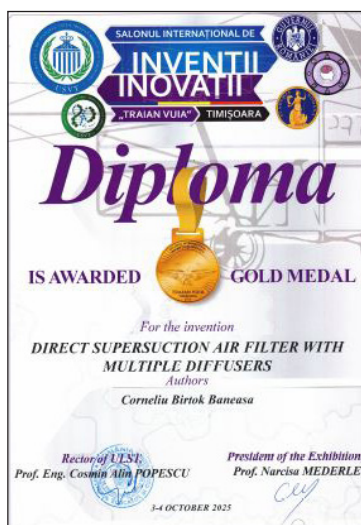
29th Edition of the International Exhibition of Inventics "Inventica 2025", Iasi, 25-27 June 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The invention team of the Politehnica University Timisoara participated in the **International Exhibition of Inventics "INVENTICA 2025", the XXIXth edition**, held in Iasi between June 25 – 27, 2025, organized by the "Gheorghe Asachi" Technical University of Iasi and the National Institute of Invention Iasi, presenting a number of **11 inventions and projects**.
- The **INVENTICA 2025 Exhibition** aims to bring together universities, research institutes, companies, associations, inventors and people interested in the field of invention, while offering an important opportunity to communicate and disseminate the results of the research activity to potential users and the general public.
- Following the international judging, the CITT UPT invention team coordinated by **Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ** won a total of **16 awards**, as follows: **5 gold medals, 3 silver medals, 3 bronze medals, 3 special prizes and 2 diplomas of excellence**, results that confirm the **high level of research and innovation activities** carried out within the institution.



11th edition of International Exhibition of Inventions and Innovations "Traian Vuia" Timișoara, Romania, 3 - 4 October 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The team of the Center for Innovation and Technology Transfer of the Politehnica University Timisoara, represented by Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ participated in the "Traian Vuia" International Exhibition of Inventions and Innovations Timișoara, the eleventh edition, held in Timișoara, between October 3–4, 2025.
- The invention team of the Politehnica University Timișoara (UPT) participated with four inventions/projects, which were evaluated by a national and international jury.
- Following the international judging, the invention team of the Politehnica University Timisoara obtained a total of **7 awards**, as follows:
4 gold medals, 1 special prize and 2 Diplomas of Excellence, results that confirm the high level of research and innovation activities carried out within the institution.
- The inventions were also included in the virtual catalog of the "Traian Vuia" International Exhibition of Inventions and Innovations, eleventh edition, published by Agroprint Publishing House, Timișoara, 2025, available online at:
<https://www.traianvuiaexpo.com/wp-content/uploads/2025/10/Catalog-Salon-Traian-Vuia-2025-1.pdf>



22nd Edition of the International Salon of Scientific Research, Innovation and Invention "PRO INVENT 2025" Cluj - Napoca, Romania, 15-17 October 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The invention team of the Politehnica University Timisoara participated in the **International Exhibition of Scientific Research, Innovation and Invention PRO INVENT**, XXII edition, held in Cluj Napoca between October 15–17, 2025, organized by the Technical University of Cluj Napoca (UTCN), and presented a number of **eleven inventions and projects**.
- **PRO INVENT** is a reference event, which for over two decades has brought together inventors, entrepreneurs, representatives of the academic environment and technology enthusiasts, offering a framework for presenting and valuing the results of research and innovation.
- Following the international judging, the invention team of CITT UPT, coordinated by **Lecturer Dr. Eng. Corneliu BIRTOK-BĂNEASĂ**, obtained a total of **18 awards: eleven gold medals, six special prizes and a Diploma of Excellence**, results that confirm the high level of research and innovation activities carried out within the institution.



- For more details, please visit the official PRO INVENT website: <https://proinvent.utcluj.ro/assets/docs/catalogs/2025.pdf>



2nd Edition of the International Innovation and Invention Show EUROPOLITEHNICUS 2025, Bucharest, Romania, 21-23 November 2025 Multiple Medals and Awards for Politehnica University Timisoara

- The invention team of the Politehnica University Timisoara participated in the second edition of the **EUROPOLITEHNICUS Invention Fair**, organized by the Polytechnic University of Bucharest, between November 21-23, 2025.
- The aim of **EUROPOLITEHNICUS** is to present, disseminate and promote the results of scientific research and technological development, to highlight achievements and current level of development in almost all areas of everyday life, as well as to increase the visibility of inventors' contributions to the international scientific heritage.
- The Politehnica University Timisoara was represented by the coordinator of the team, **Lecturer Dr. Eng. Corneliu BIRTOK BĂNEASĂ**, participating with **two inventions/projects**.
- Following the international judging, the invention team obtained a total number of **four awards**, as follows: **two gold medals, a special prize and a Diploma of Excellence**, results that confirm **the high level of research and innovation activities** carried out within the institution.



NATIONAL RESEARCH PROJECTS

BIO-INSPIRED STRUCTURES FOR BETTER INTEGRITY AND DURABILITY (BIS-BID)

Goal of the project

- The excellent mechanical properties of natural biomaterials have attracted intense attention regarding the strengthening and toughening mechanisms. Natural systems are made of a wide range of composite functional materials that are able to develop themselves to best fulfil the necessities of long-term survival in specific and sometimes, harsh conditions.
- Learning by Nature, translating and formalizing this knowledge to mathematical/mechanics/physics models is a virtuous path that can open completely new horizons in structural design revolutionizing the current state of the art making a jump up to now impossible to do.
- The project will induce a paradigm shift in the way we think of fatigue design, by fully exploiting biomimetic and bio-inspiration as a driving force in the design process. A new and low-cost approach will be developed for designing smart optimized structures ideally fatigueless. The aim of the project will be to improve the design of the components for improved integrity and durability.
- The focus will be in reducing the Stress Concentration Factor combining experiments with numerical simulations on solutions inspired from Nature.

Short description of the project

- The project will induce a paradigm shift in the way we think of fatigue design, by fully exploiting biomimetic and bio-inspiration as a driving force in the design process (main scientific objective).
- A new and low-cost approach will be developed for designing smart optimized structures ideally fatigueless (engineering objective).

Project implemented by

• **Coordinator:** Politehnica University Timisoara

Implementation period

03.01.2025 – 31.12.2027

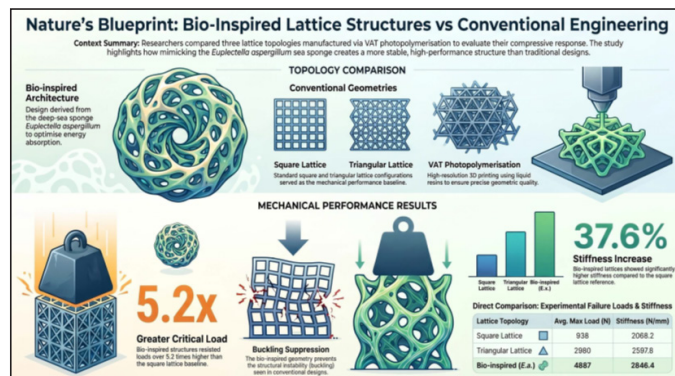
Main activities

1. *Learning by Nature: optimization of structural integrity with testing and modelling*
 - State of the art on learning by Nature
 - Identification of optimized natural structures able to bear cyclic loading
2. *Understanding and transferring the knowledge to mathematical, physical and mechanical models*
 - Application of the strain energy based approaches
 - Stochastic analyses to find correlation between structural properties at different scale levels in natural objects

Results

• *Main results were published in high impact journals:*

1. M. Marghitas, C.-F. Popa, L. Marsavina, On the Size and Notch Effect in AM Photo-Polymerized Components, *Fatigue and Fracture of Engineering Materials and Structures*, 48(9), 3790-3804, 2025, <https://doi.org/10.1111/ffe.70001>
2. E. Linul, New insights into tailoring anisotropy-driven shell design for enhanced compression performance in additively manufactured structures, *Progress in Additive Manufacturing*, 1–16, 2025, <https://doi.org/10.1007/s40964-025-01394-w>
3. C. Öhl, E. Linul, Microstructure-property-performance relationships in the orientation-driven vibrational behavior of LPBF AlSi10Mg specimens, *Journal of Materials Research and Technology*, 39, 8035-8048, 2025, <https://doi.org/10.1016/j.jmrt.2025.11.137>
4. C. Vălean, S.V. Galațanu, N.A. Sirbu, E. Linul, The scale effect of FFF-printed Polylactic Acid parts under quasi-static compression, *Proceedings of the Romanian Academy, Series A*, 26 (3), 2025, 269–275, [Doi: 10.59277/Pra-Ser.A.26.3.07](https://doi.org/10.59277/Pra-Ser.A.26.3.07) and presented at the prestigious conferences:
5. C. Sosdean, S. Piçarra, S.-V. Galațanu, L. Marsavina, Tensile Behavior of Romanian 'Țurcana' sheep wool waste-fibers: Influence of Body region, *International Conference of Engineering Against Failure (ICEAF) Kalamata, Greece*, 22 – 25 June 2025
6. S.-V. Galațanu, V. T. Popi, C.-F. Popa, L. Marsavina, Bending behavior of the 95% and 99% Alumina Ceramics, *International Conference of Engineering Against Failure (ICEAF), Kalamata, Greece*, 22 – 25 June 2025



7. L. Marsavina, M. Marghitas, D. D'Andrea, D. Santonocito, G. Risitano, Bio-inspired structures for energy efficiency, IGF-MedFract 3 Conference, Catania, Italy, 15-18 September 2025

8. C.F. Popa, S.V. Galațanu, L. Marșavina, O. Pop, Effect of Raster orientation and notch insertion on fracture toughness of PETG, 1st Biennial ESIS-CSIC Conference on Structural Integrity (BECCSI 2025), Belgrade, Serbia, 25-28 November 2025

Financed through/by

- Ministry of Research, Innovation and Digitization, CNCS-UEFISCDI, project number PN-IV-P1-PCE-2023-1446, within PNCDI IV

Research Center

- "Ștefan Nădășan" Research Laboratory for Strength, Integrity and Durability of Materials, Structures and Conductors

<https://eertis.eu/errf-2300-000y-1525>

Research Team

Project leader:

- Prof. Dr. Eng. Liviu MARSAVINA

Researchers:

- Prof. Dr. Eng. Filippo BERTO
- Prof. Dr. Eng. Calin POPA
- Prof. Dr. Eng. Dan Andrei SERBAN
- Prof. Dr. Eng. Emanoil LINUL
- Assoc. Prof. Dr. Eng. Radu Marcel NEGRU
- Assoc. Prof. Dr. Eng. Dan Ioan STOIA
- Assoc. Prof. Dr. Eng. Sergiu Valentin GALATANU
- Lecturer Dr. Eng. Cosmin MARSAVINA
- PhD Student Eng. Mihai Petru MARGITAS
- PhD Student Eng. Cosmin Florin POPA

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Project Website: <https://www.bis-bid.com/>

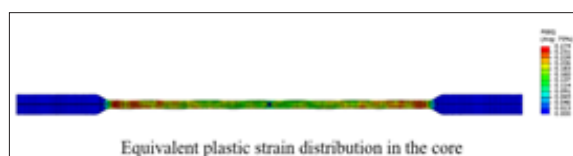
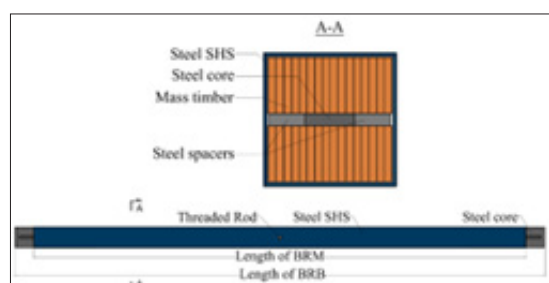
STAINLESS STEEL BUCKLING RESTRAINED BRACES FOR SEISMIC-RESISTANT RE-CENTRING FRAMES (RECENT)

Goal of the project

- The project aims at developing a design process for an innovative damage-tolerant structural system, i.e. a structure where damage experienced during a severe earthquake can be easily repaired, with application to buckling restrained braced frames, and by demonstrating experimentally the feasibility of an innovative, high-ductility “dry” buckling restrained brace (BRB) with stainless steel core.

Short description of the project

- Earthquakes can cause severe damage and economic losses, even in structures designed to modern seismic standards, highlighting the need for improved ductility and post-earthquake performance.
- A novel dry BRB with timber filler is investigated through finite element analysis and experimental testing, considering mild carbon steel and stainless steel cores, the latter aiming to enhance ductility and fatigue life.
- A simplified code-compatible design procedure for re-centring dual BRB frames is developed and validated through nonlinear analyses.



Project implemented by

- **Coordinator:**
Politehnica University Timisoara
- **Partners:**
Zubic Design SRL

Implementation period

11.02.2025 – 31.12.2026

Main activities

- Development of monotonic and cyclic constitutive models for mild carbon steel and stainless steel
- Preliminary design and FEM-based development of “dry” buckling-restrained braces with a mild steel core
- Preliminary design and FEM-based development of “dry” buckling-restrained braces with a stainless steel core
- Design and fabrication of specimens for base material testing
- Preparation of execution drawings and fabrication of the experimental setup and BRBs
- Tensile and low-cycle fatigue tests on base materials

Results

- Monotonic and cyclic constitutive models were developed for mild carbon steel and stainless steel.
- For each base material, tensile, Charpy, and low-cycle fatigue tests were performed and used to calibrate the material models.
- A preliminary design and FEM-based development of “dry” BRBs was carried out for configurations with mild steel and stainless steel core.
- Numerical analyses were conducted to assess the seismic performance of the proposed solution.
- Execution drawings were prepared, followed by fabrication of the experimental setup, the hybrid steel–timber and conventional concrete BRB prototypes.

Applicability and transferability of the results

- The detailed numerical investigation allowed the identification of key parameters governing the performance of the proposed dry buckling-restrained brace
- The results highlighted the critical role of the mechanical properties and orientation of the timber filler, as well as the gap dimensions and steel tube characteristics
- While the proposed system shows potential for sustainable and reusable BRB solutions, its applicability requires strict control of fabrication tolerances, as the very small gap between the timber filler and the steel tube makes assembly demanding
- With appropriate technological refinement and quality control, the proposed dry steel–timber BRB can be transferred to practical applications after experimental validation

Financed through/by

- This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CCCDI – UEFISCDI, project number PN-IV-P7-7.1-PED-2024-2524, within PNCDI IV.

Research Center

- The Research Centre for Mechanics of Materials and Structural Safety (CEMSIG)

Research Team

Project leader:

- Prof. Dr. Eng. Aurel STRATAN

Researcher:

- PhD Student Eng. Dara-Dragana IOSIM

Contact information

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Project Website: www.ct.upt.ro/centre/cecmsig/recent.htm

PROCEDURE FOR RAPID PERFORMANCE OPTIMIZATION OF STRUCTURES WITH ADVANCED SEISMIC PROTECTION SYSTEMS (DAMPRO)

Goal of the project

- The project aims to develop performance-based design processes for advanced structural systems that employ modern seismic protection technologies, by: development of a software tool for the rapid assessment of the performance of advanced seismic protection systems, development of pre-selection matrices using multi-criteria (structural and non-structural) performance and development of technical data sheets for structures equipped with advanced seismic protection systems.

Short description of the project

- Seismic design codes primarily ensure life safety, often neglecting structural and nonstructural damage, leading to major material losses.
- This project develops performance-based design methods and a rapid evaluation software tool for advanced seismic protection systems, enabling efficient, cost-effective solutions that enhance seismic resilience and reduce earthquake-induced damage.

Project implemented by

Coordinator:

Popp & Asociații

Partners:

Politehnica University Timișoara

Implementation period

08.01.2025 – 31.12.2026

Main activities

- Selection of structural archetypes
- Identification of performance criteria
- Selection of design seismic action parameters and generation of accelerograms
- Development of simplified design procedures
- Initial design of structural archetypes using simplified procedures
- Final design of structural archetypes using advanced methods
- Preparation of the design sheet for structures with base isolation systems
- Development of equivalent SDOF models for structural archetypes

Results

- 12 structural archetypes were defined (medium- and high-rise, 2 seismic hazard zones, 3 structural systems: moment-resisting steel frames, concentrically braced steel frames, and reinforced concrete shear wall structures)
- Relevant performance criteria were established (overall structural response, protection of non-structural elements, and post-earthquake functionality requirements)
- Design seismic action parameters were defined
- Simplified design procedures were formulated
- The 12 archetypes were designed and then evaluated using advanced analysis methods
- A design data sheet was prepared for base isolation systems, intended for subsequent use in the project
- Simplified SDOF equivalent models were developed for the considered archetypes

Applicability and transferability of the results

- The results will be used to streamline the design process and identify economically viable advanced solutions.
- By combining the expertise of P&A and UPT, the project seeks to address the technical complexities of the design process, ensuring the deployment of reliable, cost-effective seismic protection solutions
- The outcomes are expected to significantly enhance building safety and sustainability in seismic events
- Simplified SDOF equivalent models will be used in the next stage of the project for extensive parametric analyses and for applying the proposed rapid optimization procedure

Financed through/by

- This project was supported by a grant of the Ministry of Research (MEC), Innovation and Digitization, CCCDI - UEFISCDI, project number PN-IV-P7-7.1-PTE-2024-0624, within PNCDI IV.

Research Center

The Research Center for Mechanics of Materials and Structural Safety – CEMSIG

Research Team

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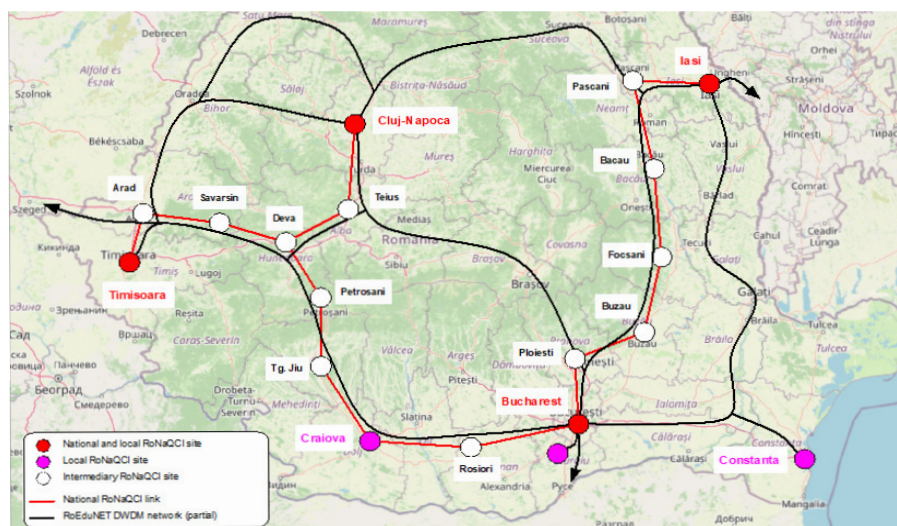
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ROMANIAN NATIONAL QUANTUM COMMUNICATION INFRASTRUCTURE

Goal of the project

• **RoNaQCI** has built a 1,500km+ quantum communication infrastructure (QCI) network across Romania, including six metropolitan networks in major cities (Bucharest, Iași, Cluj-Napoca, Timișoara, Craiova, and Constanța). It connects 10 universities, 5 research institutes, 5 public bodies, 3 data centers, and a medical clinic, using 36 Quantum Key Distribution (QKD) links. The project also focused on quantum technology education, security software development, and industry collaboration while preparing for future quantum internet expansion.



Short description of the project

• **RoNaQCI** deploys a 1,500km+ quantum communication network across Romania, linking key cities and institutions.

Implementation period

January 1, 2023 – June 30, 2025

Project implemented by

• **Coordinator:** Politehnica University of Bucharest
 • **Partners:** Gheorghe Asachi Technical University of Iași (TULasi), Alexandru Ioan Cuza University of Iași (UAIC), **Politehnica University Timișoara (UPT)**, West University of Timișoara (UVT), Babeș-Bolyai University (UBB), Technical University of Cluj-Napoca (UTC-N), University of Bucharest (UB), University of Craiova (UCv), Dunărea de Jos University of Galați (UGAL), Lucian Blaga University of Sibiu (ULBS), Maritime University of Constanța (CMU), National Institute for Research and Development in Physics and Nuclear Engineering – Horia Hulubei (IFIN-HH), National Institute for Research and Development in Laser, Plasma, and Radiation Physics (INFLPR), National Institute for Research and Development in Isotopic and Molecular Technologies (INCDTIM), National Institute for Research and Development in Materials Physics (INCDFM), Institute for Advanced Technologies (ITA), Institute of Space Science (ISS), Romanian Space Agency (ROSA), Ministry of National Defense (METRA), National Agency for Information Network Management for Education and Research (RoEduNet), Trencadis Corp SRL (TRC), Intergraph Computer Services SRL (ICS), Trans Sped SA (TSP).

Main activities

- In addition to the 1,500km quantum network with 36 QKD links, RoNaQCI developed quantum security protocols, open-source QCI monitoring software, and secure VPNs
- The project tested 15 metropolitan applications and national use cases in medical, financial, public, and defense sectors. A national QCT certification was created, alongside training programs for academia, industry, and government
- Collaboration with ISPs, security institutions, and stakeholders ensures compliance with EU standards and drives quantum Internet expansion

Results

- UPT coordinates **WP7 – Advanced Use Cases**, which focuses on developing and deploying quantum-secure applications within **RoNaQCI**. To this end, UPT integrated QRNG devices into X.509 certificate generation
- The UPT team also contributed to the implementation of the open-source QCI monitoring software, QKD-based VPN and QKD-based SSH. The UPT team also founded the UPT Quantum Educational Hub and held Basic Quantum Knowledge trainings for students

Applicability and transferability of the results

- **RoNaQCI** enhances cybersecurity, healthcare, finance, public services, and cloud computing through quantum-secured communication. It strengthens data protection for governments, banks, ISPs, and research institutions while enabling secure medical and financial transactions
- The project is scalable across Europe, supports cross-border quantum networks and fosters industrial adoption. Its training programs and certification models can be replicated in other countries, ensuring long-term impact in quantum technology education and workforce development

Financed through/by

- European Commission
(101091562 - RoNaQCI – Digital – 2021-QCI-01), UEFISCDI
(PN-IV-P8-8.2-EUD-2024-0018, 7 EUD/2024 RoNaQCI)

Research Center

- Research Center for Computers and Information Technology

Research Team

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FINANCE AND CLIMATE CHANGE: INVESTIGATING THE INTERCONNECTION AMONG ENERGY PRICES, GREEN FINANCE, EMISSIONS AND MONETARY POLICY

Goal of the project

- The purpose of the present research project is to investigate the interconnection among energy prices, green finance, carbon emissions and monetary policy, on three research directions.
- The first direction relates to the asymmetrical impact of green finance on climate change.
- The second direction addresses the complex interconnections between energy prices and green bonds, based on network analyses.
- The third direction investigates the monetary policy response to climate change.

Short description of the project

- The project aims to empirically investigate the environmental impact of energy price, green finance and monetary policy.

Project implemented by

- Politehnica University Timisoara

Implementation period

01.01.2025-31.12.2027

Main activities

- The climate crisis represents a global phenomenon, being connected with the financial system
- On the one hand, the financial system contributes to climate change if it carries on with financing polluting activities
- On the other hand, the negative effects of climate change impact the financial activities
- This evidence shows that climate and financial goals should be aligned. Investigating the environmental impact of energy price, green finance and monetary policy, implies:
 - a) Literature review and data collection
 - b) Econometric analyses and discussions on empirical results
 - c) Dissemination of results in conferences and high-ranked journals.

Results

- a) 5 papers in ISI journals:
 - Albulescu, C.T., Ajmi, A.N., Miclea, S., Cernescu, L.M. (2025). Total factor productivity and firm size in the German energy industry: evidence from a symbolic transfer entropy panel causality test, *Journal of Applied Economics*, 28(1), 2453253
 - Mutascu, M. (2025). Beyond the EKC: Economic development and environmental degradation in the US, *Ecological Economics*, 232, 108567

- Strango, C., Mutascu, M. (2025). Beyond the Buzz: Electric cars and the German health public budget, *Journal of Transport & Health*, 43, 102076
- Mutascu, M., Nicolescu, A.-C. (2025). Operating financial sustainability in the German car industry: a new approach, *Transport Policy*, 173, 103791
- Albulescu, C.T. (2024). Total factor productivity and tax avoidance: An asymmetric micro-data analysis for European oil and gas companies, *Economics of Energy and Environmental Policy*, 13(2), 107-129
- b) 1 paper in BDI journals:
 - Strango, C., Mutascu, M., Hegerty, S.W. (2025). Does English proficiency promote international trade? *International Economics*, 183, 100628
- c) 3 data repositories:
 - EEEP - Total factor productivity and tax avoidance (Identifier: DOI 10.17605/OSF.IO/N4TM3)
 - JAE -Total factor productivity and firm size in the German energy industry: evidence from a symbolic transfer entropy panel causality test (Identifier: DOI 10.17605/OSF.IO/QEWJ8)
 - JTH - Beyond the Buzz Electric cars and the German health public budget (Identifier: DOI 10.17605/OSF.IO/5VS2M)
- d) 4 conference participations:
 - TIMTED 2025 - Current Economic Trends in Emerging and Developing Countries, West University of Timisoara, Timisoara, 22-24 May 2025
 - IRMBAM25 - The 14th International Research Meeting in Business and Management, IPAG Business School, Nice, France, 3-4 July 2025
 - The 27th INFER Annual Conference, Sapienza Università di Roma, Rome, Italy, 10-12 September, 2025

• **SIM 2025 - 18th International Symposium in Management**
(Optimizing the Future: Management Innovation for a Sustainable World), West University of Timisoara & Politehnica University Timisoara, Timisoara, 24-25 October 2025

e) **1 research stage** University Cote d'Azur

Applicability and transferability of the results

- The results of the project have noteworthy implications for policymakers
- National and international regulators and policymakers receive information about the impact of shocks in energy prices on carbon emissions, but also about the effectiveness of green finance in controlling carbon emissions
- Finally, the project aims to optimize the monetary policy reactions to environmental changes

Financed through/by

Executive Unit for Financing Higher Education, Research, Development and Innovation – UEFISCDI

Research Center

- Research Center for Engineering and Management

Research Team

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- Researchers:

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- Prof. Dr. Eugenia GRECU
- Assist. Prof. Dr. Maria Elena BOATCĂ-BARABAȘ
- Assist. Prof. Dr. Rebecca CHINCEA
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MONITORING ALGAL BLOOMS AGGRAVATED BY EUTROPHIC POLLUTION AND CLIMATE WARMING IN ECOSYSTEMS IN THE DANUBE DELTA

Goal of the project

- Project goal

Modernization and integration of technical capacities between Romania and the Republic of Moldova for monitoring severe algal blooms and their effects on aquatic biodiversity.

- Overall objective of the project

Development of a unified innovative monitoring system for aquatic ecosystems, acquisition of essential data for mapping severe algal blooms and predicting the hazards arising from these phenomena in the lower Danube river basin.

Short description of the project

- Development of an aquatic ecosystem monitoring system for deciphering algal blooms in the Danube River region.

Project implemented by

- **Coordinator:** Politehnica University Timisoara

Partner 1: Moldova State University

Implementation period

01.09.2025 - 31.08.2026

Main activities

1. Development of an innovative system for monitoring aquatic ecosystems and sustainable monitoring of ecological transformations in the Danube River region caused by algal blooms
2. Familiarization with the algal bloom monitoring system, using Copernicus satellites, as well as the use of electrochemical sensors and remote data processing
3. Expeditions for hydrobiological investigations during and after algal blooms
4. Hydrobiological measurements
5. Hydrochemical measurements of pollution, weather and effects of algal blooms
6. Establishment of an algal bloom monitoring center with access to European information systems and development of new scripts for recalibrating satellite data to real measurements
7. Production of a "Manual for remote monitoring of algal blooms"

Results

- The activities and results of the first stage (2025) were related to the design of instruments for direct monitoring of algal blooms in the field and the dissemination of research results.

Specific objectives of Stage I:

- A. Design of the SPEAR-64 equipment (a combination of two instruments called SPEAR-sediment- 32x32x32 and SPEAR-plankton-32x32x32);
- B. Design of the ECOLAB instrument;
- C. Initiation of direct collaboration between the two partners of the **ALGA-MONITOR project** (CO - P1) through the active participation of postdoctoral students from the Republic of Moldova in the design activities of the instruments for monitoring algal blooms; and
- D. Direct collaboration of the two partners (CO - P1) through the holding of working meetings and the dissemination of research results.

Applicability and transferability of the results

- The two partners of the **ALGA-MONITOR** project have successfully designed the instruments for direct monitoring of algal blooms.
- Thus, they collaborated to achieve the objectives of the 2025 stage, the activities of the 2 partners being complementary, each partner benefiting from the knowledge and experience of the other.
- In this way, the successful design of the instruments was achieved:
 - SPEAR-sediment-32x32x32,
 - SPEAR-plankton-32x32x32 and
 - ECOLAB.
- The dissemination of the results was also successfully achieved through the publication of an ISI article, participation in a conference and participation in two salons, one for invention and the other for technology transfer.
- Thus, the project implementation plan was respected and even exceeded. In the next stage, the construction of the designed instruments, field testing, satellite analyses of algal blooms and field and laboratory analyses will be carried out.

Financed through/by

- **Contracting Authority:** Executive Unit for Financing Higher Education, Research, Development and Innovation (UEFISCDI)
- **Name of the Program** in PN IV: Program 5.8 - European and International Cooperation
- **Project Type:** Complex Bilateral Projects with the Republic of Moldova
- Project:** PN-IV-PCB-RO-MD-2024-0152,
- Acronym:** ALGA-MONITOR
- Funding Contract** No. 17PCBROMD / 2025

Research Center

- Research Center for Hydrotechnics and Environmental Protection

Research Team

Project leader

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Researchers

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DESIGNING SECURITY FOR EMERGING IN-VEHICLE NETWORK PARADIGMS

Goal of the project

- The project focuses on the integration of security mechanisms in the architecture of future in-vehicle networks, based on threat analysis and risk assessment as well as the design of specific solutions for in-vehicle intrusion detection, secure over-the-air updates and security solutions for emerging automotive communication technologies, to address threats introduced by the adoption of these new in-vehicle networking paradigms.

Short description of the project

- Integrating security and designing of security mechanisms for emerging in-vehicle network architectures.

Project implemented by

- **Coordinator:** Politehnica University Timisoara

Implementation period

11/08/2025 - 10/08/2027

Main activities

- A zone-oriented centralized in-vehicle architecture use case was defined and the main network node types were identified and characterized.
- Considering the system knowledge available in the concept phase of the project development, a separate threat analysis and risk assessment (TARA) was performed for each of these main node types, following the steps defined in ISO/SAE 21434.
- Data communication, firmware and data were targeted in the analysis as common assets of base node types along with node-specific assets. The main goal was the identification of main threat categories along with corresponding attack paths, impact and feasibility for each node type as well as the determination of associated risk levels as a preliminary step in defining and integrating appropriate security mechanisms.

Results

- The results of our threat analysis and vulnerability assessment illustrate that each type network node type is exposed to a variety of attacks, mostly dependent on the node functionality and interfaces. As expected, nodes equipped with a wide variety of wired and wireless interfaces, such as the Telematics Control Unit, are exposed to a wider range of attacks.
- The safety, financial, operational and privacy related impact of attacks is strongly related to the specific functions implemented by each targeted node.
- The overall risk values indicate slightly higher risk levels for attacks performed over wireless communication interfaces which provide a virtually unlimited window of opportunity and do not require physical vehicle access.

Applicability and transferability of the results

- Results of performing threat analysis and risk assessment in the concept level of vehicle network development provides sufficient detail for the definition and integration of security controls which is the next phase of our project.
- The granularity of TARA can be increased during the vehicle development life cycle as concrete features for each network component are clearly defined and implemented.
- This can lead to further enhancements of the defined security controls making the strengthening of the vehicle security architecture an ongoing process which continues past the vehicle production date.

Financed through/by

UEFISCDI

Research Center

- Research Center for Automatic Systems Engineering
- <https://eertis.eu/errf-2300-000v-1356>
- <https://www.aut.upt.ro/centru-cercetare/index.EN.php>

Research Team

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SMART POWER FLOW BALANCING SYSTEM IN THREE-PHASE DISTRIBUTION NETWORKS WITH HIGH CONCENTRATIONS OF SINGLE-PHASE PROSUMERS

Goal of the project

- Raising the level of technological readiness of an innovative system, based on intelligent automatic capacitive balancing compensators, capable of balancing the two-way power flow in three-phase distribution networks with high concentrations of single-phase prosumers.
- The innovative system will include original scientific and technological solutions and is proposed as a solution to a problem that can be associated with one of the priority societal challenges included in the Strategic Research Agenda of Romania: Modernization of energy transmission and distribution networks.

Short description of the project

- The project aims to build an experimental model of a system consisting of automatic unbalanced capacitive compensators.

Project implemented by

• Coordinator:

Politehnica University Timișoara,
Electrical Power Engineering Department;

• Partners:

- ICPE ACTEL S.A. Bucharest

- 5. Installation of primary electrical circuits, commissioning, and testing of photovoltaic systems;
- 6. Installation of balancing capacitive compensators;
- 7. Installation of the data acquisition and measurement system;

Results

- During **Stage 1 (2025)** of the project, applied research continued and progressed.
- Analytical studies and laboratory-scale experiments physically validated the predictions regarding the operation of certain individual components of the technology - the capacitive balancing compensators.
- The experimental work yielded results confirming that these elements function as expected, specifically their essential function of balancing power flow.
- The following deliverables were produced:
 1. Matlab simulation studies of the model's operating modes;
 2. Technical design of the photovoltaic system;
 3. Technical design of the measurement system;
 4. Project website.

Implementation period

Stage 1: 08/01/2025...31/12/2025

Stage 2: 01/01/2026...31/12/2026

Main activities

Stage 1/2025 - Design and construction of the model:

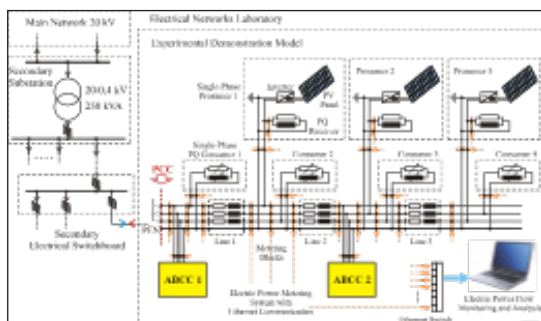
- 1. Simulation studies of the model's operating modes to determine its functional limits by correlating them with the technical characteristics of the basic components;
- 2. Design of photovoltaic systems;
- 3. Design of measurement, monitoring, and analysis systems;
- 4. Installation of photovoltaic systems;

Applicability and transferability of the results

- The societal partner participated in the activities and supported the increase in technological readiness level of the solution, with a view to future technology transfer.

Financed through/by

- Government of Romania, Ministry of National Education, Executive Unit for the Funding of Higher Education, Research, Development, and Innovation (UEFISCDI);
- National Plan for Research, Development, and Innovation 2022 – 2027 (PNCDI IV);
- Program 5.7. – Partnerships for Innovation;
- Subprogram 5.7.1. – Partnerships for Competitiveness;
- Funding instrument: Experimental Demonstration Project (PED);
- Funding instrument identifier: PN-IV-INO-PED-2024-1;
- Project code: PN-IV-P7-7.1-PED-2024-1568;
- Grant Contract No.: 57PED/10.02.2025;



Research Center

- Research Center for Power Systems Analysis and Optimization

Research Team

Project leader:

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ACCELERATED CARBONATION OF CONCRETES PRODUCED WITH RECYCLED MATERIALS AND BIOMASS ASH – MOBILITY EXCHANGES PROJECT: ROMANIA – BELGIUM, WALLONIA REGION

Goal of the project

- The project for mobility exchanges of academic staff that main goal was to contribute at the development of new concretes. The recycling of masonry and concrete waste, in particular fine particles from shredding, for use in the manufacture of concrete or precast elements, is hampered by the intrinsic characteristics of aggregates (in particular their porosity) but also by traditional methods of implementation.
- Similarly, fly ash from biomass burning, which is becoming increasingly common, currently finds few uses. The cooperation project aims to develop environmentally friendly concrete compositions that recover recycled fine particles and biomass ash and aims to meet several objectives:
 - Significant reductions in greenhouse gas emissions;
 - Reduction in energy consumption;
 - The protection of natural resources, to which access is becoming increasingly limited;
 - Recovery of deconstruction materials and ash to limit or even eliminate waste landfilling.

Short description of the project

Project for mobility exchanges of academic staff that aims to contribute to the development of new concretes obtained by:

- Replacement of some of the cement-based constituents with fly ash obtained from biomass combustion;
- Replacing classic aggregates with those obtained from recycled concrete.
- Accelerated carbonation of constituents and final mix will improve the mechanical and physical performance of prefabricated products.
- These different operations will make it possible to save natural resources by recovering secondary resources and limiting the impact of these materials on climate change by reducing CO₂ emissions.

Project implemented by

- **Romanian Coordinator:**
Politehnica University Timisoara
- **Belgian Coordinator:**
University of Liège

Implementation period

Jan. 2025- Dec. 2025

Main activities

- **Visit of Prof. Dr. Eng. Luc COURARD from University of Liège, in Timișoara, Feb. 2025:**
 - Presentation “Recycling in the Built Environment: Challenges and Techniques for Engineers” – for Master students in Construction Rehabilitation and Sustainable Development;
 - Presentation of the research activities carried out in the UEE Building Materials group and possibilities of cooperation.



Fig. 1. Visit of Prof. Dr. Eng. Sorin DAN at the University of Liège, Sep. 2025



Fig. 2. Visit of Prof. Dr. Eng. Luc COURARD at Politehnica University Timisoara, Nov. 2025

Results

Scientific and technical description of the results and the degree of achievement of the objectives are:

- The consortium's partners in Romania and Wallonia-Belgium have a strong tradition of mutual collaboration, based on an in-depth knowledge of the production, characterization and valorization of alternative cement and concrete products, as well as the design and sustainability of cement-based products.

- The complementarity of the research partners makes it possible to cover the entire process: from the industrial by-product as a secondary raw material, new cement-based mixtures are designed and developed, thus saving natural resources, reducing CO₂ emissions and the volumes of construction waste to be landfilled at the end of their lifetime.
- The project contributes to the development of "green" binders and concretes obtained by replacing some of the cement-based constituents with fly ash obtained from biomass burning.
- Biomass fly ash cannot yet be used in cement for concrete production, as it is not yet allowed in EN 450-1 and EN 206.
- The project identifies the most promising ashes through a detailed characterization of their composition and pozzolanic character when mixed with cement and recycling fines.
- Based on the accelerated carbonation treatment and the properties obtained, the project provides public works companies with suitable products that meet a very wide range of properties in terms of strength development, leaching and durability (construction of roads and foundations).

Applicability and transferability of the results

- The partners aim to present their research results through publications of scientific articles at specialized conferences and in specialized Journals, at Elsevier Publishing House.
- They also aim at the completion of a dissertation by the Master's students and the involvement of doctoral students in the next co-operation projects.

Financed through/by

- UEFISCDI

Research Center

- Research Center for Rehabilitation of Constructions

Research Team

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ECONOMIC EFFICIENCY IN THE TRANSITION TO GREEN HYDROGEN – H2VOLT

Goal of the project

- The **H2VOLT project** aims to develop a pilot Power-to-Power module for green energy storage in hydrogen and electricity generation using a low-cost PEM fuel cell, by replacing the platinum catalyst with a high-voltage ionization system for gaseous reactants.
- The primary objective is to advance technological readiness from TRL4 to TRL6 in partnership with BEIA Consult International (CO) and ICSI Râmnicu Valcea (P2), contributing to clean energy integration and reduced dependence on rare metals.

Short description of the project

- **H2VOLT** pilot Power-to-Power module: green hydrogen storage and PEMFC power generation via high-voltage ionization (no Pt catalyst).

Project implemented by

- **Coordinator:** BEIA Consult International
- **Partner 1:**
- Politehnica University Timisoara (P1)
- **Partner 2**
- National R&D Institute for Cryogenic and Isotopic Technologies (ICSI) Râmnicu Vâlcea (P2)

Implementation period

09.07.2025 – 07.07.2027

Main activities

- **Stage 1** was focused on analysing the current state of the art and defining the H2VOLT pilot module architecture.
- Key activities included: identifying all system components (HV ionisation sources ~1 kV, PEM electrolyser 15–33 kW, PEMFC stack, DC/AC inverter, capacitor bank, H₂ storage, IoT sensor network);

- Mathematical modelling and MATLAB/Simulink simulation of the ionised vs. standard PEM cell configurations, demonstrating efficiency gains of +5–10 percentage points; Hardware-in-the-Loop validation on OPAL-RT; and freezing design specifications (converter sizing, EMC requirements, safety interlocks ≤100 ms).
- Results confirmed that HV pre-ionisation of gaseous reactants reduces activation losses and increases peak power output by ~7%, supporting progression to **Stage 2** prototype development.

Results

Results obtained in 2025:

- (1) Complete MATLAB/Simulink model of the H2VOLT module comparing standard PEM fuel cell (Regular Cell) versus ionized configuration (Ionized Cell).
- Polarization U–i curves demonstrate higher voltage at the same current density for the ionized configuration, with efficiency improvements of up to ~10 percentage points at moderate loads.
- (2) Model ported to OPAL-RT Hardware-in-the-Loop (HIL) platform, validating module behavior under load variations and current pulses.
- (3) Scientific paper in preparation: "Effect of Hydrogen Ionization on Fuel Cell Performance: Efficiency and Fuel Consumption" (Luchian, Ancuti et al.).

Applicability and transferability of the results

- The **H2VOLT module** is applicable in industrial, transport, public infrastructure, and residential sectors.
- The high-voltage ionization technology eliminates dependence on platinum catalysts, significantly reducing PEM fuel cell costs. Simulation results confirm that pre-ionizing hydrogen reduces activation losses and improves energy efficiency.
- Future investigations will focus on the experimental integration of the ionizer unit into the PEM stack, pilot-scale validation (TRL5 TRL6), and a feasibility study for industrial production of the **H2VOLT module**.
- The concept could extend to off-grid applications and green hydrogen economy use cases.

Financed through/by

UEFISCDI – Program PN-IV-INO-PTE-2024-1,
Contract no. 62PTE/2025, state budget funding

Research Center

Research Center for Smart Energy Conversion and Storage

Research Team

Project leader:

– Assoc. Prof. Dr. Eng. Mihaela-Codruta ANCUTI

Researchers:

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– Eng. Alin STINGU

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ENERGY-EFFICIENT WATER JET CONTROL FOR IMPROVING THE OPERATIONAL FLEXIBILITY OF HYDRAULIC TURBINES

Goal of the project

- The aim of the project is to design, develop, and experimentally analyze a new concept by using an actuator mounted at the tip of the hydraulic turbine rotor hub (ogive).
- The actuator will generate a radial-axial water jet within the draft tube cone of the hydraulic turbine.
- The hydraulic turbine, whose rotor ends with an ogive, will be equipped with an actuator that allows displacement and precise positioning.

Short description of the project

- The concept will consist of an electrical system (installed inside the ogive) used for the precise displacement and positioning of the actuator. Compared to the axial water jet control technique, already validated in laboratory conditions and hydropower plants, the radial-axial water jet actuator concept offers the following advantages:
 - (1) it reduces the required injection flow rate from 14% to 2%;
 - (2) due to its displacement system, it can generate axial, radial-axial, or radial jets, depending on the hydrodynamic instabilities developed within the draft tube cone.
- The main objective of the new actuator concept is to add operational flexibility to hydraulic turbines when operating at off-design conditions.

Project implemented by

- **Coordinator:** Politehnica University Timisoara
- **Partner:** BEESPEED Automatizari SRL

Implementation period

01.01.2025-31.12.2026

Main activities

1. Analysis of the flow in the conical diffuser. Identification of design parameters.
2. Mechanical and electrical design, and development of the actuator system.

Activities:

- Mechanical design of the actuator
- Manufacturing of actuator system components
- Assembly on the experimental test rig; preliminary testing
- Evaluation of flow performance using the actuator
- Assessment for industrial implementation



Fig. 1. View of the experimental setup



Fig. 2. Detail of the water jet injection and control system

Results

1. Patents:

- BOSIOC I.-A. et al., "Radial-axial water injection in hydraulic turbine diffusers", patent application A/00144/2025

2. International Conferences:

- BOSIOC I.-A. et al., "Efficient Radial-Axial Jet. . .", CMFF'25, Budapest, 2025
- SZAKAL R.A. et al., "Numerical Analysis of Swirling Flow Regimes. . .", CMFF'25, Budapest, 2025
- BOSIOC I.-A. et al., " Axial vs. Radial-Axial Water Jet. . .", ICNAAM 2025, Greece

3. Books:

- BOSIOC I.-A., SUSAN-RESIGA R., "Hydrodynamics of Decelerated Swirling Flows", Politehnica Publishing House, 2025

Applicability and transferability of the results

- The project benefits from the infrastructure of the Research Center for Complex Fluid Systems Engineering (CCISFC) within Politehnica University Timișoara, including the experimental test rig equipped with data acquisition and control systems, as well as equipment available on the platform

<https://eertis.eu/erio-2300-000w-4216>

- The partner in this project is **BeeSpeed Automatizări SRL** (<https://www.beespeed.ro>), a company with extensive experience in automation processes, which has implemented numerous projects over the years, particularly in the field of hydromechanical automation.

- During the project implementation, this method will be thoroughly analyzed on the experimental test rig at UPT, where the measurements are scheduled to be carried out.

Financed through/by

- UEFISCDI

Research Center

Research Center for Complex Fluid Systems Engineering

Research Team

Project leader:

- Assoc. Prof. Dr. Eng. Alin Ilie BOSIOC

Researchers:

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- Prof. Dr. Eng. Adrian STUPARU

- Assoc. Prof. Dr. Eng. George BELGIU

- Assoc. Prof. Dr. Eng. Alin ANTON

- Dr. Eng. Constantin TĂNASĂ

- Dr. Eng. Raul SZAKAL

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ADJUSTABLE IRIS TO CONTROL SELF-INDUCED INSTABILITIES GENERATED BY THE SWIRLING FLOW FROM THE CONICAL DIFFUSER OF HYDRAULIC TURBINES – IRIS

Goal of the project

- The goal of the project is to demonstrate and validate on the experimental test rig the operation of a new device (IRiS) to control the self-induced instabilities generated by the swirling flow from the conical diffuser of hydraulic turbines that operates far from their optimum efficiency point (at partial load), Fig.1.
- In fact, IRiS will allow the swirling flows control, involving a progressive throttling cross section flow at the outlet of the conical diffuser - Fig.2.

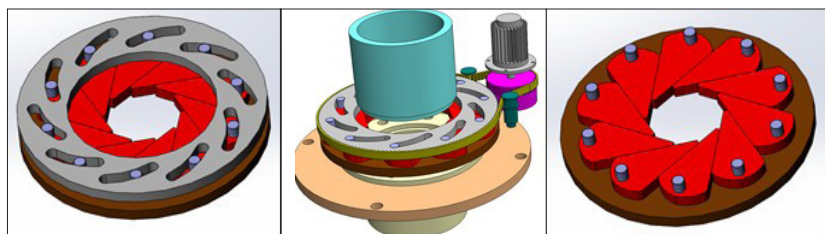


Fig. 1. Sketch of the IRiS device

Short description of the project

- Hydraulic turbomachines can experience severe pressure fluctuations when operated below their design conditions. Hydrodynamic instabilities generate severe pressure fluctuations in the conical diffuser.
- These pressure oscillations vary in amplitude and frequency depending on the operating point. The causes of these fluctuation changes are e.g. at part load in the 60% flow range, pressure pulsations induced by the helical vortex (or vortex rope).
- These phenomena have been known for a long time, but their effects are felt more acutely today. The entire academic community and design engineers recognize that the problem of far-from-optimal regimes is still open and await effective technical solutions that can be implemented in hydropower plants to substantially improve flexibility in hydropower exploitation.
- The rope vortex phenomenon is associated with severe vibrations and pressure pulsations. It can excite all parts of the hydraulic and structural system, leading to serious problems such as: pressure fluctuations, fatigue effects, vibrations, power oscillations, noise. In this way, the main goal of the project is to execute, implement and test an innovative solution by using a new adjustable / retractable diaphragm device (IRiS – Fig. 1), which involves progressive throttling of the cross-section area at the outlet of the conical diffuser to control the decelerated swirling flow with vortex rope from the conical diffuser of hydraulic turbines – with fixed blades as Francis turbine.

- Today, the challenge is to find a control technique (and this is the purpose of this research project), which does not introduce and does not produce disadvantages such as those listed in Table 1.

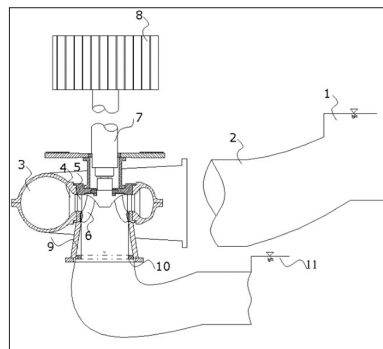


Fig. 2. Meridian view of a Francis turbine including the IRiS diaphragm at the cone outlet

Project implemented by

• **Coordinator:** Politehnica University Timisoara

Implementation period

08.01.2025 - 31.12.2026

Main activities

1. Design, execution drawing and manufacturing of the new IRiS device. Identification of the technical automation and control solution. Design of the automation and control system.
2. Implementation and testing of the new IRiS device on the experimental stand. SCADA system implementation, experimental measurements and validation.

Results

- Objective 1 with the planned activities, related to the stage of 2025, were fulfilled, by designing and manufacturing the IRiS device (Fig. 3). The degree of achievement of the deliverables in this stage was 100% (patent application).



Fig. 3. IRiS Device

Applicability and transferability of the results

- Next step is to implement and testing the new device to proff the concept by experimental measurements of unsteady pressure field.

Financed through/by

UEFISCDI

Research Center

- Research Institute for Renewable Energies

Research Team

Project leader:

- Dr. Eng. Constantin TĂNASĂ, S.R. 1

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- Assoc. Prof. Dr. Eng. George BELGIU
- Prof. Dr. Eng. Adrian STUPARU
- PhD Student Georgiana Greti GHERGHE
- Lect. Dr. Eng. Alin BOSIOC
- Asist. Dr. Eng. Sorin NANU
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INTERNATIONAL RESEARCH PROJECTS

MODELLING OF THE KINETICS OF H_2^+ , BeH^+ , NH^+ , AND ISOTOPOLOGUES AT HIGH ENERGY OF THE INCIDENT ELECTRON IN FUSION PLASMA

Goal of the project

• The project proposes a theoretical study of reactive collisions between electrons and molecular cations: H_2^+ , BeH^+ , NH^+ and their isotopologues using the Multichannel Quantum Defect Theory method, providing data in terms of cross sections and rate coefficients, usefully for modelling the kinetics of ionized media involving edge fusion plasma at the reactor walls.

Short description of the project

- The dialogue between scientific communities like experimentalists, theoreticians and modelizers is often far from expectations: our approach, going from fundamental aspects to the applied ones, fills a part of this gap in the field of reactive cold plasmas.
- We perform calculations of cross sections and rate coefficients for a wide range of energies and for a large number of ro-vibration levels, in order to meet the need for rates expressed by different communities of fundamental and applied physics.

Project implemented by

- **Coordinator:** Politehnica University Timisoara
- **Partners:**
 - International Atomic Energy Agency (IAEA) -Vienna



Implementation period

- 11.10.2023-01.11.2028

Main activities

- All activities included in the planned programme of project are successfully implemented according with the objectives of the CRP : The Formation and Properties of Molecules in Edge Plasmas:

1. Systematic calculations of dissociative recombination (DR), vibrational excitation (VE) and dissociative excitation (DE) cross sections and rate coefficients of BeH^+ , and its isotopomers: BeD^+ and BeT^+ by extended the incident electron energy above 2.7eV. The domain of energy will be between 2.7eV-12eV.

2. Dynamic calculations of DR și RVE (ro vibrational excitation) cross sections for H_2^+ , D_2^+ , HD^+ , NH^+ , will be computed to higher energy. The Maxwell rate coefficients of both rotational and vibrational transitions, and outline several important features, as isotopic and

resonant effects will be provided and highlighted.

Results

- Our previous results of dissociative recombination, vibrational excitation and vibrational de-excitation of the BeH^+ ion by electrons, based on the MQDT method, are extended to collision energies above the dissociation threshold. The number of dissociative states included in our cross section calculations are also significantly increased.

- The cross sections and Maxwell rate coefficients for BeH^+ , H_2^+ are suitable for modelling the kinetics in edge plasma in fusion devices.

- The project results in 2025 were disseminated by publication of scientific articles:

- 1. **Rydberg states and new resonant states of the imidogen molecule NH: pathways for nitrogen release**, Phys. Chem. Chem. Phys., 2025,27, 13021-13032. This paper is focused to the bound states for nine symmetries have been detailed many of which, particularly the singlet states, were never studied before. Several resonant states of different symmetries, which were unknown until now, have been systematically identified and their widths are calculated. It is hoped that the bound and the new resonant states obtained here will open up other molecular dynamics studies.

- 2. **Electron impact ro-vibrational transitions and dissociative recombination of H_2^+ and HD^+ -Rate coefficients and astrophysical implications**, R. Hassaine, E. Djuissi, N. Pop, F. Iacob, MDE Epée, et al, Astronomy & Astrophysics, 2025. We present a new set of cross sections and rate coefficients for state-to-state ro-vibrational transitions (RVT) of the H_2^+ and HD^+ ions, induced by low-energy electron collisions. The study includes the major electron-impact processes relevant for low-metallicity astrochemistry: inelastic and superelastic scattering, and dissociative recombination (DR).

- These data provide updated and improved input for the modeling of hydrogen-rich plasmas in environments where a high abundance of free electrons is expected, such as planetary nebulae, HII regions,

and the ionospheres of giant planets.

3. Participation to the international conference:

38th International Vacuum Nanoelectronics Conference (IVNC), Reykjavik, Iceland, paper entitled: **Molecular dynamics simulation of discrete particle ionization and recombination in a microdiode**, A. Jónsson, K.Torfason, Nicolina Pop, A. Manolescu, Á.Valfells.

Applicability and transferability of the results

- These numerical results are usefully for the detailed kinetics modeling, either in astrophysics, or in the cold plasma close to the wall of the fusion devices. Many of the project are highly significant to the international fusion plasma community for the ITER fusion reactor project.

- The numerical results could be included in major international databases such as IAEA database, LxCAT and KIDA (Kinetic Database for Astrochemistry).

Financed through/by

- International Atomic Energy Agency (IAEA) — Research Contract No 28231

Research Center

- Research Center for Advanced Study Methods for Physical Phenomena

Research Team

Project leader:

- Prof. Dr. Habil. Nicolina POP
(Coordinator of Research Center for Advanced Study Methods for Physical Phenomena)

Researchers:

- Assoc. Prof. Dr. Eng. Razvan BOGDAN
- Lecturer Dr. Eng. Ildiko TATAI

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DECONSTRUCTION AND REFABRICATION FOR THE REUSE OF STEEL BUILDINGS

Goal of the project

- The project aims to study deconstruction and reuse of steel structures, and addresses the critical technical challenges involved, such as structural safety, reuse techniques, and the implementation of robotic deconstruction.

Short description of the project

- In the context of reducing significantly energy-intensive recycling of steel elements, deconstruction and reuse represents a more sustainable alternative. Demountable solutions, influence of geometric imperfections accumulated through first operational life of structures and robot assisted deconstruction are part of the expected main results.

Project implemented by

• Coordinator:

- Håme University of Applied Sciences

• Partners:

- Politehnica University Timisoara
- University of Coimbra
- FERPINTA Group
- ROBOPLAN
- Würth Oy
- Jupa S. A
- SSAB Europe Oy
- STAR Institute

Implementation period

- 01.09.2023 – 31.08.2027

Main activities

Main activities carried out within the project:

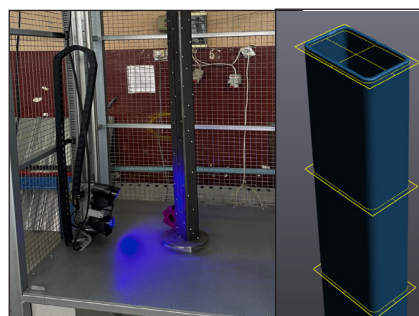
- Analysis of the available deconstruction options for composite construction and tubular truss structures;
- Investigation of the effects of increased geometrical imperfections due to deconstruction, loading during the first life period and refabrications;
- Effect of multiple welding-cutting-welding thermal cycles and development guidelines for structural safety regarding refabrication solutions;
- Development of innovative demountable solutions for composite construction with robot-assisted deconstruction;
- Development of innovative demountable mechanical solutions for tubular roof trusses;

- Development of robot deconstruction methods for demountable steel elements;
- Assessment of improvement strategies of design for deconstruction and environmental impact for the buildings by reuse and re-fabrication.
- Dissemination of results.

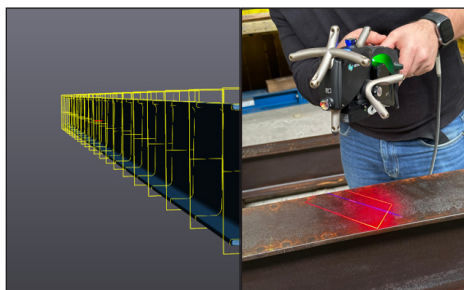
Results

- Preliminary results include:

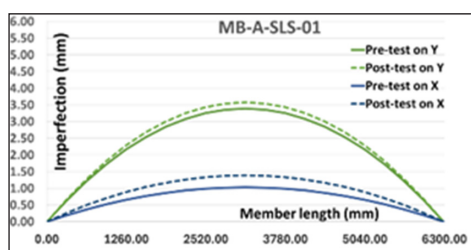
- An automated scanning system developed by Politehnica University Timisoara;
- Demountable shear connectors experimentally tested by University of Coimbra;
- Robot assisted deconstruction system developed by ROBOPLAN, STAR Institute and University of Coimbra;
- Demountable RHS truss joints analyzed numerically by HAMK;
- The automated scanning system was developed for enhancement of scanning the structural element in view of evaluation the geometric imperfections.



- The system was successfully applied to measure geometric imperfections that are related to fabrication and first life cycle, prior and after testing of structural parts of a steel truss, such as top chord and web;
- Members in bending such as IPE secondary beams were also evaluated to assess the accumulation of geometric imperfections with a portable 3D laser scanner with smart optical tracking device;
- In both cases geometric imperfections were evaluated by considering a second-order polynomial function of the measured



total imperfections, constrained to pass through the centroids of the end cross-sections and additional equally distanced cross-sectional centroids.



Further measurements were conducted on elements from decommissioned structures to evaluate imperfections before and after re-adaption and reuse.

Applicability and transferability of the results

- The benefits of the project include besides cost-reduced structures, business opportunities based on deconstruction and re-fabrications instead of demolition and significant energy savings. The whole process becomes faster, safer, and better by the incorporation of robots in the construction and deconstruction of the buildings.
- The faster production cycle and reuse of structures also have the potential of bringing competitive solutions for the steel construction market. The environmental benefits due to the reuse process instead of recycling bring important energy savings and consequently smaller environmental load.

Financed through/by

European Research Fund for Coal and Steel (RFCS)

Research Center

Research Center for Materials Mechanics and Structural Safety (CEMSIG)

Research Team

Project leader:

– Prof. Dr. Eng. Adrian CIUTINA

Researchers:

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– Prof. Dr. Eng. Viorel UNGUREANU

– Prof. Dr. Eng. Florea DINU

– PhD Student Viktor SZALAI

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COST ACTION CA24125 – CULTURAL HERITAGE IN CRISIS. TRANSDISCIPLINARY ASSESSMENT OF LEGAL AND REGULATORY FRAMEWORKS (CRICULT)

Goal of the project

- **CRICULT** aims to strengthen the protection of cultural heritage during times of crisis by creating an international and interdisciplinary research network.
- The project examines how different types of crises—such as armed conflicts, climate change, trafficking of artifacts, forced migration, and overtourism—affect cultural heritage. Its main goal is to develop crisis and solution matrices that support research and inform effective cultural heritage protection policies.

Short description of the project

- **CRICULT** is an initiative aimed at safeguarding cultural heritage during times of crisis.

Project implemented by

- **Coordinator:**
 - **Prof. Piotr STEC**
University of Opole (Uniwersytet Opolski), Poland (Action Chair, COST Action CA24125)
- **Partners:**
 - **Assoc. Prof. Dr.Arch. Cristina-Maria POVIAN**
Politehnica University Timișoara, Romania
(Management Committee Member, COST Action CA24125)
(<https://www.cost.eu/actions/CA24125/#tabs+Name:Management%20Committee>)

Results

- Defining thematic priorities within the Working Group;
- Administrative and organizational responsibilities as a Management Committee (MC) Member

Implementation period

- 29.09.2025-28.09.2029

Main activities

- Contributing to the definition of thematic priorities within the Working Group;
- Participating in the development of the Action's research agenda and strategic objectives;
- Supporting the preparation of crisis and solution matrices related to cultural heritage.

Applicability and transferability of the results

- Participation in the Management Committee will strengthen Romania's contribution to discussions on cultural heritage protection in times of crisis and support the development of relevant public policies.
- The knowledge gained through the network will be transferred to my department and faculty through teaching, research collaboration, and the integration of new topics into courses and seminars.
- Best practices and methodologies developed within the network will also be applied in my academic and research activities.

Financed through/by

- Funding is provided through the COST (European Cooperation in Science and Technology) programme.

Research Center

- Research Center for Urban Planning and Architecture

Research Team

Project leader:

MC Member: Assoc. Prof. Dr.Arch. Cristina-Maria POVIAN

Researchers:

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- PhD Student Arch. Victor MARIȘ
- PhD Student Ștefania DĂNILĂ
- PhD Student Arch. Răzvan GAIȚĂ
- PhD Student Sebastian FEJES-SAVA

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Project Website: <https://www.cost.eu/actions/CA24125/#tabs+Name:Management%20Committee>

CIRCULARITY AND INDUSTRIAL SYMBIOSIS IN INDUSTRIAL PARKS AS TOOLS FOR GREEN TRANSITION (CATALYST)

Goal of the project

- The project aims to accelerate the adoption of the circular economy in Romania and to strengthen cross-border cooperation between Romanian and Norwegian industrial actors by providing companies and industrial parks with strategies for the circular economy and practical tools for waste valorization.

Short description of the project

- Creating a framework for collaboration between Romania and Norway, facilitating the adoption of circular economy models.

Project implemented by:

• Coordinator:

- Association National Centre for Sustainable Production and Consumption

• Partners:

- Norsk Institutt for Vannforskning
- Politehnica University Timisoara, Romania
- Thamsklyngen

Implementation period

- 01.09.2024-31.01.2025

Main activities

1. Information and research campaign by:

conducting a survey among companies and industrial parks to identify challenges and opportunities in Romania and Norway; organizing an informative webinar for stakeholders in Romania.

2. Educational program for industrial facilitators by creating a bilingual educational package (EN, RO, NO), available online

3. Accelerating circular economy practices: selecting a pilot industrial park in Romania and conducting a detailed technical analysis to identify waste streams and potential synergies; organizing a workshop for companies using design thinking methodology

4. Bilateral Visits: organizing two bilateral visits (in Norway and Romania), involving professionals who will benefit from knowledge transfer and establish new collaboration opportunities.

Results

- Bilateral exchange of knowledge and practical implementation based on the bilateral study visits organized in Romania and Norway, where industrial park managers, sustainability experts, and industry leaders gathered to exchange best practices.

- Inspired by these experiences, Romanian industrial actors began identifying potential synergies in Cluj Innovation Park, laying the groundwork for the real implementation of industrial symbiosis.

- 20 professionals were trained as industrial symbiosis facilitators, ensuring that companies have the technical expertise necessary to integrate sustainability into their operations.

- Action Plan for resource efficiency and industrial symbiosis, providing a clear guide for expanding circular economy



Fig. 1 Practices in industrial parks in Romania

Applicability and transferability of the results

- One of the most important aspects highlighted in the project was that collaboration and trust are essential for the success of industrial symbiosis implementation. Companies need to engage in open dialogue to identify common opportunities, and investing time in collaborative networks and facilitating interactions can reveal synergies where they are least expected.
- Early implementation should focus on identifying resources and needs without overwhelming industrial actors with complicated data collection processes.
- A pragmatic and practical approach encourages participation and accelerates the adoption of solutions.

Financed through/by

- Fund for Bilateral Relations
EEA and NORWAY GRANTS in Romania

Research Center

- Research Center for Environmental Science and Engineering
<https://eertis.eu/errf-2300-000z-1377>

Research Team

Project leader:

- Prof. Dr. Eng. Florica MANEA

Researchers:

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EMERGE ROMANIA - EMPOWERING COMMUNITIES FOR ENERGY TRANSITION TOWARDS CARBON NEUTRALITY IN ROMANIA

Goal of the project

- Strengthening the cooperation and increasing mutual knowledge between 6 partners from Romania and Smart Innovation Norway, by developing standardized and feasible models for the foundation and acceleration of energy communities, during the entire project implementation (6 months) and beyond its finalization.

Short description of the project

- The project develops technical and financial models to analyze energy community opportunities in local communities of the project consortium, which will be essential for complex Feasibility Studies, the first of their kind in Romania.

Project implemented by:

• Coordinator (Project Promoter):

- Bucharest University of Economic Studies

• Partners:

1. Energy Advisor
2. Politehnica University Timisoara
3. Smart Innovation Norway
4. Municipality of Alba Iulia
5. Buteni Commune
6. Crucea Commune

Implementation period

23.08.2024-31.01.2025

Main activities

The main activities were:

- Building a comprehensive database regarding the energy behavior and consumption of end users and the basic characteristics of households in a particular geographical area.
- Develop a comprehensive technical study assessing the infrastructure requirements and potential technological solutions for establishing energy communities in the targeted pilot sites.
- Perform an economic study to evaluate the financial viability and potential economic benefits of implementing energy communities within the specified local public entities.
- Developing a Communication Toolkits regarding energy community's establishment and optimizing the prosumer behavior both for Romania and Norway.

Results

- **R1. Bilateral Learning Workshop** - Enhancing mutual understanding and collaboration between Norwegian and Romanian partners to deepen insights into energy communities within the framework of green transition.
- **R2.** A report consisting of technical economic, and social Norway's experiences in energy communities including three case studies. The report provide concrete examples and actionable recommendations for Romania's energy community ecosystem.
- **R3.** A comprehensive database regarding the energy behavior and consumption of end users and the basic characteristics of households in the MAI, BUT, and CRU pilot sites.
- **R4.** Strengthening the bilateral cooperation between Norway and Romania by empowering project partners with comprehensive insights into the technical feasibility of energy communities tailored to municipalities of varying sizes, particularly to the EMERGE pilot cases.
- **R5.** Strengthening the mutual knowledge of RO and NO partners regarding the economic feasibility of energy communities by developing and testing financial models tailored to the EMERGE pilot case
- **R6.** Elaboration of a Communication Toolkit for Romania and Norway, featuring in-depth guidance on establishing and optimizing energy communities

Applicability and transferability of the results

- The strategic cooperation between the stated institutions aims to stimulate energy and economic innovation, with an emphasis on energy communities as an emerging innovation.
- This relationship aims to improve Romanian university education through bilateral knowledge transfer, applied research, and infrastructure development.
- The project formulates technical and financial models to evaluate energy community prospects within the localities of the project consortium, which will be crucial for intricate Feasibility Studies, the first of their kind in Romania.

Financed through/by

- EEA and Norway Grants, Open Call for Bilateral Cooperation in the Green Transition

Research Team

Project leader:

- Assoc. Prof. Dr. Eng. Attila SIMO

Researchers:

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- Assoc. Prof. Dr. Eng. Alexandru BĂLOI
- Lecturer Dr. Eng. Ioan BORLEA

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TRUSTWORTHY PNT FOR UNMANNED AERIAL SYSTEMS (TOPASE)

Goal of the project

- The main objective of **TOPASE (Trustworthy Pnt for unManned aerial SystEms)** is to leverage innovation to design and develop highly reliable, and integrity compatible UAS PNT navigation solutions.

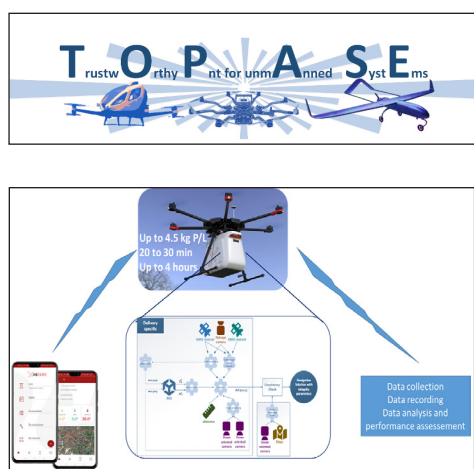


Fig. 1. Prototype set up high-level overview

Short description of the project

- Unmanned Aerial systems (UAS) industry has undergone significant growth, propelled by advancements in miniaturization, cost-effectiveness and sensor fusion frameworks.
- However, this market is still lacking trustworthiness as enabler for safety-sensitive operations. To achieve scaled adoption, user acceptance, and compliance to regulatory and standardization ecosystem are key considerations, driven by safety.
- **TOPASE (Trustworthy Pnt for unManned aerial SystEms)** aims at leveraging innovation in designing and developing highly reliable UAS Positioning Navigation and Timing (PNT) solutions. The project's primary focus lies in Beyond Visual Line Of Sight (BVLOS) operations and critical use-cases, such as: Critical Infrastructure Surveillance (specific category), Delivery of Specific Goods between Two Identified Points (specific category), Taxi Drone (certified category).
- **TOPASE results** are supported by an End to End Proof of concept aligned with a real commercial use case bringing viability of the business plan and maximizing the solution go to market.

Project implemented by:

- **Coordinator:**
Thales Alenia Space, France
- **Partners:**
 - Politehnica University Timisoara, Romania
 - ABzero, Italy
 - Drone Volt, France

Implementation period

- 11.07.2024 – 15.12.2025

Main activities

- A Payload system (equipped with a stereoscopic camera, a sky-facing fisheye camera, and an RTK GNSS system) was developed to increase flight stability and achieve better positioning accuracy. The project contains these main phases: payload design, laboratory tests, flight tests, flight recording data (images, GNSS and IMU data), flight algorithm development and training, as well as final flight tests.

Results

- The UPT Team has successfully developed the payload, equipped with 3 cameras (one fisheye camera and 2 Raspberry cameras). The UPT team in collaboration with the partners helped performed ground tests to capture videos with the Raspberry PI cameras and implement the synchronization system between the video data with the IMU and GNSS measurements.
- The UPT team developed an algorithm that takes the GPS coordinates from a video footage by comparing them with Google Maps images, predicting the drone trajectory (see Fig. 2)
- The algorithm developed by the UPT team predict the flight path (magenta points) based on IMU/GNSS data and Google Maps feature recognition (see Fig. 3)

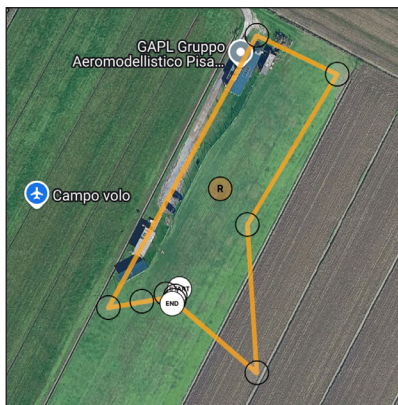


Fig. 2. Reference trajectory of the drone in the East-North reference frame

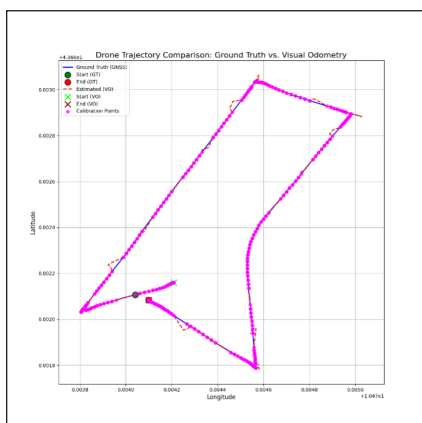


Fig. 3. UPT output algorithm: drone trajectory prediction

- The goal pursued by embedding a Fish Eye is to be able to extract the NLOS/LOS information from the images and to improve the final navigation solution in terms of integrity and accuracy.
- UPT proposed a segmentation algorithm for the images captured by the fisheye camera, to identify clear sky regions, vegetation regions and a probability map of NLOS for each pixel of the image (see Fig. 4)

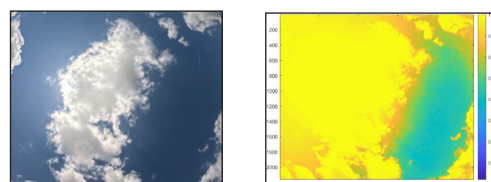


Fig. 4. UPT output algorithm: Image of the sky from the drone and associated probability map

Applicability and transferability of the results:

- The project results will be used by the European Space Agency to improve its drones' ability to navigate and maintain their position and orientation.

Financed through/by

(European Space Agency Navigation Innovation and Support Programme) NAVISP-EL1-073: TRUSTED PNT FOR UNMANNED AERIAL SYSTEMS, No. 1520124514 TAS-24-ACQ-01149

Research Center

Research Center for Intelligent Signal Processing
(<https://shannon.etc.upt.ro>)

Research Team

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E³UDRES² ENT-R-E-NOVATORS – BRIDGING THE GAP BETWEEN ENTREPRENEURS, RESEARCHERS, EDUCATORS AND INNOVATORS

Goal of the project

- **E³UDRES² Ent-Re-Novators project** aims to co-create a more specific joint research and innovation strategy and a common agenda to accelerate the transformation into a European multi-institutional R&I Hub for Smart and Sustainable Regions.
- The project includes, interacts and collaborates with a variety of smart and ambitious people, academic institutions, regional authorities, companies, European R&I networks and regional innovation ecosystems. It is committed to scientific excellence and research integrity and promotes (future) R&I competences, skills, resources, methods, training, services and management for collaborative research and open innovation.

Short description of the project

– The project develops support for enabling scientific communities to fully embrace OS, OI, OE, Engaged Science and Education. **E³UDRES² Ent-r-e-novators** seeks to transform the region into a center of excellence in R&I.



Project implemented by

- **Coordinator:** Polytechnic Institute of Setúbal, Portugal
- **Partners:**
 - Politehnica University Timisoara, Romania
 - St. Pölten University of Applied Sciences, Austria
 - Hungarian University of Agriculture and Life Sciences, Hungary
 - UC Leuven-Limburg University of Applied Sciences, Belgium
 - Vidzeme University of Applied Sciences, Latvia

Implementation period

01.10.2022 – 30.09.2025

Main activities

The future of Europe requires knowledge and scientific culture, access to open science and education as an unalienable right for all. The project aims to develop the **E³UDRES² R&I dimension**, by employing innovative methodologies and environments. **Ent-r-e-novators** set itself six objectives to reach:

1. Co-create a common strategy to unlock the potential for excellence in R&I
2. Develop best practices for sharing research infrastructures, expertise, data and resources
3. Develop structured support to empower scientific communities to fully embrace OS, OI, OE, Engaged Science and Education
4. Achieve institutional strategies for Human Resources for Research, to address challenges such as brain mobility and new career assessment

5. Develop a framework to link all our R&I ecosystems and the E³UDRES² alliance's knowledge triangle of education, research and innovation

6. Build a common R&I agenda with peer Alliances and HEIs, HEI associations, advocacy groups, and policy-makers

Results

- On 5-7 March 2025 took place the sixth General Assembly and Executive Board meetings of the Ent-r-e-novators project in Valmiera, Latvia. The main topic was Human resources for research according to the European standard, with a focus on the state of each partner's application for receiving the HRS4R – Human Resources Strategy for Researchers Label
- On 13 of May 2025, the project organized a Science Policy Conference in Portalegre, Portugal, where partners gave more presentations and realized two panel discussions on the topic
- The final General Assembly meeting and Executive Board meeting took place in Setibalm Portugal, during 23-26 September 2025. It was a good occasion to review all project's results and to start preparing the final project report
- On the same occasion, on 24 September 2025 was organized an International Workshop on Citizen Science, as one of the project's dissemination events

As part of the **Ent-r-e-novators project**, UPT organized on 02-06 June 2025 the **PhD Summer School** with the topic **Open Practices in Higher Education**, with over 70 students from 22 countries participating in person, and about other 400 students and young researchers participating online via Zoom (see photo)

Applicability and transferability of the results

- **Ent-r-e-novators** promotes Open Science, Open Innovation, Open Publishing and Citizen Science for the benefit of all members of the community. This is already a transferable goal, that aims at the development of small and medium-sized cities and their rural environments into smart and sustainable regions.
- The project aims to develop further co-operation applications under Horizon Europe, Erasmus+ KA2, Marie Curie doctoral consortiums and other international funded calls.

Financed through/by

- European Commission, Horizon Europe Program, HORIZON-WIDERA-2021-ACCESS-05

Research Center

Research Center for Multimedia

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(Director Institute for Digital Transformation, Director Research Center for Multimedia)

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- Prof. Dr. Ec. Claudiu ALBULESCU
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- Dr. Ec. Roxana SÎRBU



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EBSI-NE – DEPLOYMENT OF EBSI PRODUCTION NODES AND PROVISION OF SUPPORT SERVICES TO EBSI NETWORK AT THE EUROPEAN LEVEL



Goal of the project

• The **EBSI-NE project** is a collaborative initiative between 24 organisations from 14 European countries, all renowned for their expertise in Distributed Ledger Technologies and previous EBSI initiatives. The central mission of the project is to fortify the **European Blockchain Services Infrastructure (EBSI) network** by adding 18 new validator nodes to the production network and delivering comprehensive support services to all EBSI relevant stakeholders. By strengthening the EBSI network and providing essential support services, **EBSI-NE** is helping to accelerate the adoption of blockchain technology across Europe.

Short description of the project

The objective of **EBSI-NE** is to support the development and adoption of the EBSI network at European level by increasing the number of validating nodes in the production network and by providing assistance services for all EBSI stakeholders.

Project implemented by:

• Coordinator:

Ministerio de Asuntos Economicos y Transformacion Digital (SGAD), Spain

• Partners:

- Politehnica University Timisoara, Romania
- UEFISCDI Romania
- TU Delft, Netherlands
- Other 20 organizations from 14 European countries

Implementation period

01.05.2023 – 31.07.2025

Main activities

- Activities include tasks to deploy an EBSI production node and other voluntary actions: integration of SIEM tools, development of tailored tests to improve robustness, development of framework to qualify EBSI nodes as trusted e-ledgers for eIDAS 2.

- The projects' work packages are:

WP1 – Management

WP2 – Deployment of EBSI node

WP3 – Support services to EBSI

WP4 – Communication & dissemination

Activities related to WP2:

- Prepare the infrastructure that meets EBSI Node Operator policy requirements and follows the EBP policy
- Deploy and configure EBSI node software package
- Perform infrastructure tests to ensure reliability and security

WP3 related activities:

- Create technical competence centers at national level
- Provide security support services
- Create tools to improve the node operation lifecycle
- Organize online technical trainings
- Assess EBSI Network initiatives at national level
- Definition of methodology and approach to qualify EBSI validator nodes as e-ledgers for eIDAS2

Results

- **EBSI-NE** will provide 18 EBSI production validator nodes and additional support services to contribute towards the deployment and extension of the EBP use cases.

Regional technical and security services will be provided, which are estimated to be up and running as soon as a node is deployed in the network.

- In order to increase the security of the EBSI network as well as its resilience and performance, the project will set-up and integrate with the node a Security Information and Event Management (SIEM) tool.
- Other support services to improve resilience, performance, robustness, security and sustainability of the EBSI network: delivery of EBSI trainings, development of technical tools to support future node operators, reports to cover possible synergies between EBSI and national blockchain initiatives.

In UPT a virtual EBSI Operator Node has been installed through the Cloud UPT centre. The node is fully functional and received the approval from the EBSI services of the European Commission. The node still needs to apply for the **ISO 27001 certification**.

Applicability and transferability of the results:

- The project is strongly aligned to the EU's long term digital policies and blockchain strategy. It will help establish the required infrastructure for the expansion and adoption of blockchain technology, one of the key digital technologies prioritized by the European Commission to increase the digitalization of the European society.
- The consortium groups organizations from 14 EBP members to collaborate on the development of this infrastructure, avoiding fragmentation of the blockchain landscape in Europe.
- Active cooperation between the participants is sought to create and monitor a blockchain network that promotes a more secure and interoperable infrastructure, further developing the baseline objectives established in the EU blockchain strategy.

Financed through/by

- Digital Europe Programme
- DIGITAL-2022-DEPLOY-02
- European Commission,
- European Health and Digital Executive Agency (HADEA)

Research Center

- Research Center for Multimedia

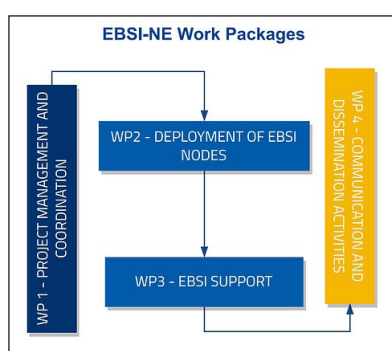
Research Team

Project leader:

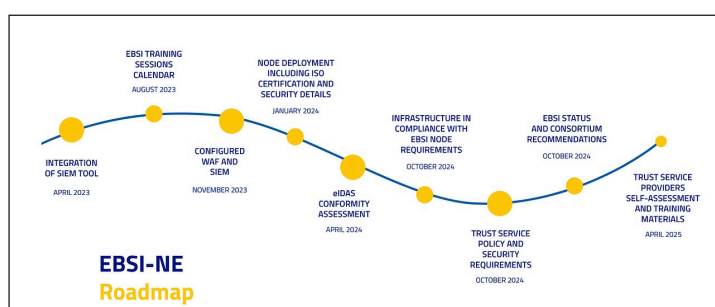
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Researchers:

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- Prof. Dr. Eng. Carmen HOLOTESCU
- Lecturer Dr. Eng. Andrei TERNAUCIUC
- PhD Student Victor HOLOTESCU



EBSI-NE Work Packages



EBSI-NE Roadmap

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EBSI-VECTOR – EBSI ENABLED VERIFIABLE CREDENTIALS & TRUSTED ORGANISATIONS REGISTRIES



Goal of the project

- **EBSI-VECTOR** brings the power of the self-sovereign identity paradigm to the educational and social security context. Defining and implementing the strategy for expanding EBSI capabilities in different countries is essential.
- The project provides the necessary basic elements and tools for citizens and organizations to interact with each other through verifiable credentials and to use the confidentiality-based verification power of the EBSI decentralized trust registers.
- The project is part of an extended ecosystem with other EU projects and initiatives (ESSPASS, EHIC, EUROPASS).

Short description of the project

EBSI-VECTOR contributes to Digital transformation in specific areas (educational credentials, social security) at EU level through blockchain technologies.

Project implemented by:

• Coordinator:

Engineering – Ingegneria Informatica SPA (ENG), Italy

• Partners:

- Politehnica University Timisoara, Romania
- UEFISCDI Romania
- Alma Mater Studiorum – Universita di Bologna (UNIBO), Italy
- KU Leuven, Belgium
- Université de Lille, France
- Other 47 organizations from 20 European countries

Implementation period

01.06.2023 – 31.05.2025

Main activities

The consortium formed by 52 partners from 20 countries strengthens the current capabilities of EBSI regarding verifiable accreditations and trust registers and expands them with new capabilities such as the decentralized identity of legal entities or the revocation functionality. The project partners will transform the digital interaction of citizens studying and working in Europe and will simplify some of the complex verification processes for organizations in a decentralized way.

EBSI-VECTOR project work packages are:

WP1 – Project Management and Coordination

WP2 – Strategizing for scaling up, take-up, and interoperability of EBSI use cases

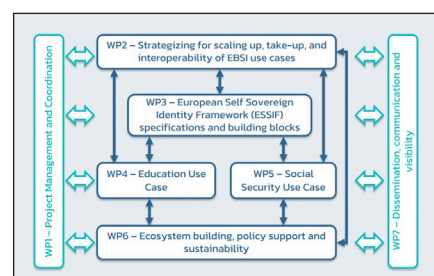
WP3 – European Self Sovereign Identity Framework (ESSIF) specifications and building blocks

WP4 – Education Use Case

WP5 – Social Security Use Case

WP6 – Ecosystem building, policy support and sustainability

WP7 – Dissemination, communication and visibility



EBSI - VECTOR WPs

Results

The project partnership started working on different Use Cases on the following topics:

- Education
- Social security
- Business registries

UPT is interested and involved in educational applications and in providing training for those skills.

This use case is performed from WP4, and aims to implement new

and current EBSI capabilities through a two-phase approach. The first phase will be focused on implementing current EBSI capabilities and the second one will address new EBSI capabilities. This use case is based on EBSI Diploma use case specifications. At the end, several cross – border journeys for educational capabilities will be deployed.

• **EBSI-VECTOR** received the prize under “Public Sector Innovation” category at the **INATBA Awards Gala in Autoworld, Brussels**.

Applicability and transferability of the results:

EBSI-VECTOR contributes to the following long-term EU policy objectives, ensuring results’ transferability:

- Building a pan-European public services blockchain
- Promoting legal certainty, by compliance with eIDAS
- Increasing funding for research and innovation through:
 - (i) efforts for scalability
 - (ii) building strong ecosystem with other digital technologies.
- Promoting blockchain for sustainability by reducing the environmental footprint:
 - (i) directly – through decentralized solutions
 - (ii) indirectly – through optimization of cross border services interoperability
- Supporting interoperability and standards
- Interacting with community through the creation of future governance framework for EU digital consortium for Blockchain



Financed through/by

Digital Europe Programme
DIGITAL-2022-DEPLOY-02
European Commission
European Health and Digital Executive Agency (HADEA)

Research Center

Research Center for Multimedia

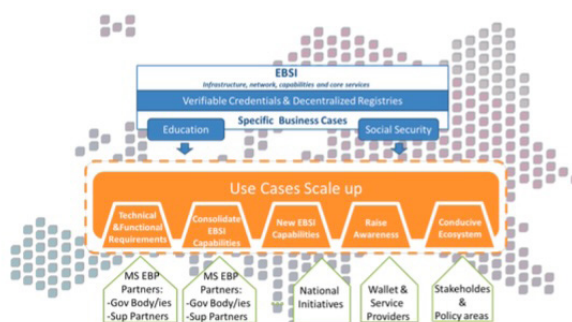
Research Team

Project leader:

– Lecturer Dr. Eng. Andrei TERNAUCIUC

Researchers:

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- Assoc. Prof. Dr. Eng. Diana ANDONE
- Prof. Dr. Eng. Carmen HOLOTESCU
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DC4EU – DIGITAL CREDENTIALS FOR EUROPE



Goal of the project

- The **DC4EU project** will focus on the identification and application of all necessary measures to facilitate the issuance of educational credentials and professional qualifications in the Education sector, as well as the issuance of the portable document A1 (PDA1) and the European Health Insurance Card in the Social Security sector.
- The European digital identity wallet will be a key element of hybridization for cross-sectoral and cross-border use cases (identity, signature, educational credentials and social security).

Short description of the project

DC4EU focuses on identifying and applying Digital Europe aspects in education: issuance of educational credentials and professional qualifications by engaging in the execution of the portable document A1 (PDA1).

Project implemented by:

- **Coordinator:**
 - Ministerio de Asuntos Economicos y Transformacion Digital (SGAD), Spain
- **Partners:**
 - Politehnica University Timisoara, Romania
 - UEFISCDI Romania
 - CertSIGN, Romania
 - Other 77 organizations from 23 European countries

Implementation period

01.04.2023 – 30.06.2025

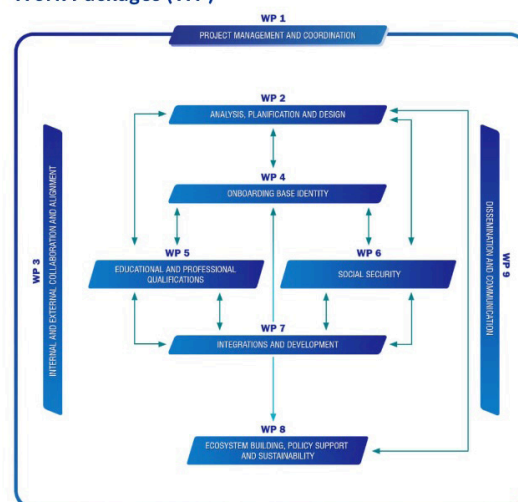
Main activities

The projects' work packages are:

- **WP1:** Project Management and Coordination
- **WP2:** Analysis, Planification and Design
- **WP3:** Collaboration and Alignment
- **WP4:** Onboarding Base Identity
- **WP5:** The Education Domain
- **WP6:** The Social Security Domains
- **WP7:** Integrations and Development
- **WP8:** Ecosystem building & policy support
- **WP9:** Communications & Dissemination

- UPT is mainly interested in WP5, regarding educational applications. This includes onboarding procedures, identifying educational requirements, implementing interfaces for credential issuers, comprehensive process testing of the systems and evaluation of processes.
- The European Digital Identity Wallet (EUDIW) will be a fundamental element of hybridization for cross-sectoral and cross-border use cases (identity, signature, educational credentials).
- **DC4EU** contributes to a new paradigm for citizens in the field of education, which is fully aligned with the European Council requirements for identity and data.

Work Packages (WP)



Results

The **outcomes of DC4EU** will build upon large-scale pilots focusing on education and professional credentials.

The Architecture Reference Framework and the wallet reference implementation are in progress.

- The project is aligned with the EU Digital Strategy, EU Data Strategy, EBSI framework, eIDAS Trust and GDPR.
- The basis is used data models (European Learning Model – ELM), existing EBSI framework, OTSS, EU strategies, and ongoing initiatives such as EWP, eduGAIN, Europass and European Universities initiative.
- The work related to education consists in designing and implementing educational credentials and professional qualifications. This will include onboarding customisation and execution, interoperability of preliminary tasks and identification of opportunities and synergies with domain-related activities.
- The models developed through the **DC4EU project** are piloted on a system of micro-credentials used within the **E³UDRES2 2.0 project** on European University Alliances.

Applicability and transferability of the results:

- The project develops digital transformation in education based on trusted registries, onboarding management for wallet users and support for process execution.
 - The project completes comprehensive testing of defined cross-border journeys in a pre-production environment of the target systems while coordinating with other ongoing cross-border initiatives and synergies with other educational-related activities: related DGs (H4, F3, EAC, EMPL), EU, and Key education players.
 - That's why **DC4EU** will be a catalyst for innovation in education identification requirements and will assist the evolution process from the traditional identification to a reliable digital identity.
- The level of standardization ensures transferability of results to any interested actor.

Financed through/by

- Digital Europe Programme
- DIGITAL-2022-DEPLOY-02
- European Commission,
- European Health and Digital Executive Agency (HADEA)

Research Center

Research Center for Multimedia

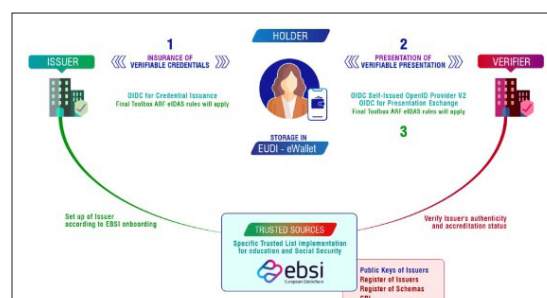
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ACCELERATE_FUTUREHEI – ENTREPRENEURIAL & INNOVATIVE UNIVERSITIES ACCELERATION PROGRAMME



Goal of the project

- Higher Education Institutions can positively impact regional and Europe-wide social and economic development through education, research and engagement. However, they require targeted support to enhance their capability to fully realise their potential.
- **Accelerate Future HEI** will develop and test acceleration services, to equip **HEIs** with the skills and capacity to drive institutional transformation towards becoming more entrepreneurial and innovative institutions over the next four years.

Short description of the project

- HEIs are key drivers of knowledge and innovation ecosystems, but there is a clear need for a targeted support to realize this potential.
- The project develops and implements a methodology of change by embracing entrepreneurial, engaged, innovative and open spirit.

Project implemented by:

- **Coordinator:** University Industry Innovation Network (UIIN), Netherlands
- **Partners:**
 - Politehnica University Timisoara, Romania
 - University of Applied Sciences St. Pölten, Austria
 - UC Leuven-Limburg University of Applied Sciences, Belgium
 - Universidade da Madeira, Portugal
 - Hungarian University of Agriculture and Life Sciences, Hungary
 - Vidzeme University of Applied Sciences, Latvia
 - Universidad Europea de Canarias, Spain
 - Université de La Réunion, France
 - Instituto Superior Tecnico Lisboa, Portugal
 - TUM International GmbH, Germany
 - Momentum Marketing Services Limited, Ireland

Implementation period

01.01.2023 – 31.12.2026

Main activities

Project work packages:

- **WP1** – Management
- **WP2** – Scanning & Scoping
- **WP3** – Developing
- **WP4** – Testing & Implementing
- **WP5** – Capacity Building & Knowledge Exchange

- **WP6** – Monitoring & Evaluation
- **WP7** – Policy Feedback
- **WP8** – Quality Assurance
- **WP9** – Dissemination

The methodology is designed to build capacity within HEIs to enable them to pursue institutional transformations. The approach is based on a **gap-analysis**, that begins with understanding HEI's desired future / current state (WP2). HEIs are guided to identify the key challenges to be addressed via acceleration services and coaching activities, and develop a roadmap and implementation plan to achieve their desired institutional transformation and identify the required acceleration services (WP3). Finally, acceleration services are tested within the HEIs to drive entrepreneurial and innovative change, supported by coaching, monitoring and evaluation (WP4).

Results

The project provides open resources for European HEIs who are interested in transforming to build their capability to drive entrepreneurial change.

Up to the end of 2025, the following results have been shared:

- **Strategic vision statements** of the nine partners' towards becoming Entrepreneurial and Innovative Universities
 - **Synthesis Report:** Key findings based on a gap analysis, that begins with understanding the HEI's desired future and current state. "Where are the HEIs now?"
 - **The plan** for how HEIs gain skills and insights for acceleration and transformation
 - **Monitoring and Evaluation** of the impact of ITAP services
- In 2025 the Accelerate FutureHEI project offered the Big Prize for Entrepreneurship at the 2025 edition of the **International Digital Media Student Contest – IDMSC** (see photo).

Applicability and transferability of the results

- The aim of the project is to develop and test a methodology for acceleration services to support HEI institutional transformation, combining coaching services, investment strategy, quality and progress monitoring mechanism, followed by the widespread dissemination and policy feedback of the pilot test results.
- The project has been designed using a Logic Model framework, which aligns the aims of the project, with the activities (WPs), the outputs (deliverables), outcomes desired (benefits for the project target groups) and the long-term impacts.
- By supporting transformation through university-industry cooperation, engagement, entrepreneurial and innovation spirit, the project ensures a practical transfer of knowledge to other interested institutions.

Financed through/by

- European Commission,
- Horizon Europe Program,
- HORIZON-WIDERA-2022-ERA-01

Research Center

Department for Digital Education

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CA20139 - HOLISTIC DESIGN OF TALLER TIMBER BUILDINGS (HELEN)

Goal of the project

• The main objective of the **HELEN COST Action** is to foster international interest and effort in developing a shared understanding and deriving common guidelines for the Holistic Design of taller timber buildings. The synergistic HELEN network is formed by a large group of experts from a wide field of the built environment sector, where researchers and industrial partners exchange knowledge and skills that have historically been isolated to individual research fields.

Short description of the project

The **HELEN COST Action** will change the paradigm of building construction research, shifting R&D from isolated topics to an integrated interdisciplinary approach, which is critically necessary to safely design and build as well as correctly maintain and recycle taller timber buildings.

Project implemented by:

• **Coordinator:** COST Association AISBL

Partener: Politehnica University Timisoara, Romania

Implementation period:

October 2021 – October 2025

Main activities

The very essence and key to a successful **HELEN COST Action** will be intense interdisciplinary work with in-depth discussions and debate over a series of hypothetical and real case studies, followed by focused research work. Contrary to common building research work done in the past, where individual topics were assessed in depth by specialised teams working on isolated topics (i.e. just timber connections or just vibration of floor plates), research within the Action will be intensely collaborative and integrated.

The main activities are:

EG 1: Timber Engineering. This expert group will consist of members mastering fields of 1 timber structures, 2 timber connections, 3 fire behaviour, 4 seismic response, 5 wind response, 6 structural reliability, 7 robustness, 8 floor vibration, 9 maintenance, 10 disassembly, and 11 duration of load.

EG 2: Computational Modelling. This expert group will consist of members mastering fields of 1 fire spread modelling and 2 seismic modelling as well as 3 general finite element modelling.

EG 3: Building Physics. This expert group will consist of members mastering fields of 1 acoustics, 2 volatile organic compounds, 3 indoor air quality and 4 thermal behaviour.

EG 4: Architecture. This expert group will consist of members mastering fields of 1 architectural design, 2 room design, 3 facades and 4 urban planning.

EG 5: Construction Management. This expert group will consist of members mastering fields of 1 factory management, 2 construction site management, 3 logistics, 4 industrialization, 5 prefabrication and 6 waste management.

EG 6: Material Science. This expert group will consist of members mastering fields of 1 material production (engineered wood products), 2 adhesives, 3 coatings and 4 wood modification.

EG 7: Human Health. This expert group will consist of members mastering fields of 1 restorative design and 2 ergonomics.

EG 8: Life Cycle Analysis. This expert group will consist of members mastering fields of 1 life cycle analysis, 2 life cycle cost and 3 social life cycle analysis.

Results

Until this point, the research teams were made, the working groups were established and the first common meeting was organized.

During this first meeting, there was made a state-of-the-art report, and the next research steps were established.

Applicability and transferability of the results

• One of the main motivations for establishment of the **HELEN COST Action** consortium is the current lack of an interdisciplinary international expert network that is able to merge and push forward the recent advancements in the various areas related to multi-storey timber design and construction, which have been treated individually due to their diverse specific scientific areas.

• The advantage of the **COST Action** is that it provides a platform where the objectives will be dealt with in a holistic approach.

Financed through/by

Horizon 2020 Framework Programme of the European Union

Research Center

Research Center in Urban Planning and Architecture

Research Team

Project leader:

– Prof. Dr. Eng. Marius MOSOARCA (for Romanian team)

Researchers:

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- Assist. PhD Stud. Arch. Bogdan ISOPESCU
- Lect. Dr. Arch. Alexandra KELLER
- Lect. Dr. Arch. Iasmina ONESCU
- Lect. Dr. Arch. Cristina POVIAN
- Prof. Dr. Eng. Valeriu STOIAN

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MYDROID – MOBILE SYSTEM FOR DRONE IDENTIFICATION AND LOCALIZATION

Goal of the project

- The primary goal is to develop a modular, multi-sensor autonomous system for the early detection, identification, and 3D localization of unauthorized drones (UAVs) near critical infrastructure. The system aims to increase detection robustness by fusing acoustic, radio frequency (RF), and optical data to provide a unified tracking solution.

Short description of the project

- myDROID** is an advanced C-UAS (Counter-UAS) platform that integrates Unmanned Ground Vehicles (UGV) with “Virtual Pylon” tethered UAVs. It combines passive sensing (acoustic arrays and SDR-based RF detection) with active confirmation (VIS/Thermal cameras and Pulse Compression Radar) to secure large perimeters against “rogue” drones.

Project implemented by:

Coordinator: XTRATECRO SRL
(Manager: Eng. Dan Florin LEȘEANU)

Partners:

Politehnica University Timișoara (Lead: Lecturer Dr. Eng. Teodor PETRIȚA)

International Partners: MRAZ ROBOTICS and ALITER TECHNOLOGIES (Slovakia)

Implementation period

July 1, 2025 – June 30, 2028

Main activities

- Requirement Engineering:** Defined functional specifications and multi-sensor architecture (Hardware + Software).
- Hardware Prototyping:** Designed and executed initial modules for 4-channel microphone arrays and RF antenna matrices. Software
- Development:** Implemented the initial processing chain, including the MUSIC algorithm for acoustic Direction of Arrival (DOA) and YOLO-based visual tracking. Experimental
- Validation:** Conducted laboratory stand tests and controlled field flights to validate concept feasibility
- Dissemination:** Organized the “Mobile Systems for Drone Identification” workshop (Dec 11, 2025)

Results

Maturity Level: Successfully reached TRL3 for all core detection modules.

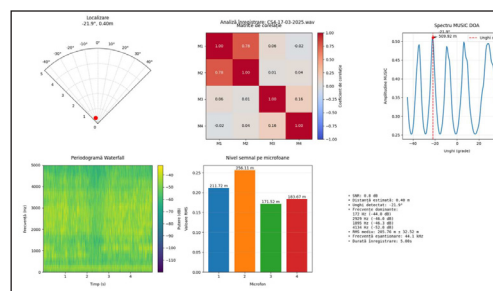


Fig.1. Acoustic DOA: Developed a Python-based real-time analysis tool achieving an angular error of <5 deg in laboratory conditions.

RF Localization: Validated SDR-based passive detection in the 2.4 GHz and 5.8 GHz ISM bands

Technical Documentation: Produced two volumes of scientific reporting covering Concept Design and Initial Prototype Execution.



Fig.2. Optical Tracking: Integrated a Jetson Xavier edge-AI platform capable of real-time bounding-box detection and “Slew-to-Cue” camera orientation

Applicability and transferability of the results

- **Lessons Learned:** Identified the critical need for GMSL2 interfaces to support remote sensors and the impact of environmental “ego-noise” on tethered drone sensors.
- **Technology Transfer:** The modular architecture allows for the deployment of independent nodes (fixed stations) or integrated mobile units for border security and industrial safety.
- **Roadmap:** 2026 will focus on moving to TRL4/5 by refining probabilistic sensor fusion (Kalman Filters) and deploying the “Virtual Pylon” configuration.

Financed through/by

- UEFISCDI via the EUREKA Network program (National Contract 14/2025)

Research Team

- **Project leader:**
Lecturer Dr. Eng. Teodor PETRIȚA
- **Researchers:**
 - Prof. Dr. Eng. Florin ALEXA
 - MSc Student Eng. Rareș DOBRE-BARON

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DANUBE RURALSCAPES - A NETWORK OF PROFESSIONAL SUPPORT FOR SELF-ORGANIZED VILLAGE CLUSTERS ACHIEVING SUSTAINABLE HERITAGE-BASED RURALSCAPES

Goal of the project

- **Danube Ruralscapes** aims to develop a common good practice model for rural town planning that can serve as a basis for national, regional and local-level public policies in the Danube Region area where national legislation and regional governance regulating heritage-based and sustainable rural planning are missing or not able to target village communities with limited resources and a lack of professional competences.
- The goal is to bring expertise and professional capacities in sustainable architecture, landscape planning, and heritage preservation to rural microregions, in village clusters with a potential for heritage-based, landscape-integrated, and climate conscious construction.

Short description of the project

- **Danube Ruralscapes** will increase institutional capacities through training and professional guidelines.

Project implemented by:

- Coordinator:

Budapest University of Technology and Economics

- Partners:

- Hungarian Contemporary Architecture Centre
- Pest County Municipality
- Politehnica University Timisoara
- Regional Development Agency "Braničevo-Podunavlje" Ltd.
- University of Belgrade - Faculty of Architecture
- "Ion Mincu" University of Architecture and Urbanism
- Romanian Order of Architects
- Association of Danube River Municipalities "Danube"
- National Tourism Cluster "Bulgarian Guide"
- Ivan Patzaichin – Mila 23 Association
- Josip Juraj Strossmayer University of Osijek Faculty of Civil Engineering and Architecture Osijek
- Municipality Kneževi Vinogradi
- Public Organization Agency of Sustainable Development &
- European Integration Lower Danube Euroregion
- Mehedinți County Council

Implementation period:

- 01/04/2025 - 30/09/2027

Main activities

- **Danube Ruralscapes** will work out solutions at the level of policies and tools tested in 7 pilot areas in 6 countries. The innovation comes from a bottom-up approach involving local society, NGOs, rural municipalities to co-create solutions in a collaborative framework with experts from universities and regional authorities by creating:
 - 1) A model for developing sustainable Ruralscapes in the Danube Region;
 - 2) A governance structure for village communities in alliance with regional and professional networks;
 - 3) Architecture and Rural Landscape Identity Guides for sustainable and heritage-based Ruralscapes

Results

- **Danube Ruralscapes** aims to give a solution to the lack of institutional and professional capacities of rural villages regarding the regulation and management of the architectural, heritage and landscape resources in their territories.
- 7 pilot areas will gain Architecture and Rural Landscape Identity Guides as a tool and institutional capacity building as professional support by project partners who will develop these into solutions to be integrated into regional and national policies.

Applicability and transferability of the results

- The rural areas of the Danube Region have a similar typology and scale, similar land uses and traditions, which are in many typological aspects different from other regions (West, South or North regions of the EU).
- Villages, especially in the former Eastern bloc countries faced environmental degradation and population loss since the middle of the 20th century, and these challenges need common action, seeing that none of the countries involved in the project have good policy and management solutions to the sustainable environmental preservation and development of rural landscapes.

Financed through/by

- This project is supported by the Interreg Danube Region Programme co-funded by the European Union

Research Center

- Research Center for Urban Planning and Architecture

Research Team

Project leader:

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REGENERATING INTERMEDIATE TERRITORIES THROUGH POSITIVE ENERGY DISTRICTS (INTERPED)

Goal of the project

- **InterPED** will develop territorial scenarios and PED strategies to foster the urban-territorial regeneration and refurbishment of intermediate territories involving stakeholders in Belgium, Italy, Romania, and Portugal.
- Serving as levers for a profound energy transition, effective regeneration, and holistic changes, these strategies will be defined through a shared co-productive methodology resulting in a set of energy, policy and regulatory, governance and social, territorial and integrated strategies for PEDs including testing and replication activities.

Short description of the project

- **InterPED project** aims to develop feasible, operational and inclusive strategies for PEDs in intermediate territories.

Project implemented by:

- Coordinator:

- Vrije Universiteit Brussel

- Partners:

- Politecnico di Milano
- Politehnica University Timisoara
- Universidade da Beira Interior

Implementation period:

- 01/05/2025 - 31/12/2027

Main activities

- **InterPED's** key activities are structured in seven work packages (WPs) and are designed to provide clear and logical progression of activities.
- Three WPs involve continuous tasks over the duration of the project: **WP1** (Management and Communications), **WP2** (Knowledge Hub) and **WP7** (Dissemination, Communication, Exploitation).
- **WP3** (Alignment and Framing) strategically works out a shared methodology and conceptual framework for the project and aligns the project's objectives.
- **WP4** (Territorial Regeneration Strategies), **WP5** (PED Regeneration Strategies), and **WP6** (Strategies Replication) form a progression of strategies and scenarios development, their assessment, the documenting and processing of promising energy transition pathways, and the identification of upscaling conditions.

Results

- The main objective for the first year is aligning on research results, develop a shared methodology for PED territorial guidelines/pathways and PED strategies in intermediary territories, a shared action-oriented framework and an archive (sources, references/best practices and of key information - dataset).
- Knowledge transfer from previous, current projects and research on PEDs and the studied territories to align project partners' interests and expectations.
- The aim is to develop:
 - 1) A shared theoretical and operative framework;
 - 2) A shared understanding /methodology for participatory action research;
 - 3) A shared online archive to support and inspire PED case study development (key tool to be implemented throughout the project).

Applicability and transferability of the results

- Together with project partners stakeholders will collaborate to develop regeneration and refurbishment strategies specific to their contexts.
- Then they will assess the impact of these strategies on PEDs in intermediate territories in general and research how successful strategies can be transferred to other places.

Financed through/by

- This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS/CCCDI -UEFISCDI, project number COFUND-DUT-InterPED, within PNCDI IV.

Research Center

- Research Center for Urban Planning and Architecture

Research Team

Project leader:

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Researchers:

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PLACECRAFT PLACES FOR COMMUNITY REVITALIZATION WITH RURAL FOCUS

Goal of the project

- The project aims to develop a sustainable socio-economic model of rural placemaking based on cultural heritage and tourism, especially targeting multicultural villages near urban centers along the Danube to create or revitalize community spaces in these settlements.
- In five selected villages in Hungary, Croatia, Serbia, Romania and Bulgaria, the partners will initiate participatory processes to involve the locals in the development of pilot projects based on a placemaking methodology using the tools of participatory design, artistic research and community programming aimed at the revalorization of local cultural heritage.
- The model will be collaboratively developed at the regional level with support from local municipalities, institutions, entrepreneurs, and associations.

Short description of the project

- **PlaceCraft** will develop an innovative placemaking co-creation model for rural communities

Project implemented by:

- Coordinator:

- Hungarian Contemporary Architecture Centre

- Partners:

- Budapest University of Technology and Economics;
- DANUrB International Association;
- Nansen Dialogue Center Osijek
- Placemaking Western Balkans
- Politehnica University Timisoara
- Asociatia Euroland Banat
- National Tourism Cluster "Bulgarian Guide"
- Regional Agency for Socio – Economic Development – Banat Ltd
- International Elias Canetti Society
- Baranja Development Agency of the City of Beli Manastir
- Foundation for contemporary art and media

Implementation period:

- 01/04/2025 - 30/09/2027

Main activities

- **PlaceCraft** will develop a sustainable socio-ecological model of rural placemaking (piloted in 5, showcased in further 10 villages) based on cultural heritage and tourism specifically targeting villages near urban centers in multicultural microregions along Danube: in order to revitalize and create inclusive community spaces, by providing participatory-based hands-on practices for rural cultural and touristic actors.
- Meanwhile this community-led approach will contribute to the regional strategies by:
 - Reconnecting microregions by their cultural heritage
 - Strengthening urban-rural touristic ecosystems

Results

- **PlaceCraft** aims to create a transnational knowledge hub to develop community led placemaking capacities and a strategy for creating integrated urban-rural cultural heritage ecosystems in multicultural microregions, to pilot an art and culture based participatory placemaking methodology to revitalize rural community places, develop a socio-economical placemaking model for rural settlements.
- **An Action Plan** in multicultural rural-urban regions to strengthen integrated sustainable tourism ecosystems will be developed alongside a piloting methodology for urban-rural microregions to reconnect revitalized places and a Toolkit for Rural-Urban Sustainable Tourism Methodologies.

Applicability and transferability of the results

- The project will develop an innovative co-creation model for rural communities in collaboration with local stakeholders. Pilot projects will demonstrate the adaptability and effectiveness of the model, resulting in site-specific strategy packages for long-term place management.
- Lessons learned from the project will be collected into the Handbook of Rural Placemaking for wider dissemination.
- In addition, the project will build capacity through participatory learning and promote the model regionally and inter-regionally to communities and territorial municipalities and their institutions involved in culture and tourism.

Financed through/by

- This project is supported by the Interreg Danube Region Programme co-funded by the European Union

Research Center

- Research Center for Urban Planning and Architecture

Research Team

Project leader:

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Researchers:

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- Assist. Prof. Dr. Arch Stefana BĂDESCU
- Arch. Mihai DANCIU

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DEVELOPMENT OF A COST-EFFECTIVE ANODE FOR PEM WATER ELECTROLYSIS (DC-PEM)

Goal of the project

- The **DC-PEM project** aims to develop a cost-effective anode for PEM water electrolysis by optimizing well-established technologies and reducing material consumption while improving efficiency. By lowering manufacturing costs, the project supports the wider implementation of PEM water electrolyzers for renewable energy storage. In addition, recycling strategies are proposed for production steps and key electrolyzer components to enable a sustainable material life cycle.

Short description of the project

- The project develops titanium-based anodes for PEM water electrolysis with reduced noble metal catalyst loading.

Project implemented by:

• Coordinator:

- Mittweida University of Applied Sciences, Germany (HE)

• Partners:

- Politehnica University Timisoara (HE)

- Fraunhofer-Institut, Dresden, Germany (RES)

- University of Chemistry and Technology Prague, Czech Republic (HE)

- LeanCat, Prague, Czech Republic (SME)

Implementation period:

- 01.07.2023 – 31.10.2026

Main activities

- The project begins with a comprehensive state-of-the-art analysis and definition of technical requirements for advanced anode materials. Porous titanium structures are supplied and optimized through tailored heat-treatment programs and alternative porous metal concepts, followed by detailed material characterization. Surface modification of Ti porous transport layers is achieved through hydridation, enabling improved catalyst immobilization using Ir, Ir-alloys, or IrO₂ nanoparticles via electrochemical deposition techniques.

- The developed anodes are evaluated through structural, chemical, and electrochemical characterization, including half-cell testing and in-operando analysis.

- Recycling strategies are also addressed, focusing on electrochemical recovery of noble metals, electrolyte lifetime extension, and Ti waste recycling. Finally, the optimized anodes are integrated into laboratory-scale MEAs and tested in PEMWE stack prototypes to assess performance and durability.

Results

- The **DC-PEM project** aims to develop cost-effective, durable titanium-based anodes for PEM water electrolysis, thereby advancing green hydrogen technologies aligned with the EU Green Deal. The project focuses on optimizing the porous titanium current collectors and porous transport layers through innovative paper-based manufacturing routes, enabling scalable and low-cost production. In this scope, the catalyst utilization was reduced by applying nanoscale iridium-ruthenium particles via pulse electrodeposition, thereby ensuring efficient OER activity with lower noble metal loading.

- Surface modification through titanium hydridation improved electrical conductivity and reduced contact resistance, offering a more suitable interface for the catalyst particles. Extensive structural, chemical, and electrochemical characterization demonstrated improved corrosion resistance and stability of the developed anodes under acidic operating conditions.

- The electrodes are planned to be further evaluated in membrane-electrode assemblies to assess performance and durability. In addition, recycling strategies for precious metals and titanium components are developed to support sustainable material life-cycle.

Applicability and transferability of the results

- The project results demonstrate that titanium-based anodes with reduced noble metal loading can be applied in PEM water electrolysis systems, contributing to more cost-efficient hydrogen production. The developed approaches for Ti PTL processing, catalyst deposition, and hydridation can be transferred to industrial electrode manufacturing.

- Possible challenges include long-term corrosion stability and catalyst durability under real operating conditions. Future research should focus on extended durability tests, optimization of catalyst distribution, and scale-up of the fabrication processes.

Financed through/by

This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS/CCCDI – UEFISCDI, project number ERANET-M-3-DC-PEM, within PNCDI.

Research Center

- Research Center for the Processing and Characterisation of Advanced Materials

(<https://eertis.eu/errf-2300-000a-1403>)

- Research Institute for Renewable Energy

(<https://eertis.eu/erlb-2400-001p-1602>)

Research Team

Project leader:

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- Prof. Dr. Eng. Corneliu CRĂCIUNESCU

- Assoc. Prof. Dr. Eng. Mircea Laurențiu DAN

- PhD Student Eng. Sebastian AMBRUȘ

- PhD Student Eng. George DIMA

- PhD Student Eng. Raluca BOJÎNCĂ



Fig. 1. DC-PEM Consortium

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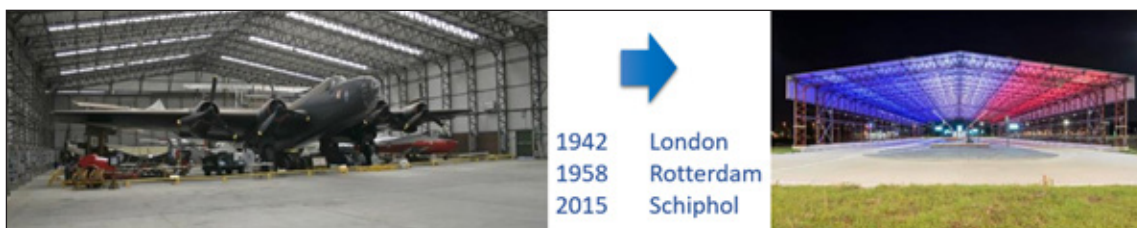
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ACCOMPANYING MEASURE FOR DISSEMINATION, VALORISATION AND COLLABORATIVE EXPLOITATION OF CIRCULARITY OF CONSTRUCTIONAL STEEL PRODUCTS (ADVANCE)

Goal of the project

- The main goal of the **ADVANCE project** is to increase the recovery and reuse of constructional steelwork by providing reliable performance data and guidance. This will be achieved by disseminating the information about the products, systems, methods and protocols that facilitate reuse of various components of constructional steelwork using the tools and methodologies developed within the past activities of the consortium partners.
- The outcomes of the project will include recommendations to enable reuse of building components in-situ or in different location(s), and in the original layout or in a different design with the necessary modifications/adaptations to resist the new external loads (due to the relocation) or internal loads (due to the modification of the structural layout).



Short description of the project

- **ADVANCE project** is RFCS Accompanying Measure that aims to develop and demonstrate circular economy solutions for steel and steel-based components in the construction sector. The project covers different aspects of reuse, such as design, testing, certification, business models, and sustainability assessment, and provides recommendations and best practices for policy makers, industry stakeholders, and researchers.
- The project's ambition is to contribute to greenhouse gas reduction and circular economy goals by addressing these challenges in both deconstruction and reuse of existing steel buildings, and in the design of new buildings, their construction and documentation to facilitate future reuse.
- Its scope includes reuse of constituent products, fabricated components, and reuse of component assemblies. The reused material may originate from primary structures, secondary structures and envelopes.

Implementation period:

- 01.09.2023-31.08.2025

Project implemented by:

- VTT Technical Research Centre of Finland Ltd, Finland
- Politehnica University Timisoara, Romania
- European Convention for Constructional Steelwork, Belgium
- University of Coimbra, Portugal
- RWTH Aachen University, Germany
- Finnish Constructional Steelwork Association, Finland
- Czech Technical University in Prague, Czech Republic
- Industrial Technical Centre of Metal Construction CTICM, France
- Purkupa Group Oy, Finland
- The British Constructional Steelwork Association Ltd, United Kingdom
- Bauforumstahl e.V., Germany
- ArcelorMittal Belval & Differdange S.A., Luxembourg

Main activities

- State-of-the-art of steel components reuse;
- Analysis of the different business models and policies;
- Recommendations for Reuse (EN version);
- Translated Recommendations for Reuse (7 EU languages);
- LCA mobile app and web tool;
- Brochure and Presentation materials;
- Dissemination of results. Workshops.



Results

- Provide guidance for reuse of existing components or structures and design of new ones with improved reusability, introduce recommendations for product / waste status and material testing protocol for recertification of steel products in the Recommendations for Reuse (two volumes);
- Support declaration of the environmental benefits of steel reuse with the methodology to declare LCA beyond the system boundary implemented in the mobile LCA app and web tool;
- Increase awareness about the alternative end-of-life options for constructional steel and steel-based products by sharing information about successful reuse cases and circular business models in 7 workshops;
- Identify the possibilities and roadmaps for scaling up the outcomes of the core background projects beyond their original focus area.

Applicability and transferability of the results

- The aim is to address wider audience in the member states with the focused workshops, localized Recommendations for Reuse, information brochure, mobile app and presentation materials.

Financed through/by

- This work was supported by a grant of the European Research Executive Agency, Topic RFCS-02-2022-AM, project number 101112269 – ADVANCE – RFCS-2022.

Research Center

- Research Center for Materials Mechanics and Structural Safety (CEMSIG), Politehnica University Timișoara

Research Team

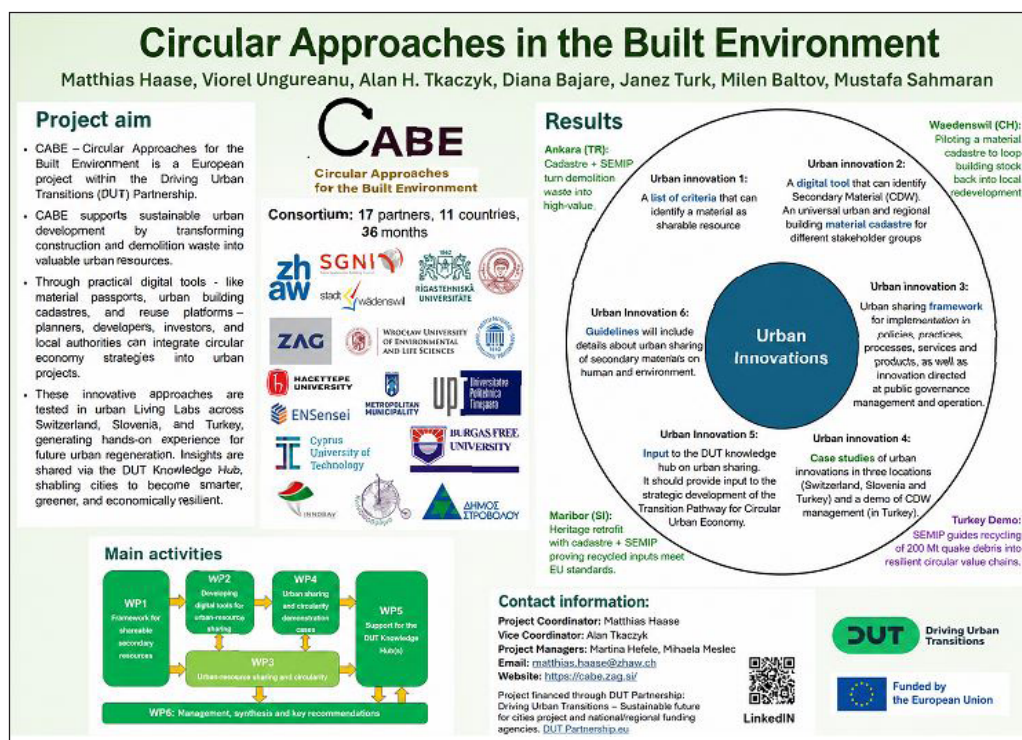
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CABE – CIRCULAR APPROACHES IN THE BUILT ENVIRONMENT



Goal of the project

- CABE aims to develop and pilot innovative urban resource sharing infrastructures and circular solutions for the built environment through the reuse of construction and demolition waste (CDW).
- The project develops digital tools, material cadastres, and material passport frameworks to support circular economy implementation in urban regeneration and sustainable construction.

Short description of the project

- CABE is a European research and innovation project developed within the Driving Urban Transitions Partnership.
- The project promotes circular economy principles in the built environment by transforming construction and demolition waste into valuable secondary resources.
- CABE develops digital tools such as material passports, urban building material cadastres and secondary material information platforms, while validating the proposed approaches through demonstration cases in Switzerland, Slovenia and Turkey.
- The consortium is composed of 17 partners from 11 countries including universities, municipalities, SMEs and research organisations.

Implementation period:

- 01.01.2025-31.12.2027

Project implemented by:

- **Coordinator:** Zurich University of Applied Sciences (ZHAW), Switzerland

Partners :

- Politehnica University Timișoara, Romania
- SGNI, Switzerland
- Hacettepe University, Turkey
- University of Tartu, Estonia
- Cyprus University of Technology, Cyprus
- Wroclaw University of Environmental and Life Sciences, Poland

- Ankara Metropolitan Municipality, Turkey
- ENSensei Engineering & Consulting LC, Turkey
- Werke Stadt Wädenswil, Switzerland
- Slovenian National Building and Civil Engineering Institute, Slovenia
- Aristotle University of Thessaloniki, Greece
- Burgas Free University, Bulgaria
- Kykloikodromio, Cyprus
- Strovolos Municipality, Cyprus
- Riga Technical University, Latvia

Main activities

- Development of frameworks for shareable secondary resources;
- Development of digital tools for urban-resource sharing;
- Creation of material passports and urban material cadastres;
- Development of Secondary Material Information Platform (SEMIP);
- Circularity assessment and socio-economic impact analysis;
- Demonstration cases in Switzerland, Slovenia and Turkey;
- Disaster waste management and recycling demonstrations;
- Dissemination activities, policy briefs and stakeholder engagement.

Results

- Urban innovation framework for circular resource sharing;
- Criteria for identifying shareable secondary materials;
- Digital tools for tracking and reusing construction materials;
- Universal urban and regional building material cadastre blueprint;
- Demonstration of circular economy implementation in urban regeneration projects;
- Guidelines and recommendations for evidence-informed urban sharing;
- Knowledge transfer through DUT Knowledge Hub and scientific dissemination.

Applicability and transferability of the results

- The project results support local authorities, planners, developers and stakeholders involved in urban regeneration and circular economy implementation.
- The developed digital tools, material cadastres and guidelines can be adapted and transferred to different European contexts, supporting sustainable urban development, reduction of construction waste and increased resource efficiency.

Financed through/by

- Driving Urban Transitions (DUT) Partnership and national/regional funding agencies under Horizon Europe related programmes through Ministry of Research, Innovation and Digitization, CNCS/CCCDI -UEFISCDI

Research Center

- Research Center for Materials Mechanics and Structural Safety (CEMSIG), Politehnica University Timișoara

Research Team

Project leader:

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- PhD Student Eng. Kenza BELKHIRI

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ELECTRIC MULTIMODAL TRANSPORT SYSTEMS FOR ENHANCING URBAN ACCESSIBILITY AND CONNECTIVITY (ERANET-ENUAC-E-MATS)

Goal of the project

- This project aims to develop multimodal transport systems by integrating electric public transit and shared micro-mobility for sustainable, efficient, and equitable urban mobility.
- A consortium of research institutions, public authorities, and industry partners from Romania, Sweden, and China will drive electrification, connectivity, and sharing innovations.
- The project focuses on infrastructure planning, system optimization, and vehicle control, ensuring real-life applications that enhance accessibility, climate action, and citizen's well-being.

Short description of the project

- Improving multimodal e-mobility through electrification, connectivity and sharing for sustainable urban transport.
- **Coordinator: Politehnica University Timisoara**, Romania, **Prof. Dr. Eng. Radu-Emil Precup** – director of European coordinator UPT, principal investigator.

Partners:

- **Zhejiang University (ZJU)**, China, Prof. Sheng Jin – director of the project coordinator ZJU.
- **Swedish National Road and Transport Research Institute (VTI)**, Sweden, Dr. David Daniels – director of VTI partner.
- **Chalmers University of Technology (CTH)**, Sweden, Dr. Kun Gao – director of European co-coordinator and partner CTH.
- **Chongqing University (CQU)**, China, Prof. Xiaosong Hu – director of CQU partner.
- **The Hong Kong Polytechnic University Shenzhen Research Institute (PolyU-SZRI)**, China, Dr. Wen Yi – director of PolyU-SZRI partner.
- **WSP Sverige AB (WSP)**, Sweden, Mr. Lars Drageryd – director of WSP partner.
- **FellowBot AB (FellowBot)**, Sweden, Ms. Sida Jiang – director of FellowBot partner.
- **Hangzhou Comprehensive Transportation Center (HZCTC)**, China, Mr. Haiwei Wu – director of HZCTC partner.
- **Enjoyor Ltd Co. (Enjoyor)**, China, Mr. Xiaoyue Wen – director of Enjoyor partner.

Implementation period:

01.05.2024 – 31.12.2026

Main activities

- **1.1.1.** Development of the documentation on project coordination, risk management and quality assurance procedures.
- **1.1.2.** Collecting behavioral data on drivers and developing models of intermodal transport behavior.
- **2.1.1.** Setting up the model for the energy system by adapting the input-output variables to the other models within the intermodal transportation system.

- **2.2.** Development of an optimal model for the transportation route structure that includes loading facilities, demand distribution, traffic schedule management and existing transportation networks.

- **3.1.1.** Development of an algorithm for adaptive speed management to optimization (minimization) of energy consumption, deviation from traffic schedules and battery degradation.

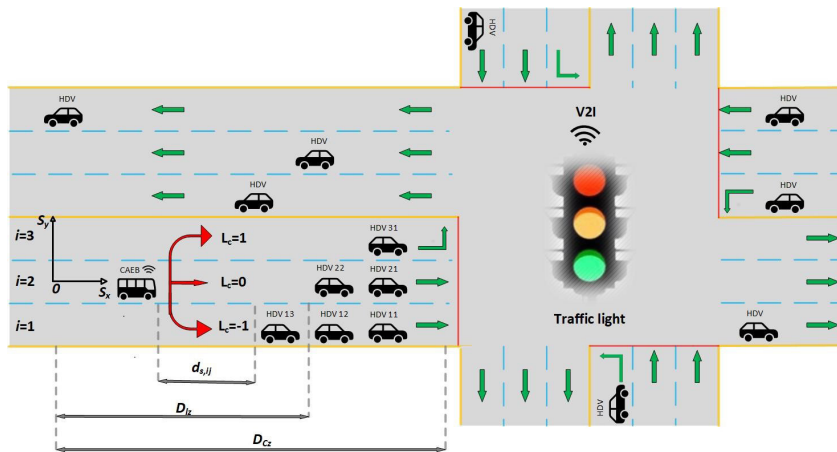
Communication and dissemination of the results obtained in each stage of the project.

Results

- In 2025, the research team published **13 journal papers** indexed in Clarivate Analytics Web of Science (WoS, with one of the previous names ISI Web of Knowledge) ([IEEE TFS\(1\) 2025](#), [IEEE TFS\(2\) 2025](#), [IEEE TCS I 2025](#), [NN 2025](#), [JICV 2025](#), [IS \(1\) 2025](#), [IS \(2\) 2025](#), [TRDTE 2025](#), [IEEE TC 2025](#), [FUME 2025](#), [ROMJIST \(1\) 2025](#), [ROMJIST \(2\) 2025](#), [PRAA 2025](#)), **five papers in conference proceedings** indexed in WoS ([FUZZ-IEEE 2025](#), [SACI \(1\) 2025](#), [SACI \(2\) 2025](#), [SACI \(3\) 2025](#), [ICSTCC 2025](#)), **four papers in conference proceedings** indexed in international databases (IEEE Xplore, INSPEC, Scopus, Sciencedirect, Springer Link, DBLP) ([ECC 2025](#), [SDF 2025](#), [SSSC-TDS-COSY 2025](#), [ICONS 2025](#)), **one book** in CRC Press, Taylor & Francis, and **one book chapter** published in Springer ([ISRL 2025](#)).

Applicability and transferability of the results

- In 2025, the project team developed a mathematical traffic model of an intersection, including several vehicles used to support optimal speed control and multimodal transport planning.
- The model's interoperability with energy-network architectures and information and communication technology (ICT)–based urban mobility systems ensures wide applicability across metropolitan areas seeking to implement efficient electric-transport solutions.



- Future research will focus on the empirical validation of adaptive speed-control frameworks, the integration of the model with real-time ICT platforms, and the advancement of sustainable and equitable mobility strategies in the project's final phase.
- The research team also proposed several controllers, validated using experiments on other laboratory equipment, which will be further validated against the mathematical traffic model.

Financed through/by

- ERANET and UEFISCDI

Research Center

- Research Center for Automatic Systems Engineering- CCISA

Research Team

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- MSc Eng. Agnes STEPANIAN
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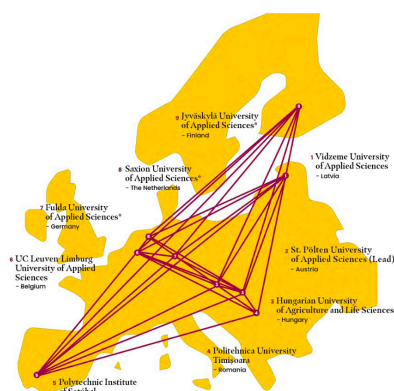
Project Website:

<https://www.aut.upt.ro/~rprecup/e-MATS.html>

ENGAGED AND ENTREPRENEURIAL EUROPEAN UNIVERSITY AS DRIVER FOR EUROPEAN SMART AND SUSTAINABLE REGIONS 2.0 - E³UDRES² 2.0

Goal of the project

- **E³UDRES² 2.0** empowers the further development of **E³UDRES²**, the Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions, to reach a substantial leap in quality, performance, attractiveness and competitiveness of the European University alliance and its individual members. The **E³UDRES²** alliance started from scratch in October 2020 with initially six higher education institutions. The consortium of **E³UDRES² 2.0** unites 10 higher education institutions as well as 36 associated partners. In addition, **E³UDRES² 2.0** establishes enhanced partnerships with universities and their local communities from Western Balkans and the Ukraine.
- **E³UDRES² vision** is to promote Smart and Sustainable Regions (S²-Regions) to shape a peaceful and prosperous European future for responsible citizens as a pioneering full-fledged Engaged and Entrepreneurial European University (E³-Universities).
- **E³UDRES² mission** is to inspire open-minded people to co-create solutions for environmental, societal and economic challenges, support individual learners to unleash their talents and develop future-oriented skills, empower creative Ent-r-e-novators (entrepreneurs, researchers, educators and innovators) and act as an inclusive and engaged platform for collaborative innovation that strengthens a smart and sustainable society.



Implementation period

01.10.2023 – 30.09.2027

Main activities

- **E³UDRES²** strives to enable Smart Learners to unfold talents, empowers ent-r-e-novators (entrepreneurs, researchers, educators, innovators) to accelerate future universities, serves as a platform for collaborative innovation to connect entrepreneurial minds, engages in regional communities to contribute to society and shifts to a fully-fledged European university to ensure excellent quality.
- A major change against the first phase of the alliance is a clear sharing of leading and co-leading roles, to better make use of the existing high-level commitment in all institutions. The project planned to have one lead and two co-lead institutions for every WP:
 - **WP 1** Project Management and Coordination: STPUAS (lead), HFD & ViA (co-leads)
 - **WP 2** Developing Talents: MATE (lead), Saxion & UPT (co-leads)
 - **WP 3** Smart Learners: UCLL (lead), JAMK & MATE (co-leads)
 - **WP 4** Research and Knowledge Serving Users: UPT (lead), HFD & IPS (co-leads)
 - **WP 5** Regional Innovation Hubs: Saxion (lead), STPUAS & UCLL (co-leads)
 - **WP 6** Future University: ViA (lead), HFD & STPUAS (co-leads)
 - **WP 7** Capacity Building: HFD (lead), Saxion & ViA (co-leads)

Short description of the project

The project is one of the 41 university alliances selected for funding as part of the European Commission Initiative towards creating a number of European Universities, that have been approved to enter the second phase of implementation.

Project implemented by:

Coordinator: St. Pölten University of Applied Sciences (STPUAS), Austria

Partners:

- Politehnica University Timișoara (UPT), Romania
- Polytechnic Institute of Setúbal (IPS), Portugal
- Hungarian University of Agriculture and Life Sciences (MATE), Hungary
- University College Leuven, Belgium
- University College Limburg, Belgium
- Vidzeme University of Applied Sciences ViA, Latvia
- Saxion University of Applied Sciences (Saxion), Netherlands
- Fulda University of Applied Sciences (HFD), Germany
- Jyväskylä University of Applied Sciences (JAMK), Finland

- **WP 8** Quality and Evaluation: IPS (lead), JAMK & STPUAS (co-leads)
- **WP 9** Digitalisation and Infrastructure: JAMK (lead), STPUAS & UPT (co-leads)
- **WP 10** Impact and Dissemination: STPUAS (lead), IPS & UCLL (co-leads)

- E³UDRES² co-creates its Multi-i-Campus for flexible learning offering joint lectures, modules, internships, micro-credentials and (European) degrees, a talent funnel for smart learners, a joint support centre, joint doctoral programmes and research centers of excellence, an entrepreneurship and innovation network for S²-Regions, interconnected (pre-)incubators fostering startups and entrepreneurial education, an ecosystem for regional partners and citizens, a proactively operating umbrella organisation as a legal entity and a future university model as an updated E³UDRES² strategy ensuring a fully-fledged European University sustainably implemented beyond 2030.

- In the first three years, E³UDRES² members pooled their expertise and resources into the three Research Networks for Circular Economy, Wellbeing and Active Ageing and Human Contribution to AI, whose thematic orientation shaped the activities for education and innovation, too. With regard to the specific challenges, opportunities and smart specialisation strategies (RIS3) of related regions, the (complementary) strengths and institutional (strategic) interests of its full members and in line with European priorities, missions and policy objectives, E³UDRES² 2.0 further develops and supplements these Research Networks into four future-guiding Focus Areas:

- (1) Health, Wellbeing and Social Inclusion for Regions;
- (2) Digital Solutions and (Applied) Deep Tech for Regions;
- (3) Resilient Economy and Innovation for Regions;
- (4) Creative Industries for Region's Identity.

- These Focus Areas constitute a development of the existing Research Networks, in that they stronger integrate not only research but also education and innovation activities on specific thematic areas based on the needs of the regions and on the main societal and economical challenges and convey efforts and developments along main common paths – be it education-related activities, RDI undertakings, excellence initiatives or innovation pools.

Results

- E³UDRES² 2.0 tracks its progress through 20 Core KPIs, targeting 50,000 benefitting students, 360 E³UDRES²-labelled learning activities (including 20 jointly developed activities), 50 associated start-ups/spin-offs, 200 regional solutions, 70 services for/with society, and 450 submissions to the E³UDRES² Awards of Excellence.
- In 2025, the alliance held two key international summits.

- The **E³UDRES² Spring Summit 2025**, hosted by Saxion University of Applied Sciences in Enschede, the Netherlands (17–21 March), featured a Stakeholders Forum, a Science Festival, keynote speeches, panel discussions, Focus Tables, onsite visits, and meetings of the main governance bodies.

- The **E³UDRES² 2.0 Autumn Summit**, organized by the Polytechnic University of Setúbal, Portugal (22–26 September 2025), focused on the strategic development of the alliance and included governance meetings, a Scientific Council meeting, a Citizen Science Workshop, and thematic panel discussions.

- Several bilateral working meetings were also organised:

- **January 2025**: visit of a delegation from UCLL lead by Roger Heijmans, to discuss further development of short courses and of the Talent Funnel application

- **October 2025**: visit of Michal Karpishek (E³UDRES² Association General Secretary) and Klaas Vansteenhuyse (Director of Learning), to discuss further plans of the Alliance beyond the E³UDRES² 2.0 project.

- UPT contributed to the alliance through its involvement in the development of the digital platform **E³UDRES² ARENA**, supporting collaboration, learning, and innovation within the consortium.

As a result of his contribution to the development of the IT platform, Dr. Andrei Ternauciu has been awarded by UPT with the **2025 E³UDRES² Award of Excellence**.

Further details regarding this award are presented in the Research Report 2025 (the present report), in the chapter **Scientific Excellence Awards**.

Applicability and transferability of the results

E³UDRES² 2.0 also integrates HEIs from Western Balkans and Ukraine as associated partners in order to establish an enhance partnership and to successfully transfer project's results:

- University of Shkodra Luigj Guraku (USLG) / Albania
- University of Applied Sciences in Ferizaj (UASF) / Kosovo
- Aleksander Moisiu University of Durres (AMUD) / Albania
- Bohdan Khmelnytsky National University at Cherkasy (BKNUC) / Ukraine
- Cherkasy State Business College (ChSBC) / Ukraine
- Sumy State University (SSU) / Ukraine

- The project also aims to develop further co-operation applications under Horizon Europe, Erasmus+ KA2, Erasmus-LS-CBHE, EIT-HEI, Marie Curie doctoral consortiums and other international funded calls.

Financed through/by

European Commission, ERASMUS-EDU-2023-EUR-UNIV

Research Team

Project leader

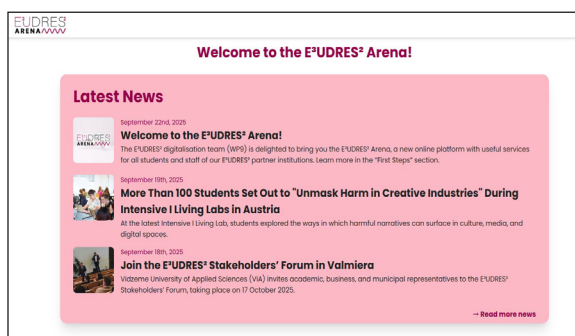
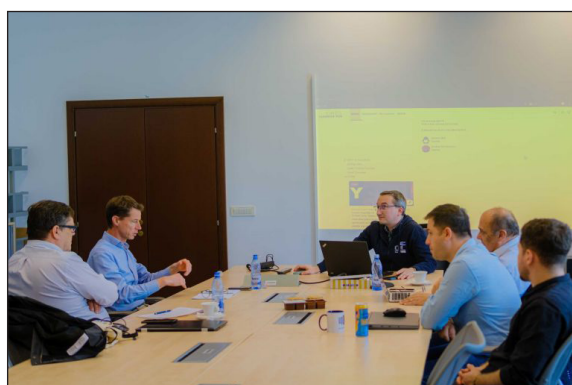
– Assoc. Prof. Dr. Eng. Florin DRĂGAN

Project coordinator:

– Prof. Dr. Eng. Radu VASIU, Director Institute for Digital Transformation, Director Research Center for Multimedia

Researchers:

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- Stud. Adrian-Mihai Popescu



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LECTURE - INTRODUCING LEADING EUROPEAN COMPETENCES APPROACH INTO TEACHER TRAINING CURRICULUM FOR UKRAINE'S RESILIENT

Goal of the project

- The **LECTURE project** will realise its ambition to support Ukrainian HE institutions to increase their resilience during the hard challenges they are facing, through an interdependent, highly participative work programme, that will elaborate a methodology concept fostering exchange of knowledge and innovation, identifying, defining and specifying four competences, including the elaboration of the Standard.
- The development of the Standard of LECTURE presents a comprehensive legacy framework, supporting transferability and sustainability in a long-term perspective.

Short description of the project

- The **LECTURE project**, part of the European Crossborder HE cooperation priority of the EU is aimed at introducing leading European competences into teacher training Standard to ensure Ukraine's resilience.
- Higher Education within the project strengthens the integration of Ukraine's education into the European education area, implements European principles of the educational process in HEIs, expands the content of learning, explains the requirements for mandatory learning outcomes and benchmarks for their assessment. The list of key competencies and cross-cutting skills of future teachers included in the Standard is based on the experience of the European Union and the recommendations of the European Parliament and the Council of the European Union on the formation of key educational competencies.

Project implemented by:

Coordinator:

Università degli Studi di Roma Tor Vergata, Italy

Partners:

- Politehnica University Timisoara, Romania
- Tartu Ülikool, Estonia
- Universitat de Les Illes Balears, Spain
- EDEN Digital Learning Europe
- 13 Universities from Ukraine

Implementation period

01.11.2024 – 31.10.2027

Main activities

- The project activities include an extensive dissemination campaign, outreach courses, guidelines, recommendations, and the support from the Ukrainian Ministry of Education in order to ensure the process of modernising the training of future teachers of Ukraine in the post-war period in accordance with the European

standards.

The projects' work packages are:

- **WP1:** Management, quality control, evaluation and coordination activities
- **WP2:** Standard of higher education in speciality 014 Secondary education for BA students majoring in the Ukrainian Language, Mathematics and History
- **WP3:** Competences development skill toolbox
- **WP4:** Centre of Excellence for Teacher's Competences
- **WP5:** Dissemination and Sustainability

UPT is mainly **interested in WP3**, regarding competences and skills, where it acts as WP lead.

- The main objectives of this WP are:

- to study the EU experience of higher pedagogical education, models of BA teacher training, to analyze the competences of modern teachers in Europe;
- to define the gap in the scope and levels of competences of Ukrainian and EU teachers;
- to identify challenges for higher teacher education in Ukraine, priorities in teacher training, and the potential of the EU approach for Ukraine's sustainability and post-war recovery;
- to develop a framework of competences integral, general and professional BA students of higher pedagogical education of speciality 014 Secondary Education;
- to develop a list of subject competences of future BA students majoring in the Ukrainian Language, Mathematics and History.
- to undergo the approval procedure for the Standard and implement it in the educational practice of teacher training at the bachelor's level of higher education in Ukraine;
- to elaborate Guidelines for the development and improvement of educational programmes in the speciality 014 Secondary Education, field of study 01 Education/Pedagogy for the first (bachelor's) level of higher education.

Results

- A study visit took place between 09 - 12 December 2025 in Timișoara and was intended for an estimated number of 20 participants from the academic staff of 8 Ukrainian partners.
- The study visit to Romania is an essential component of **WP3 (Competences development skill toolbox)**, managed by UPT. This stage of the **LECTURE project** aims at transferring European expertise to the Ukrainian partners, focusing specifically on the development of digital, inclusive, psychological and information competences of teachers.
- The main objective was:
 - Deepening the best practices of EU universities (Romania) in implementing teacher training programs, with an emphasis on teachers' information and digital competences.
- Activities: The program included theoretical sessions such as presentations and group activities, as well as practical afternoon sessions involving school visits and meetings with teachers.
- Topics Covered: Thematic sessions covered key topics such as ABC to Learning Design and Digital Competencies, Open Tools and Open Badges, the use of Artificial Intelligence (AI) in teaching, teacher training strategies in Romania, and MOOCs & Blockchain.

Applicability and transferability of the results

- To provide sustainability outside the project, the Consortium will seek for support on the side of national financial institutions, businesses, etc. The synergy of the project is in the following factors:
 - Encouraging the modernization of higher education at the national level;
 - Shaping professional pedagogical competencies, ones for better training of prospective teachers of different subjects;
 - Working out proposals for the improvement of the legislation and other norms on Pedagogical Education;
 - The developments and achievements resulting from the project can lay the foundation for new projects for improved pedagogical training, particularly for forming professional competencies.
 - The project results can be valuable and will be taken into account when developing standards for the (master's) level of higher education and will become the basis for the formation of competences of future teachers at this level of higher education.

Financed through/by

- European Commission, Digital Europe Programme (DIGITAL)
- ERASMUS-EDU-2024-CBHE
- European Health and Digital Executive Agency (HADEA)

Research Center

Research Center for Multimedia

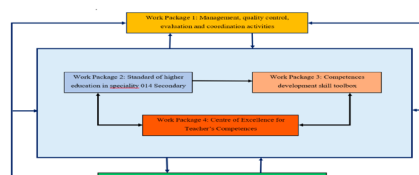
Research Team

Project leader:

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- Assoc. Prof. Dr. Eng. Muguras MOCOFAN
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PROJECTS SUPPORTED BY PRIVATE FUNDS

THEORETICAL AND APPLIED RESEARCH REGARDING PHOTOVOLTAIC, HYDRO POWER-PLANTS AND CONSUMERS' INTEGRATION IN COMPLEX POWER SYSTEMS. CASE STUDIES FOR THE ROMANIAN POWER SYSTEM: PHOTOVOLTAIC POWER PLANTS BUZOIESTI (305 MW), (...) , FROM DEER DISTRIBUTION SYSTEM OPERATOR; CAINENI HYDRO POWER-PLANT (29.776 MW) FROM DEO – OLTENIA ENERGY DISTRIBUTION SYSTEM OPERATOR

Goal of the project

• Currently, there is a very increased interest for unconventional power producers' integration in the Romanian National Power System. The project deals with power system analysis and optimization for the photovoltaic sources (PV), hydro power-plants and consumer integration in the Romanian Power System. The central, North-Western and Southern areas have been used as case studies. The corresponding distribution networks are managed by the DEER Distribution System Operator (DSO), Oltenia Energy DSO, respectively Transelectrica Transmission System Operator.

• The **goal of the project** is to perform the power system operating conditions analysis in order to integrate within the Romanian Power System the following PV power producers: Buzoiesti (rated power 305 MW), Apahida (rated power 5.2 MW), Bontida (rated power 5.8 MW) and Campenesti (rated power 31 MW), respectively Caineni Hydro Power-Plant (rated power 29.776 MW) and Holcim consumer (rated power 144 MW).

Short description of the project

• The unconventional power producers represent an important issue for the Romanian and EU energy policy and sustainable development strategy.

• The project refers to photovoltaic power sources integration in the North and South Transylvania, respectively Oltenia areas of the Romanian Power System. Various scenarios considering the consumption forecast for 2028 and 2033 years have been considered, taking into account all the renewable energy sources (wind, photovoltaic, biomass, hydro).

• The analyses have been performed for the transmission and distribution networks from the interest areas to highlight the influence of the new power producers on the distribution and transmission network.

Project implemented by

• Coordinator:

- Politehnica University Timisoara

• Partners:

- S.C. Romproiect Electro S.R.L., Cluj-Napoca

Implementation period

10.II.2025 – 09.V.2025

Main activities

- Modeling all the unconventional power producers that must be taken into consideration for the involved power system area;
- Power system operating conditions analysis considering various scenarios;
- North and South Transylvania, respectively Oltenia areas transmission and distribution networks modelling and power system operating conditions analysis;

- Steady-state power system analyses;
- Contingencies analyses for the power systems area where the new unconventional power producers are going to be integrated;
- Voltage regulation and reactive power variation analysis;
- Transient stability analyses;
- Analysis of the transmission or distribution electrical network reinforcement necessity.

Results

- Methodology elaborated for unconventional power producers' integration;
- Artificial intelligence based power flow computing algorithms development;
- Power flow computing corresponding to the 2028 and 2033 years forecasting scenarios (transmission and distribution network levels), considering the absence / presence of the new unconventional power producers;
- Voltage value variation considering the absence / presence of the new unconventional power producers;
- Power flow through the power system elements and loading level;
- Analysis of the new power producers' influence on the technical losses;
- Analysis of the new power producers' influence on the technical losses;
- Contingencies analyses considering the presence / absence of the new unconventional power producers;
- Network integration solution validation and electrical network reinforcement recommendations (if necessary).

Applicability and transferability of the results

- Applicability for unconventional power producers' integration in actual, complex, power systems.

Knowledge transfer to other photovoltaic power plants developers, respectively to the electrical distribution network operators (Electrical Networks Banat Distribution System Operator, DEO, DelGaz Grid, DEER) and to the transmission system operator.

Financed through/by

- Private sources
(S.C. Romproiect Electro S.R.L., Cluj-Napoca)

Research Center

- Research Centre for Power Systems Analysis and Optimization
(<https://eertis.eu/errf-2300-000u-1365>)

Research Team

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3D SCANNING, DIMENSIONAL CONTROL AND AUTOMATIC REINFORCEMENT OF ZINC COMPONENTS

Goal of the project

- The project aims to restore and reinforce architectural zinc components by combining high-precision 3D scanning, CAD modelling and composite reinforcement techniques.
- The objective is to reproduce the original geometry while improving structural rigidity and mechanical resistance without altering the aesthetic and historical authenticity of the element.

Short description of the project

- 3D scanning and composite reinforcement of decorative zinc elements.

Project implemented by

- Coordinator:

Politehnica University Timisoara

Partners:

- Industrial partner SC MDG ART BUILDING STRUCTURE SRL

Implementation period

- 12.09.2025 – 01.05.2026

Main activities

- The project involved high-precision 3D scanning of the zinc element using optical metrology equipment, CAD reconstruction of the digital mesh model, experimental development of forming matrices, surface preparation and cleaning of the zinc sheet, structural alignment using carbon reinforced rods and longitudinal beams, preparation of fiberglass layers, and reinforcement of the zinc sheet using composite materials and epoxy resins applied in controlled layers.

Results

- The project produced a complete CAD model of the zinc ornament obtained through 3D scanning, dimensional analysis of the original geometry and a reinforced structural solution using fiberglass and resin composites.
- The process improved rigidity, mechanical resistance and dimensional stability while preserving the aesthetic characteristics of the original decorative element.

Applicability and transferability of the results

- The developed methodology integrates 3D scanning, CAD modelling and composite reinforcement techniques for restoration of metallic architectural elements.
- The approach can be applied to similar heritage restoration projects and provides a reproducible engineering workflow for improving durability and structural stability.

Financed through/by

- Economic agent – research contract with third party (CTR BC69 / 12.09.2025)

Research Center

- Research Center for Mechatronics and Robotics

Research Team

Project leader:

- Assoc. Prof. Dr. Eng. Dorel BUNCIANU

Researchers:

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- Assoc. Prof. Dr. Eng. Dan Teodor MARGINEANU
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ENERGY MANAGEMENT SERVICES FOR MOSNITA NOUA COMMUNE

Goal of the project

- The project's goal is to optimize Mosnita Noua Commune's energy use and increase energy efficiency.
- This will result in lower costs, less of an impact on the environment, and more sustainable local energy consumption.

Short description of the project

- The project involves the assessment, planning, and implementation of energy management strategies for public infrastructure in Mosnita Noua.
- It includes energy audits, efficiency improvement measures, and the integration of renewable energy sources where feasible.

Project implemented by:

- **Coordinator:** Politehnica University Timisoara
- Research Institute for Renewable Energy (ICER)

Implementation period

- 20.05.2024-31.12.2028

Main activities

- Develop energy efficiency improvement program
- Update energy efficiency improvement program
- Develop executive reports on the impact of energy costs
- Develop Plans to increase the number of nZEB buildings

Results

- Improved energy efficiency in public infrastructure
- Reduced energy costs for the local administration
- Lower greenhouse gas emissions
- Increased awareness and capacity of local authorities regarding energy management
- Feasibility studies for renewable energy implementation

Applicability and transferability of the results

- The results of this project can serve as a model for other rural and urban communities aiming to enhance their energy efficiency.
- The methodologies and strategies developed can be adapted and applied to similar municipalities, contributing to sustainable development on a broader scale.

Financed through/by

- Moșnița Nouă Commune, Timiș, Romania

Research Center

- Research Institute for Renewable Energies (ICER)
(<https://www.icer.ro/en/>)

Research Team

Project leader:

- Assoc. Prof. Dr. Eng. Attila SIMO

Researchers:

- Prof. Dr. Eng. Nicolae MUNTEAN
- Assoc. Prof. Dr. Eng. Attila SIMO
- Assoc. Prof. Dr. Eng. Florin MOLNAR-MATEI
- Assoc. Prof. Dr. Eng. Ciprian ȘORÂNDARU
- Assoc. Prof. Dr. Eng. Simon-Alexandru PESCARI
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RESEARCH SERVICES REGARDING THE ENERGY VALORIZATION OF BIOGAS PRODUCED FROM THE ANAEROBIC DIGESTION OF SLUDGE, AT THE TIMISOARA WASTEWATER TREATMENT PLANT

Goal of the project

- **The main objective** of this research is to use the data from the experimental campaign to conduct a feasibility study for the implementation of a biogas production and recovery facility at the Timișoara wastewater treatment plant.
- **The secondary objective** is to experimentally test at least eight co-substrate recipes for biogas production through anaerobic digestion.
- These recipes will combine sludge from the wastewater treatment plant with organic waste and high organic load wastewater from local agri-food industry companies.
- **The specific aim** of the research in 2025 was to highlight the biogas production potential from specific samples. The analysis and experiments conducted in the laboratory were aimed at determining the biogas production capacity of the sludge resulting from the wastewater treatment process.
- The specific biogas production of the analyzed samples is correlated with the content of volatile/organic solids (VS) in the composition of the samples.

Short description of the project

- The analysis and experiments conducted in the laboratory aimed to assess the biogas production potential of sludge from the wastewater treatment process.
- The specific biogas yield of the samples is correlated with the volatile solids (VS) content, which represents the organic matter in the samples.
- For biogas production, two high-precision laboratory reactors were used, manufactured by Bioprocess-Control:
 - 1 Bioreactor Simulator BRS III with 6 bioreactors (2 liters each) and
 - 1 Continuous Stirring Reactor (CSTR) with a single 5-liter bioreactor.

The samples analyzed combined:

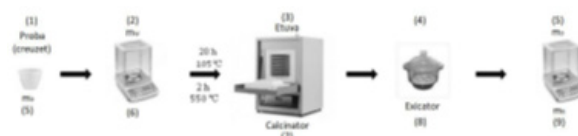
- **Dewatered sludge (probe A)** - from the addition of electrolytes for coagulating excess sludge from the gravitational settling tanks, followed by a centrifugation;
- **Dewatered sludge (probe B)** - collected from a specific landfill;
- **Fats (probe C)** - collected from the grit and grease removal station.

Project implemented by:

- **Service provider:** Politehnica University Timisoara
- **Beneficiary:** AQUATIM SA

Implementation period

- September 2024 - January 2026



Experimental reactors used for the experiments and the schematic flow for the batch preparation

Main activities

- **Collection:** Sludge samples were collected from the wastewater treatment process, ensuring a representative mix of different types of sludge (e.g., primary, secondary);
- **Dewatering:** Some samples underwent dewatering to adjust the moisture content and concentrate the organic material, making it more suitable for anaerobic digestion;
- **Mixing with Co-substrates:** In certain cases, the sludge was combined with organic waste or wastewater from local industries with high organic load, following predefined co-substrate recipes;
- **Standardization:** The samples were standardized in terms of volatile solids (VS) content, ensuring that each sample had a consistent and measurable amount of biodegradable organic matter for the experiments;
- **Inoculation:** To initiate the anaerobic digestion process, samples were inoculated with digestate from a previous fermentation cycle, ensuring the presence of active microorganisms.
- These preparation steps were designed to ensure that the samples were well-suited for the experimental conditions and could provide reliable data for assessing biogas production potential.

Applicability and transferability of the results

1. The research conducted aims to valorize residues from AQUATIM's technological processes for biogas production. The innovation and transferability are found in the developed formulations.

Based on the experimental data, the following conclusions were drawn:

2. **Energy Recovery Potential:** Sewage sludge from the Timișoara WWTP, particularly dewatered sludge (28% TS) and fats, can be used for biogas production through anaerobic digestion, followed by energy recovery in combined heat and power (CHP) systems.

3. **Methane Content and Fuel Quality:** The biogas obtained from co-digestion of the sludge (sample D = A + B + C) showed a methane content of 48–60%, making it suitable for use as a gaseous fuel in diesel engines for CHP systems commonly used in industrial biogas applications.

4. **Low Biogas Yield from Cenei Sludge:** Samples B1, B2, and B3 from dewatered sludge at Cenei showed very low biogas production ($0.116 \text{ NmL} \cdot \text{h}^{-1} \cdot \text{gVS}^{-1}$), despite high TS and VS content.

This suggests that the volatile solids in the Cenei sludge are poorly biodegradable, making it unsuitable for anaerobic digestion.

5. **Comparison with Literature:** While the literature suggests a typical biogas yield of $350 \text{ m}^3/\text{tVS}$ for municipal sewage sludge, the experimental results for sample A were much lower ($3.57 \text{ m}^3/\text{tVS}$), indicating suboptimal substrate characteristics or process conditions.

Financed through/by

Research contract funded by the beneficiary economic agent

Research Center

Research Center for Machines and Thermal Equipment, Transportation, and Pollution Control,

Web: <http://mettcp.mec.upt.ro/>

Research Team

Project leader:

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Researchers:

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ANALYSES AND INVESTIGATIONS ON MATERIALS AND COMPONENTS FROM THE PRODUCTION PROCESS

Goal of the project

- Structural analysis and mechanical testing of materials and components used in production of heating elements and systems, in order to optimize the material selection criteria for processing tools and devices as well as the final products.

Short description of the project

- The project consisted in analyzing and testing of the materials and components used in the production of heating elements and setting criteria for selection of these materials.

Project implemented by:

Politehnica University Timisoara

Implementation period

September 30, 2024-September 29, 2025

Main activities

- Structural analysis and hardness testing of cold working tools in different heat treatment states;
- Structural analysis and hardness testing of stainless steels used in the manufacture of tubular heaters;
- Establishing the influence of the manufacturing process parameters on the structure and properties of steels used in the tubular heaters production;
- Optimizing the material selection criteria for the production of tubular heaters

Results

- It has been optimized the material selection for the production of tubular heaters elements in order to reduce the scrap.

Applicability and transferability of the results

- The results obtained help design engineers to optimize the selection of materials in order to increase products quality and reduce the scrap

Financed through/by

- SC ZOPPAS INDUSTRIES ROMANIA SRL

Financed through/by

- Research Center for the Processing and Characterization of Advanced Materials

Research Team

Project leader:

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Researchers:

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THEORETICAL AND APPLIED RESEARCH REGARDING THE PHOTOVOLTAIC AND WIND POWER PLANTS' INTEGRATION IN COMPLEX POWER SYSTEMS. CASE STUDIES FOR THE ROMANIAN POWER SYSTEM: WIND POWER PLANT BANAT (614 MW), RESPECTIVELY VARADIA (114.3 MW), PHOTOVOLTAIC POWER PLANTS VRANI (198 MW), SATCHINEZ 2 (2.06 MW), PISCHIA EY (4.95 MW), PISCHIA VT (4.95 MW), ILIA (36.3 MW), RESPECTIVELY PALTINIS (45.2 MW) FROM PUBLIC POWER CORPORATION (PPC), ELECTRICAL NETWORKS BANAT DISTRIBUTION SYSTEM OPERATOR

Goal of the project

- Currently, there is a very increased interest for unconventional power producers' integration in the Romanian National Power System. The project deals with power system analysis and optimization for the photovoltaic (PV) and wind power sources' integration in the Romanian Power System (Banat area Distribution System Operator). The Western part of Romania (named Banat area) has been used as case study. The corresponding distribution network is managed by the Electrical Networks Banat Distribution System Operator.
- The goal of the project is to perform the power system operating conditions analysis in order to integrate within the Romanian Power System the following PV power producers: Vrani (rated power 198 MW), Satchinez 2 (rated power 2.06 MW), Pischia EY (rated power 4.95 MW), Pischia VT (rated power 4.95 MW), Ilia (rated power 36.3 MW) and Paltinis (rated power 45.2 MW), respectively wind power producers Banat (rated power 614 MW) and Varadia (rated power 114.3 MW).

Short description of the project

- The unconventional power producers represent an important issue for the Romanian and EU energy policy and sustainable development strategy.
- The project refers to photovoltaic and wind power sources integration in the Western area of the Romanian Power System. Various scenarios considering the consumption forecast for 2028 and 2033 years have been considered, considering all the renewable energy sources (wind, photovoltaic, biomass, hydro).
- The analyses have been performed for the transmission and distribution networks from the interest area, in order to highlight the influence of the new power producers on the distribution network.

Project implemented by:

- **Coordinator:**
 - Politehnica University Timisoara
- **Partner:**
 - S.C. Electroechipament Industrial S.R.L., Resita

Implementation period

- 10.II.2025 – 09.V.2025

Main activities

- Modeling all the unconventional power producers that have to be taken into consideration for the involved power system area;
 - Power system operating conditions analysis considering various scenarios;
 - Banat area distribution network modelling and power system operating conditions analysis;

- Steady-state power system analyses;
- Contingencies analyses for the power systems area where the new unconventional power producers are going to be integrated;
- Voltage regulation and reactive power variation analysis;
- Transient stability analyses;
- Analysis of the transmission or distribution electrical network reinforcement necessity.

Results

- Methodology elaborated for unconventional power producers' integration;
- Artificial intelligence based power flow computing algorithms development;
- Power flow computing corresponding to the 2028 and 2033 years forecasting scenarios (transmission and distribution network levels), considering the absence / presence of the new unconventional power producers;
- Voltage value variation considering the absence / presence of the new unconventional power producers;
- Power flow through the power system elements and loading level;
- Analysis of the new power producers' influence on the technical losses;
- Contingencies analyses considering the presence / absence of the new unconventional power producers;
- Network integration solution validation and electrical network reinforcement recommendations (if necessary).

Applicability and transferability of the results

- Applicability for unconventional power producers' integration in actual, complex, power systems.
- Knowledge transfer to other photovoltaic power plants developers, respectively to the electrical distribution network operators (Electrical Networks Banat Distribution System Operator, DEO, DelGaz Grid, DEER) and to the transmission system operator.

Financed through/by

- Private sources
(S.C. Electroechipament Industrial S.R.L., Resita)

Research Center

- Research Centre for Power Systems Analysis and Optimization
(<https://eertis.eu/errf-2300-000u-1365>)

Research Team

Project leader:

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Researchers:

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- PhD Student Eng. Alexandru STOIAN
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THEORETICAL AND APPLIED RESEARCH REGARDING THE PHOTOVOLTAIC AND WIND POWER PLANTS' INTEGRATION IN COMPLEX POWER SYSTEMS. CASE STUDIES FOR THE ROMANIAN POWER SYSTEM: PHOTOVOLTAIC POWER PLANTS IANOVA GREEN ENERGY MOSNITA1 (4.475 MW), (...)MARGINA (49.8 MW) FROM PUBLIC POWER CORPORATION (PPC), ELECTRICAL NETWORKS BANAT DISTRIBUTION SYSTEM OPERATOR

Goal of the project

- Currently, there is a very increased interest for unconventional power producers' integration in the Romanian National Power System. The project deals with power system analysis and optimization for the photovoltaic (PV) and wind power sources' integration in the Romanian Power System (Banat area Distribution System Operator). The Western part of Romania (named Banat area) has been used as case study.
- The corresponding distribution network is managed by the Electrical Networks Banat Distribution System Operator.
- **The goal of the project** is to perform the power system operating conditions analysis in order to integrate within the Romanian Power System the following PV power producers: Ianova Green Energy Moșnița 1 (rated power 4.475 MW), Mosnita Veche Green Energy Ianova (rated power 4.475 MW), Mosnita Veche Green Energy Ortisoara (rated power 4.475 MW), Voiteg (rated power 4.65 MW), Varfurile (rated power 41.6 MW), Secusigiu (rated power 39.9 MW), respectively Margina (rated power 49.8 MW).

Short description of the project

- The unconventional power producers represent an important issue for the Romanian and EU energy policy and sustainable development strategy. The project refers to photovoltaic and wind power sources integration in the Western area of the Romanian Power System.
- Various scenarios considering the consumption forecast for 2028 and 2033 years have been considered, considering all the renewable energy sources (wind, photovoltaic, biomass, hydro).
- The analyses have been performed for the transmission and distribution networks from the interest area, in order to highlight the influence of the new power producers on the distribution network.

Project implemented by:

- **Coordinator:**
 - Politehnica University Timisoara
- **Partner:**
 - S.C. Electroechipament Industrial S.R.L., Resita

Implementation period

01.XI.2025 – 31.I.2026

Main activities

- Modeling all the unconventional power producers that have to be taken into consideration for the involved power system area;
- Power system operating conditions analysis considering various scenarios;
- Banat area distribution network modelling and power system operating conditions analysis;

- Steady-state power system analyses;
- Contingencies analyses for the power systems area where the new unconventional power producers are going to be integrated;
- Voltage regulation and reactive power variation analysis;
- Transient stability analyses;
- Analysis of the transmission or distribution electrical network reinforcement necessity.

Results

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- Voltage value variation considering the absence / presence of the new unconventional power producers;
- Power flow through the power system elements and loading level;
- Analysis of the new power producers' influence on the technical losses;
- Contingencies analyses considering the presence / absence of the new unconventional power producers;
- Network integration solution validation and electrical network reinforcement recommendations (if necessary).

Applicability and transferability of the results

- Applicability for unconventional power producers' integration in actual, complex, power systems.
Knowledge transfer to other photovoltaic power plants developers, respectively to the electrical distribution network operators (Electrical Networks Banat Distribution System Operator, DEO, DelGaz Grid, DEER) and to the transmission system operator.

Financed through/by

- Private sources (S.C. Electroechipament Industrial S.R.L., Resita)

Research Center

- Research Centre for Power Systems Analysis and Optimization
• <https://eertis.eu/errf-2300-000u-1365>

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DEVELOPMENT OF CAD/CAM TECHNOLOGIES WITHIN OECHSLER ROMANIA SRL

Goal of the project

- The project aims to develop and optimize CAD/CAM technologies within **Oechsler Romania SRL** through the integration of advanced digital design, simulation, and manufacturing methodologies. The research focuses on improving product development efficiency, machining accuracy, production flexibility, and the overall digitalization of industrial manufacturing processes.
- Within **Oechsler Romania SRL**, the **VERO VISI CAD/CAM platform** was implemented to support the digital integration of design and manufacturing activities. The system enabled advanced CAD modeling, CAM programming for CNC milling operations, and efficient preparation of EDM manufacturing processes.
- The implementation of **VERO VISI** contributed to improved machining accuracy, reduced programming time, optimized toolpath generation, and better communication between engineering and production departments. The platform also supported the standardization of manufacturing workflows and increased the level of automation and digitalization within the company's production environment.

Short description of the project

- The project focused on the integration of CAD/CAM technologies with CNC milling and EDM manufacturing equipment within Oechsler Romania SRL.
- The implemented digital workflow enabled the transfer and optimization of machining data between design and production stages, improving process efficiency, machining accuracy, production monitoring, and manufacturing automation.
- The research also supported the digitalization and modernization of industrial production processes.

Project implemented by:

- **Coordinator:**
- Politehnica University Timisoara

Implementation period

October – December 2025

Main activities

- Analysis of existing CAD/CAM and CNC manufacturing infrastructure
- Integration of CNC milling and EDM machines with the CAD/CAM system
- Development and optimization of digital manufacturing workflows
- Preparation and validation of CAM machining programs
- Testing and optimization of machining parameters and production processes

- Implementation of data transfer and communication procedures between design and manufacturing systems
- Monitoring and evaluation of manufacturing performance, accuracy, and process efficiency
- Technical documentation and reporting of research and implementation results

Results

- Successful integration of CNC milling and EDM equipment with the CAD/CAM system within Oechsler Romania SRL
- Improved digital communication between design and manufacturing processes
- Optimization of machining workflows and reduction of programming and setup time
- Increased machining accuracy and process reliability
- Enhanced production efficiency through better process automation and data management
- Development of standardized digital manufacturing procedures and technical documentation
- Support for the digitalization and modernization of industrial production activities

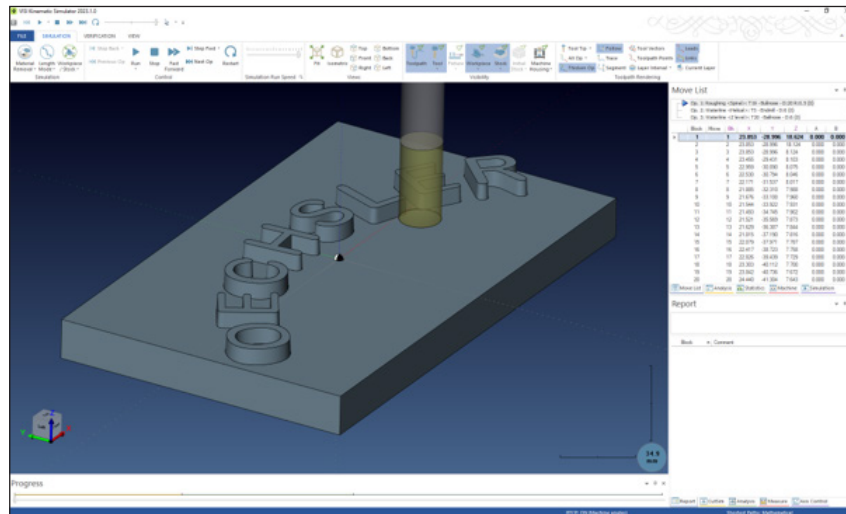


Fig. 1. 3D model of the analyzed part

Applicability and transferability of the results

- The developed CAD/CAM integration solutions can be applied to various industrial manufacturing environments using CNC milling and EDM technologies.
- The implemented digital workflows, machining strategies, and data transfer procedures are transferable to other production systems and can support process standardization, manufacturing optimization, and industrial digitalization.
- The results may also be extended to advanced Industry 4.0 manufacturing applications and integrated smart production environments.

Financed through/by

- Private sources

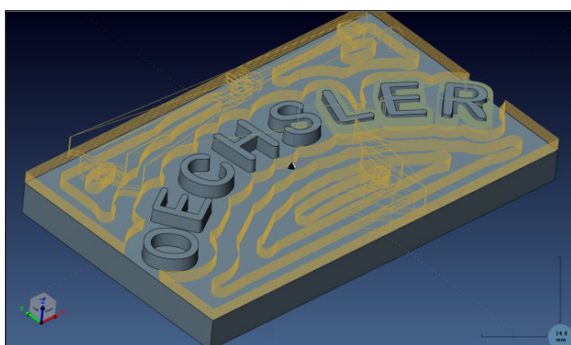


Fig. 2. CNC machining toolpaths of the part

Research Center

- Research Centre for Engineering and Management

Research Team

Project leader:

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GRANTED PATENTS

INVENTORS: PĂCURARIU CORNELIA SILVIA, CĂPRARU AYLIN DIANA, IANOȘ ROBERT GABRIEL, LAZĂU RADU IOAN

PATENT NO. RO 134214 B1/ 2025

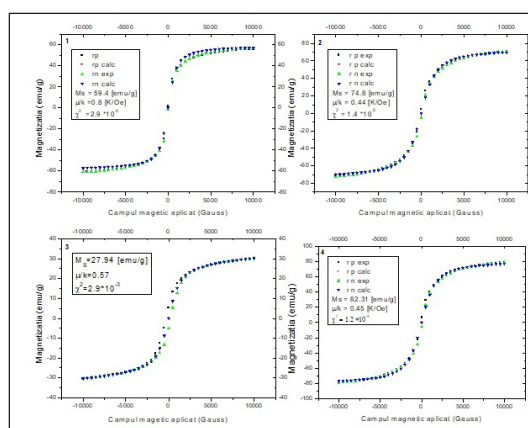
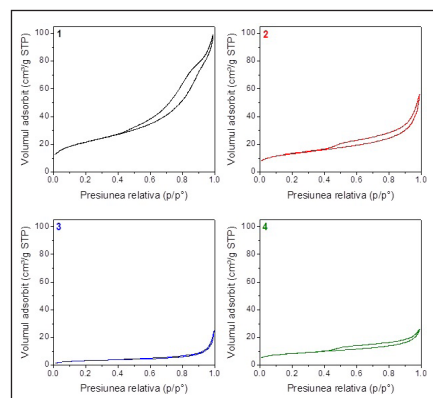
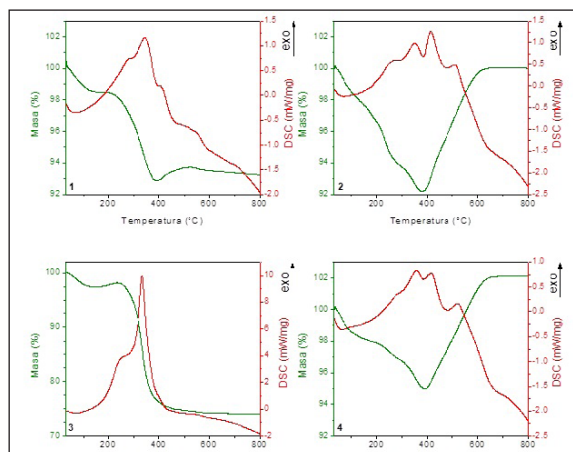
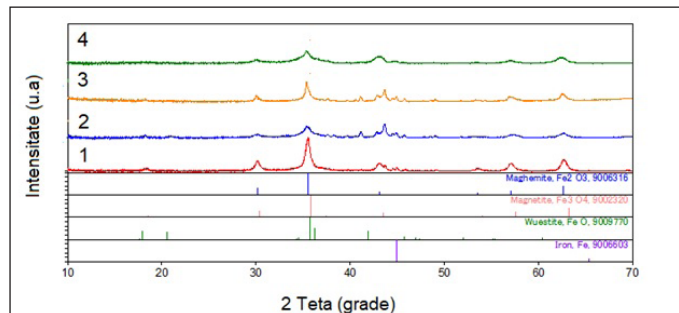
PROCESS FOR OBTAINING IRON OXIDE POWDER, GAMMA- $\text{Fe}_2\text{O}_3/\text{Fe}_3\text{O}_4$ WITH ADJUSTABLE PROPERTIES



- The invention relates to a new method for obtaining $\gamma\text{-Fe}_2\text{O}_3$ (maghemite) and Fe_3O_4 (magnetite) iron oxide powders, with adjustable properties.

- The technical problem solved by the invention consists in establishing a process for obtaining iron oxide nanoparticles, $\gamma\text{-Fe}_2\text{O}_3/\text{Fe}_3\text{O}_4$, with properties: superparamagnetism, saturation magnetization, crystallite size, specific surface area, pore volume that can be controlled and adjusted by the synthesis parameters.

- The proposed process uses a homogeneous mixture of ferric nitrate and ethylenediaminetetraacetic acid subjected to a combustion process initiated at 400°C , resulting in iron oxide nanoparticles with properties (superparamagnetism, saturation magnetization, crystallite size, specific surface area, pore volume) that can be easily adjusted by appropriately choosing the molar ratio between ferric nitrate and ethylenediaminetetraacetic acid, by the method of initiating the combustion reaction, on an electric nest or in a microwave oven, respectively by the time the sample is kept in the electric nest or in the microwave oven.



INVENTORS: LUPA LAVINIA, NEGREA PETRU, COCHECI LAURA, FILIMON ANCA

PATENT NO. RO 135873 B1/ 2025

TESTING SYSTEM OF FUNCTIONALIZED MEMBRANES FOR WATER TREATMENT



- The invention relates to a system for testing the efficiency of polymeric membranes used in the treatment of various aqueous solutions, with a conventional or specialized structure (porous or composite), with a filtration area between 0.2 and 9.6 cm², available on the market or obtained under laboratory conditions and functionalized for various pollutants.

- The testing system for functionalized membranes in water treatment includes a storage vessel (1) for the aqueous solution, a peristaltic pump (2) with adjustable speed to feed the solution into a pressure-resistant vessel (4) via a membrane support device (3).

- Filtration occurs due to a vacuum created by pump (5), with pressure regulated by gauge (5.1) attached to vessel (4), which is sealed with a stainless steel lid (6).

- The vacuum pump (5) connects to vessel (4) through lid (6) and to device (3) via openings (a) and (b). Vessel (4) features a fixed base plate (7) and a movable plate (8) for sample collection containers (9), both made of Teflon.

- The movable plate (8), which can rotate using shaft (10) through the sealed opening (c) in lid (6). It operates via indexing lever (11) and is positioned by stop (12) between plates (7) and (8). This design allows for simultaneous sample collection without interrupting filtration, reducing testing time and costs.

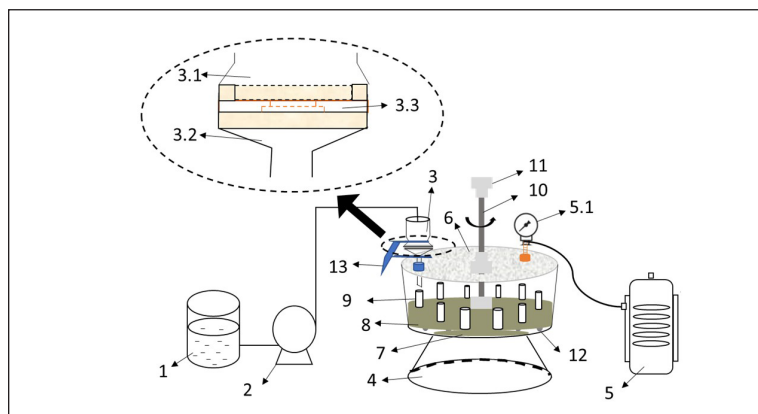


Fig.1. Overview of the filtration system

- The membrane support device (3) consists of two glass chambers ($\varnothing = 4$ cm) with glass frits, securing the membrane.
- The aqueous solution enters compartment (3.1), filters through the membrane, and permeate collects in compartment (3.2).
- To lower membrane production costs and reagent use, supports (3.3) for smaller membranes (0.5 to 3.5 cm) are proposed, as shown in Figure 5.
- These Teflon supports feature a 1 mm recess for proper membrane placement.

- The testing system for functionalized membranes in water treatment, as described in the invention, offers several advantages:

- The permeate is filtered through the membrane via vacuum rather than pressure, enabling both filtration studies based on pollutant size and the evaluation of functionalized membranes for water purification through interactions between functional groups and various pollutants.
- The permeate is drawn from a sealed container with collection vessels positioned beneath the membrane, allowing for time-dependent performance testing under consistent operating conditions. This setup also facilitates the assessment of membranes for treating wastewater containing volatile organic compounds or solvents, minimizing atmospheric release and enabling solvent recovery.

HONORARY MEMBERS

DOCTOR HONORIS CAUSA

Professor Nicolae-Adrian LEMENI, Faculty of Orthodox Theology, University of Bucharest



- The Politehnica University Timișoara honors its tradition of academic excellence by awarding the title of Doctor Honoris Causa to **Professor Nicolae-Adrian LEMENI**, a prominent personality of contemporary Orthodox theology, recognized for his contributions in the dialogue between theology, science and culture.

- **Professor LEMENI** is an associate professor at the Faculty of Orthodox Theology of the University of Bucharest, where he teaches Dogmatic Theology and Fundamental Theology, and he coordinates large-scale academic activities as Director of the Center for Dialogue and Research in Theology, Philosophy and Science and Director of the "Dimitrie Stăniloae" Doctoral School.

- Laudatio, presented by Prof.dr. Sorin MUȘUROI, highlighted the role of **Professor LEMENI** as a prolific author and promoter of interdisciplinary dialogue, while Acad. Mircea DUMITRU underlined the long collaboration and the joint contribution to dialogue initiatives between science, philosophy and religion.

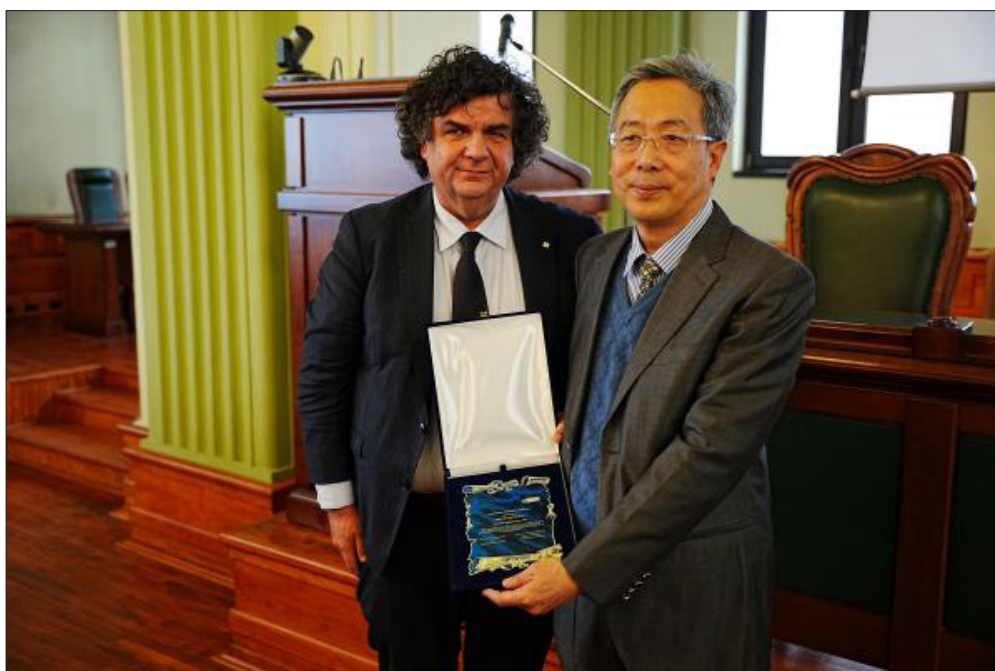
- After receiving the title, **Professor Nicolae-Adrian LEMENI** defended the dissertation "**Truth – Theme and Stake of Thought**", analyzing the philosophical and theological implications of Kurt Gödel's incompleteness theorems and the relationship between scientific knowledge, philosophical reflection and the spiritual experience of truth.

- The title was conferred on him during the festive meeting held on **November 5, 2025**, in the UPT Senate Hall, where Assoc.Prof.Math. dr. Liviu Cădariu-Brăiloiu underlined the prestige of the laureate and the honor of his return to the academic community.

- The UPT Rector, Assoc.Prof.dr. Florin Drăgan noted that the event is part of the series of events dedicated to the 105th anniversary of UPT, and highlighted the unity between truth, knowledge and service, all reflected in the work of **Professor LEMENI**.

HONORARY PROFESSOR

Prof. Dr. Qingyan MENG, title awarded on December 3rd, 2025



- On December 3rd, 2025, the Politehnica University Timisoara conferred the title of **Honorary Professor** to the famous remote-sensing researcher **Prof. Dr. Qingyan Meng**, an internationally renowned specialist in aerospace information, remote sensing and urban research, affiliated with the Aerospace Information Research Institute (AIRI) of the Chinese Academy of Sciences (CAS).

- **Professor Meng** is recognized for essential contributions in the development of urban remote sensing, monitoring of green spaces, heat islands and urban climate parameters, as well as in the analysis of satellite images. His impressive portfolio includes more than 160 articles, monographs, patents and international distinctions, reflecting globally significant scientific impact.

- The collaboration between UPT and AIRI/CAS, developed over the last decade, has generated bilateral projects, joint publications and access to advanced research infrastructures, including Chinese

satellite programs dedicated to Earth observation. These resources have strengthened UPT's capacity to conduct competitive research in remote sensing, urban analytics and environmental monitoring.

- The Laudatio was delivered by Prof. Dr. Sorin Herban, vice-dean of the Faculty of Civil Engineering and close collaborator of Professor Meng, who highlighted his outstanding academic career, his leadership roles in key institutes of the Chinese Academy of Sciences and his major contributions in the field of urban remote sensing. Professor Meng's work has been internationally recognized through numerous awards, including the Hsue-Shen Tsien Gold Medal, awarded for his research on urban green spaces.

- In his speech, **Prof. Dr. Qingyan Meng** thanked UPT for awarding the title and underlined the solidity of the collaboration with Prof. Sorin Herban and the research teams from the Faculty of Civil Engineering.

- He presented the structure and role of the Aerospace Information Research Institute within CAS, as well as the recent results of his research dedicated to the urban environment and green spaces, highlighting the contribution of aerospace analysis to the sustainable management of cities.

- The award of the title of Honorary Professor strengthens UPT's international visibility and strengthens the university's strategic relations with one of the most important research centers in remote sensing globally.

HABILITATION THESIS

ANALYSIS AND OPTIMIZATION OF THERMOGASODYNAMIC PROCESSES: FROM HEAT TRANSFER IN FLAME FURNACES TO PERFORMANCE AND SUSTAINABILITY IN THE AUTOMOTIVE SECTOR

Author: Sorin-Aurel RAȚIU

Abstract

- Field of qualification to supervise doctoral theses – Mechanical Engineering; The habilitation thesis entitled **“Analysis and Optimization of Thermogasodynamic Processes: From Heat Transfer in Flame Furnaces to Performance and Sustainability in the Automotive Sector”** synthesizes the author’s scientific, teaching, and research activity developed primarily within the Faculty of Engineering in Hunedoara, Politehnica University Timișoara.
- The work adopts a multidisciplinary approach, integrating mechanical and automotive engineering, heat transfer, thermogasodynamic optimization, and sustainability in the automotive industry. The research is structured around **three major directions**. **The first** focuses on heat transfer phenomena in industrial flame furnaces used for heating steel semi-finished products. Analytical and numerical models based on finite difference and finite element methods were developed to simulate thermal fields and optimize heating processes. • These models were validated through laboratory experiments and industrial collaborations with metallurgical companies, demonstrating their applicability under real operating conditions. The results highlight significant potential for improving energy efficiency and reducing pollutant emissions through optimized furnace operation.
- **The second research direction** addresses thermogasodynamic processes in internal combustion engines, with emphasis on improving performance and reducing emissions. Studies were conducted on heat transfer in engine compartments, intake air thermal insulation, and the influence of intake manifold materials on air density and volumetric efficiency. The optimization of the compression process through a variable compression ratio mechanism was investigated using numerical simulations, revealing efficiency gains particularly at low and medium engine loads.
- Additionally, the impact of exhaust gas recirculation (EGR) systems on combustion quality and emissions in diesel engines was analyzed. This research benefited from international collaborations and was closely integrated into teaching activities by involving students in simulations and experimental work. • **The third research direction** is dedicated to technical innovation and sustainability in the automotive sector. It includes patented solutions for mechanical transmissions, notably a self-adaptive mechanical reducer with a variable transmission ratio designed to improve efficiency in electric vehicles.



Complementary studies explored sustainable materials and processes, such as bioplastics, “Green Carbon” derived from algae, and innovative methods for recycling and valorizing used motor oils.

- These contributions support the transition toward environmentally responsible technologies and circular economy principles in the automotive industry.
- The thesis follows CNADTCU requirements and is structured into two main parts. The first presents the scientific, professional, and academic achievements, while the second outlines future perspectives for career development and research.
- Overall, the work demonstrates original contributions through validated models, patented innovations, and sustainable solutions, while also emphasizing the integration of research outcomes into engineering education and industry practice.

The full abstract at:

https://arhiva.upt.ro/img/files/2023-2024/doctorat/abilitare/Ratiu_Sorin%20Aurel/Ratiu_Sorin_Rezumatul_tezei_de_abilitare.pdf

Habilitation Commission

- Prof. Dr. Eng. Ilare BORDEAȘU – Politehnica University Timișoara, Chair
- Prof. Dr. Eng. Anton HADĂR – National University of Science and Technology Politehnica Bucharest, Member
- Prof. Dr. Eng. Ioan Călin ROȘCA – Transilvania University of Brașov, Member

INNOVATIVE TECHNIQUES FOR WELDING PROCESS UTILIZATION AND CONTROL



Author: Anamaria Ioana FEIER

Abstract

- The habilitation thesis entitled **"Innovative techniques for welding process utilization control"** summarises the scientific and academic work carried out by the author in the field of industrial engineering between 2013 and 2024, following the defence of her doctoral thesis on the rehabilitation of historic Gerber metal bridges.
- The thesis is structured in three main parts: a presentation of scientific and professional achievements, an overview of the research directions developed by the author, and a professional development strategy for the coming period.
- **The first section of the thesis** presents the major achievements of the last 11 years. These achievements are divided into four main areas:
 - steel structures,
 - welding methods and dissimilar joints,
 - stress and strain control,
 - occupational health and safety.
- These are complemented by significant contributions in ergonomics, VR, and quality management. The author's research has been sustained by a remarkable collection of scientific articles, 124 articles, 9 books, and 4 book chapters, as well as over 20 research projects in which the author was a member or director.
- Professional prestige is consolidated through relevant publications (34 articles in Web of Science, including 16 in journals, including Q1), participation in professional organizations, and reviewing activities. Scientometric indices include an H-index of 4 in Web of Science and Scopus, and 8 in Google Scholar.
- **The second part of the thesis** presents the research results. The researcher conducted comprehensive analyses of fracture mechanics in the field of Metal Structures.

- These analyses showed that minor defects, such as cracks of approximately 2 mm, can significantly reduce the service life of essential components in Gerber structures.
- At the same time, efforts were made to optimize laboratory tests that examine the behavior of steel at low temperatures. The implementation of the WAAM process and the achievement of a dissimilar joint by friction/riveting were examples pioneered in the department to which the author belongs.

- These have resulted over 15 publications, some of them published in journals in the first quarter.
- The direction regarding the control of stresses and strains has led to the introduction of a new university discipline and to over 10 articles and a book published in 2024.
- In the **field of OSH**, the author has published more than 10 studies, including one in a Q1 journal, contributing to the development of preventive measures for high-risk workplaces.
- The intention to attract internationally recognized specialists for collaboration in education and research is mentioned in the last section of the thesis.

The full abstract at:

http://arhiva.upt.ro/img/files/2024-2025/doctordat/abilitare/Feier_Anamaria/Teza_abilitare_FeierA.pdf

Habilitation Commission

- Prof. Dr. Eng. Dumitru ȚUCU - Politehnica University Timișoara, Chair
- Prof. Dr. Eng. Petru BERCE- Technical University of Cluj-Napoca, Member
- Prof. Dr. Eng. Sever-Gabriel RACZ - Lucian Blaga University of Sibiu, Member
- Prof. Dr. Eng. Roland- Iosif MORARU - University of Petroșani, Supplementary Member
- Prof. Dr. Eng. Aurel TULCAN - Politehnica University Timișoara, Supplementary Member

CONTRIBUTIONS IN THE DESIGN AND RESEARCH OF AIR-HYDRO-MECHANIC EQUIPMENT OF ACTUATION AND FORCE



Author: Daniel Cătălin STROIȚĂ

Abstract

• The thesis is structured into three chapters, reflecting the professional evolution, research contributions, and future academic development directions:

- **Chapter I. Retrospective of professional achievements from the moment of obtaining the Phd. degree until present** presents the main professional and academic achievements following the completion of the PhD thesis “**Dynamic Identification of Double Flux Turbines**” (2009).

The activity includes:

- **Assistant at the Department of Hydraulic Machines** (2009–2012);
- **Design engineer** in marine drilling pipe handling systems at National Oilwell Varco, Norway (2012–2017), with significant experience gained in advanced electro hydraulic servomechanisms;
- and, starting from 2017, **academic activity** within the **Faculty of Mechanics**, where two hydraulic and pneumatic drive stands were commissioned and new laboratory materials were developed.
- The author has published **four specialized books** and **two laboratory guides**, and has contributed to **16 national and international research projects**. His scientific output includes **39 papers**, among which 12 ISI-indexed (5 with impact factor), 4 BDI articles, and 23 papers in national and international journals.
- **Chapters II “The results of the research activity in the field of dynamic identification of wind turbine drive systems”** details the research conducted in the field of **hydraulic drives** and more concretely **on a hydraulic system that adjusts the blades of a**

wind turbine. This chapter presents the experimental setup, measuring equipment, and identification methodologies employed to determine transfer functions and frequency characteristics based on various criteria in the field of **Automation**.

Chapter III. Professional and academic career development plan outlines a development plan aligned with the current academic and industrial context, focusing on modernizing the taught disciplines, strengthening the training of future PhD students, and integrating students at all levels in research activities related to **Hydrodynamics and Hydraulic drive systems**.

The full abstract at:

https://arhiva.upt.ro/img/files/2024-2025/doctorat/abilitare/Stroita_Catalin/Rezumat_StroitaCD.pdf

Habilitation Commission

- **Prof. Dr. Eng. Anton HADĂR**, National University of Science and Technology Politehnica Bucharest, **Chair**
- **Prof. Dr. Eng. Ioan Călin ROȘCA**, Transilvania University of Brașov, **Member**
- **Prof. Dr. Eng. Ilare BORDEAȘU**, Politehnica University Timișoara, **Member**

DC-DC CONVERTERS – ARCHITECTURES, CONTROL AND APPLICATIONS



Author : Ioana-Monica POP-CĂLIMANU

Abstract

• The habilitation field in which the author will act as PhD advisor is "Electronics, Telecommunications and Information Technologies".

The habilitation thesis (HT) entitled **"DC-DC Converters – Architectures, Control and Applications,"** presents the scientific, academic, and professional contributions of the author in the field of power electronics, focusing on the development, control, and applications of power converters. The research activities were carried out after the PhD defense in 2015.

• The HT begins with an overview of the new topologies proposed in the PhD thesis that include bidirectional and hybrid converters. Attention is given to switching cell structures and the use of L- and C-switching configurations for achieving efficient power conversion.

• A comparative analysis of the original topologies with the already reported in the literature ones, highlights the latter limitations with respects to efficiency, voltage conversion ratio, component count and stresses motivating the development of novel hybrid converter families.

• The main scientific contributions are organized into four major research directions.

• **The first** concerns the development of innovative converter topologies, such as Buck-L, Boost-L, Buck-Boost-L, and Ćuk-L converters. These architectures integrate coupled inductors, interleaved switching techniques, and advanced control methods to improve efficiency, reduce stress on components, and enhance voltage regulation.

The proposed converters are validated through mathematical modelling, simulations, and experimental prototypes.

• **The second research direction** addresses advanced control methods for DC-DC converters, focusing on stability analysis, bifurcation phenomena, and controller design. Improved control strategies for high-order converters are proposed, ensuring enhanced transient response, reduced output voltage ripples, and increased robustness under varying operating conditions.

• **The third area** focuses on renewable energy applications, particularly photovoltaic and fuel cell systems. Novel high step-up converters and coupled-inductor SEPIC-based topologies are developed to improve energy harvesting efficiency and reduce power losses. Experimental results confirm their suitability for renewable energy integration.

• **The fourth research direction**, which was also a part of a grant, extends the proposed solutions to battery-fuel cell hybrid vehicles, introducing efficient power management strategies and multiphase converter architectures for optimized energy distribution and regenerative braking.

• The thesis also highlights the author's contributions to international scientific community dissemination, research projects, student guidance, and extra academic activities.

The full abstract at:

https://arhiva.upt.ro/img/files/2024-2025/doctorat/abilitare/Pop-C%4%83limanu/Rezumat_teza_de_abilitare_Pop_Calimanu_En.pdf

Habilitation Commission

• **Prof. Dr. Eng. Daniela TĂRNICERIU**, Gheorghe Asachi Technical University of Iași, **Chair**

• **Prof. Dr. Eng. Dorin Marius PETREUȘ**, Technical University of Cluj-Napoca, **Member**

• **Prof. Dr. Eng. Cosmin ANCUȚI**, Politehnica University Timișoara, **Member**

PhD THESIS

Systems Engineering

Iuliu Alexandru ZAMFIRACHE
PhD adviser prof. R.E. PRECUP

Abordări hibride de reglare care integrează tehnici de învățare prin recompensă și algoritmi inspirați din natură RO
(Hybrid Control Approaches Integrating Reinforcement Learning Techniques and Nature-Inspired Algorithms)

Computers and Information Technology

Adrian-Eugen MUȘUROI
PhD adviser prof. B. GROZA

Schimb de Cheie și Sincronizare Temporală Securizate pentru Magistrala Controller Area Network
(Secure Key Exchange and Time Synchronization for Controller Area Networks)

Marian-Emanuel IONAȘCU
PhD adviser prof. M.G. MARCU

Îmbunătățirea tehnicilor de calibrare și calitatea datelor pentru monitorizarea aerului din spațiul personal folosind o platformă de dispozitive fixe și mobile
(Improvement of Calibration Techniques and Data Quality for Personal Space Air Monitoring using a Platform of Fixed and Mobile Low-Cost Devices)

Chemical Engineering

Ioan-Alexandru UDREA
PhD adviser prof. N. VASZILCSIN

Obținerea unor esteri utilizabili în industria alimentară și în parfumerie prin sinteză în câmp electromagnetic
(Synthesis of esters for food and perfumery industries using an electromagnetic field)

Mihaela-Alexandra LĂBOȘEL
PhD adviser prof. N. VASZILCSIN

Oxidarea anodică a sulfiților în mediu neutru și alcalin pe materiale nenobile
(Anodic oxidation of sulfites in neutral and alkaline medium on non-noble materials)

Civil Engineering and Building Services

Anna PRODAN

PhD adviser prof. A. STRATAN

Comportarea seismică a linkurilor din oțel inoxidabil și a celor hibride, pentru cadre contravântuite excentric

(Seismic response of stainless steel and hybrid links for eccentrically braced frames)

Francesco PLAITANO

PhD adviser prof. A. STRATAN

PhD adviser prof. E. NASTRI

Efectul dalei de beton și al îmbinării asupra performanței link-urilor bulonate în cadre contravântuite excentric cu autorecentrare

(Effect of concrete slab and connection on performance of bolted links in re-centring eccentrically braced frames)

Adelin-Emanuel ȘTIRB

PhD adviser prof. A.L. CIUTINA

Studiul structurilor rutiere cu strat de uzură realizat din mixturi asfaltice cu adaos de polimer

(Study of road structures with wearing course made of asphalt mixtures with polymer addition)

Nicoleta-Elena SUCIU (married KABA)

PhD adviser prof. A. RETEZAN

Energii neconvenționale și protecția mediului, obiective ale instalațiilor pentru construcții

(Unconventional energies and environmental protection, objectives of building services)

Dănuț Marcel TOKAR

PhD adviser prof. I. SÂRBU

Optimizarea funcțional-energetică a sistemelor pentru conversia și stocarea a noi energii regenerabile

(Operational-energy optimisation of systems for the conversion and storage of new renewable energies)

Ovidiu Ștefan CUZIC

PhD adviser prof. T.E. MAN

Scanarea Laser 3D, tehnologie modernă pentru eficientizarea soluțiilor de reabilitare a diferitelor tipuri de construcții

(3D Laser Scanning: A Modern Technology for Optimizing Rehabilitation Solutions for Various Types of Constructions)

Dragoș Petru BOCAN

PhD adviser prof. A.L. CIUTINA

Consolidarea clădirilor istorice din zidărie cu materiale compozite armate cu țesături

(Structural strengthening of historic masonry buildings using mesh reinforced composite materials)

Loredana COPĂCEAN

PhD adviser prof. E.T. MAN

Metode avansate bazate pe GIS și teledetecție pentru evaluarea și estimarea susceptibilității la inundații și eroziune. Studii de caz: bazinul hidrografic Crișul Alb

(Advanced methods based on GIS and remote sensing for the evaluation and estimation of flood and erosion susceptibility in hydrotechnical and land improvement arrangements. Case studies: Crișul Alb river basin)

Electrical Engineering

Liviu-Dănuț VITAN
PhD adviser prof. N. MUNTEAN

Modelarea, controlul și testarea mașinilor electrice cu magneți permanenți și reluctanță variabilă pentru aplicații în energii regenerabile și automotive
(Modeling, control, and testing of AC PM and reluctance electric machines for renewable energies and automotive applications)

Electronic Engineering Telecommunications and Information Technologies

Radu RICMAN
PhD adviser prof. A. GONTEAN

Contribuții la modelarea și simularea electrică și termică a serelor care utilizează PV transparente. Validare Experimentală.
(Contributions to the Electrical and Thermal Modeling and Simulation of Greenhouses Using Transparent PV. Experimental Validation.)

Teodor-Octavian PĂCURAR
PhD adviser prof. A. DE SABATA

Măsurile ale ocupării spectrale în diferite game de frecvențe
(Spectrum occupancy measurements in different frequency bands)

Evelyn-Astrid LOVASZ
(married LOVASZ-DRAGOȚEL)
PhD adviser prof. D.F. LASCU

Arhitecturi, tehnici de modelare și metode de comandă pentru convertitoare DC-DC în comutație
(Architectures, modeling techniques and control methods for DC-DC switching converters)

Power Engineering

Florian Iulian CRIȘOVAN
PhD adviser prof. F.M. FRIGURĂ-ILIASA

Contribuții privind îmbunătățirea integrării în SEN a centralelor fotovoltaice
(Contribution regarding the integration of photovoltaic power plants into the grid)

Engineering and Management

Ioan-Mihai COSTA
PhD adviser prof. M. TĂMĂȘILĂ

Cercetări privind managementul îmbunătățirii continue a serviciilor universitare suport
(Research on the management of continuous improvement of university support services)

Constantin Florin BOGDEA
PhD adviser prof. V.L. IVAȘCU

Managementul și implementarea sistemelor informatice la operatorii edilitari pentru un concept SMART CITY
(The management and implementation of information systems at municipal operators for a SMART CITY concept)

Gabriela PICA (married BĂNĂDUC)
PhD adviser prof. A. DRĂGHICI

Cercetări privind ingineria și managementul proiectelor de dezvoltare urbană sustenabilă
(Research on engineering and management of sustainable urban development projects)

Marta PALADE
PhD adviser prof. A. DRĂGHICI

Modele de inteligență artificială pentru sisteme decizionale
(Artificial Intelligence Models for Decision-Making Systems)

Michael PETRI
PhD adviser prof. M.L. MOCAN

Spre Depozitarea Inteligentă: Integrarea Instrumentelor Lean și Industriei 4.0 pentru Îmbunătățirea Performanței Logisticii din Industria Automotive
(Towards intelligent warehousing: integrating lean and industry 4.0 tools to enhance automotive logistics performance)

Nicoleta MIREA
PhD adviser prof. A. DRĂGHICI

Inovarea și transferul tehnologic, mijloace pentru eficientizarea educației în știință, tehnologie, inginerie și matematică
(Innovation and technology transfer, means to make education in science, technology, engineering and mathematics more efficient)

Darius BARMAYOUN
PhD adviser prof. M.L. MOCAN

Asigurarea conformității cu standardele de securitate cibernetică prin integrarea mai multor standarde în contextul proiectelor de dezvoltare software în industria auto
(Ensuring cybersecurity standards compliance by integration of multiple standards in the context of automotive software development projects)

Mechanical Engineering

Remus Ștefan MĂRUȚĂ PhD adviser prof. L. MARȘAVINA	<i>Evaluarea rezistenței la oboseală a componentelor din aliaj de aluminiu folosite în domeniul automotive</i> (Evaluation of the fatigue resistance of aluminum alloy components used in the automotive field)
Ștefan IZVOREAN PhD adviser prof. D. LELEA	<i>Studiul injecției de alcool și alcool diluat cu apă în admisia unui motor cu aprindere prin comprimare</i> (Study of alcohol and water diluted alcohol injection in the intake of a compression ignition engine)
Călin Daniel ȘTEFAN PhD adviser prof. L. MARȘAVINA	<i>Impactul inițierii precoce a programului de recuperare asupra biomecanicii, staticii și mersului după artroplastia totală de șold</i> (The impact of early initiation of the rehabilitation program on biomechanics, statics, and gait after total hip arthroplasty)
Andreea NICOARĂ (married STOIA) PhD adviser prof. N. HERIȘANU	<i>Studiul analitic al dinamicii membrului inferior uman în timpul mersului</i> (Analytical study of human lower limb dynamics in gait)
Cristina Mihaela DRĂGAN PhD adviser prof. D. LELEA	<i>Optimizarea dispozitivelor electronice de tip ECU utilizate în industria automotive</i> (Thermal design optimization for automotive ECUs)

Materials Engineering

Sebastian AMBRUȘ PhD adviser prof. V.A. ȘERBAN	<i>Obținerea, caracterizarea aliajelor metalice amorphe pe bază de Cu-Ni-Sn-P-(Ga) și dezvoltarea aplicațiilor acestora utilizând procedee specifice fabricației aditive hibride</i> (Synthesis, Characterization of Cu-Ni-Sn-P-(Ga) Based Amorphous Alloys, and the Development of Their Applications Using Specific Hybrid Additive Manufacturing Processes)
Julian Günter EBLER PhD adviser prof. I.D. UȚU	<i>Influența adaosului de hBN asupra proprietăților straturilor cermet pe bază de Cr_3C_2-NiCr</i> (Influence of added hBN on the properties of cermet coatings based on Cr_3C_2 -NiCr)
Paul Daniel MUTASCU PhD adviser prof. I. MITELEA PhD adviser prof. I. BORDEAȘU	<i>Microstructura și rezistența la eroziune prin cavitație a unor straturi depuse prin sudare pe oțeluri inoxidabile Duplex</i> (Microstructure and cavitation erosion resistance of weld-deposited layers on Duplex stainless steels)
Daniela COSMA (married ALEXA) PhD adviser prof. I. MITELEA	<i>Microstructura și rezistența la eroziune prin cavitație a unor oțeluri înalte aliate, turnate în piese</i> (Microstructure and cavitation erosion resistance of some high alloyed steels, cast in parts)

Industrial Engineering

Adrian Ciprian FIRU
PhD adviser prof. G.E. DRĂGHICI

Dezvoltarea produsului pentru serii reduse de fabricație în industria de autovehicule, în contextul industriei 4.0

(Product development for small-volume manufacturing in the automotive industry, in the context of industry 4.0)

INTERNATIONAL SCIENTIFIC CONFERENCES



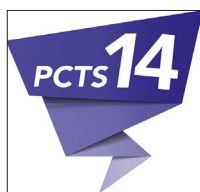
International Workshop Open Education & Science Practices 2025

13 March 2025, Room K1, Conference Center of Politehnica University Timișoara and online

Organizer(s): Department of ID/IFR and Digital Education UPT, together with the Alliance of European Universities E³UDRES² and the HE project Ent-re-novators, with the support of IEEE Romania, within the Open Education Week 2025

Web: <https://elearning.upt.ro/en/evenimente/peste-500-de-participanti-la-workshop-open-education-science-practices-2025-upt/#>

- The hybrid event gathered over 500 participants, 466 online and 50 participants on-site, in the K1 Amphitheater of the UPT Conference Center. Sessions explored the impact of AI, VR, and blockchain on education and research, providing practical examples and case studies.
- Under the theme "**Challenges in Practices, Tools, and Methods of Open Science and Open Education**", the workshop explored how open science and open educational resources (OER) are integrated into university practices, research projects, and general education. A particular emphasis was placed on the response of educational and research systems to the challenges posed by emerging technologies, such as artificial intelligence (AI), virtual reality (VR), and blockchain. The event gathered 15 speakers from Romania, Germany, Austria, Sweden, Belgium, and the USA, opening with Keynote speaker Anthony Camilleri (Knowledge Innovation Center – KIC), for the first time in Timișoara.
- The collaborative spirit was significantly amplified by the participation of esteemed experts from five distinct university alliances (E³UDRES, UNITE, UNITA, EU4DUAL, CLUSTER). This strategic presence facilitated a profound interconnection, nurturing the growth of robust collaborative networks and fostering exchange of knowledge and best practices across the open education, open science practices.
- Participants were given the opportunity to evaluate the event, and the feedback provided was overwhelmingly positive, as well as the many direct positive messages.
- **Publication of papers:**
Publishing House of the Politehnica University Timișoara



Professional Communication and Translation Studies: Digital Culture, Communication and Translation

03-04 April 2025, On-site and virtual conference,
Timișoara, Romania

Organizer(s): Department of Communication and Foreign Languages, Politehnica University Timișoara

Web: <https://sc.upt.ro/ro/home-pcts>

The international conference **Professional Communication and Translation Studies (PCTS)** has been organized by the Department of Communication and Foreign Languages since 2001.

The conference focuses traditionally on the following topics:

- Communication and public relations: theoretical and didactic problems and solutions;
- Linguistic insights into professional communication;
- Translation theory and translation didactics: their roles in communication;
- Foreign language teaching.

Given the success of the previous conferences, the 14th edition of the conference aimed to continue the exchange of ideas on the impact of new technologies on communication, to highlight the evolution of humanities and social sciences in conjunction with technological innovation, and to identify (new) trends in the language industry in the post web 2.0 era.

• Publication of papers:

Selected papers published in the volume **Professional Communication and Translation Studies**

(peer-reviewed, indexed by EBSCO, Index Copernicus, CEEOL, Fabula, Google Scholar, WorldCat) or in the **Scientific Bulletin of Politehnica University Timișoara, Transactions on Modern Languages** (peer-reviewed, indexed by CEEOL, EBSCO, ERIHPLUS, Europeana, Google Scholar, MLA, ULRICH'S and WorldCat).

The languages of publication are English, French or German.



Building Services and Environmental Comfort – ICCA 2025

May 8-9, 2025, UPT Library – Auditorium, K1 and K2, Bv. Vasile Pârvan 2, Timișoara 30022 (Participation physical and online, through the ZOOM application)

Organizers: AIIR – Romanian Association of Building Services; Politehnica University Timisoara – Department of Civil Engineering and Building Services Engineering

Web: <https://www.aiiro.ro/evenimente/conferinte/-606.html>

- The **Conference Building Services and Ambiental Comfort (BSAC)**, now in its 34th edition, offered specialists from research, execution, maintenance and education, concerned with ensuring healthy Ambiental Comfort in the buildings.
- The „closest” example of change in the universe is **climate change**. For human’s evolutionary tendencies manifest themselves in science and technology.
- The field of construction, in which building services have a special role, being responsible for ensuring environmental comfort responds

to the challenges and opportunities offered by "life" by increasing the quality of life; respecting and integrating nature into everyday life; sustainability of work; energy efficiency; ergonomics; flexibility; reducing pollution.

– The topics addressed provided a starting/continuing basis depending on the specific areas of interest of the participants. The conclusions were in favor of efficiency, safety, and security, ensuring by using of high-performance materials, the optimization of all types of installations and equipment.

Publication of papers:

– Conference Proceedings, Publishing House Matrix Rom, Bucharest, 2025, ISSN 1842-9491

Conference series "**Building Services and Environmental Comfort**"

**C2I/CIE
2025**

The 4th International Conference on Integrated Engineering – CIE/C2I 2025

5-6 May 2025, Politehnica University Timișoara, Conference Centre & Faculty of Mechanical Engineering, Hybrid format (on-site and online)

Organizers:

• Department of Materials and Manufacturing Engineering, Faculty of Mechanical Engineering, Politehnica University Timișoara, with the support of the Manufacturing Engineering University Association (AUIF)

Web: <https://c2i.upt.ro/>

- The conference aimed to bring together academic scientists, researchers, and Ph.D. students to exchange and share their experiences and research results on all aspects of Manufacturing Engineering and Industrial Engineering.
- The main subject of the conference was focused on Manufacturing in **Industry 4.0** toward **5.0**, with the following topics:

- Integrated Product Development; • Virtual Design and manufacturing
- Digital Manufacturing; • Additive Manufacturing;
- Manufacturing processes; • Technologies for Industry 4.0 / 5.0
- Flexible and Smart Manufacturing Systems; • Intelligent Measuring and Control;
- Production Planning and Control; • Production Management

Publication of papers:

• All papers presented at the conference were published in a special issue of the Journal **Acta Technica Napocensis** (Series: APPLIED MATHEMATICS, MECHANICS AND ENGINEERING), indexed by ISI Thomson/Clarivate Analytics.

<https://atna-mam.utcluj.ro/index.php/Acta>

SACI 2025

IEEE 19th International Symposium on Applied Computational Intelligence and Informatics (SACI 2025)

May 19 – 24, 2025, Budapest, Hungary and Timisoara, Romania

Organizers: • Óbuda University, Budapest, Hungary,
• Politehnica University Timisoara,
• IEEE Chapter of Systems, Man, and Cybernetics Society, Romania
• Web: <https://conf.uni-obuda.hu/saci2025/>

SACI 2025 has featured several kinds of presentations, including invited talks, contributed papers and posters.

The outcome of SACI 2025 is a better understanding of some leading research areas, as already Computational Intelligence and Informatics have demonstrated.

SACI 2025 has welcomed papers on the following topics:

- Computational Intelligence,
- Intelligent Mechatronics,
- Systems Engineering,
- Intelligent Manufacturing Systems,
- Intelligent Control,
- Intelligent Robotics,
- Informatics.

Publication of papers:

- IEEE Xplore Digital Library, please visit:

<https://ieeexplore.ieee.org/xpl/conhome/11030063/proceeding>

The papers are also indexed in Clarivate Analytics Web of Science, Scopus, and DBLP.



ICAS 2025 – The 13th International Conference on Applied Sciences

29 – 31 May 2025, Faculty of Engineering Hunedoara, Romania, onsite & online

Organizers: • Politehnica University Timișoara, Faculty of Engineering Hunedoara, and • University Vitez, Faculty of Information Technology in cooperation with: • Academy of Romanian Scientists; General Association of Romanian Engineers – Hunedoara Branch; • Association Universitaria Hunedoara; Bosnia and Herzegovina American Academy of Arts and Science; • Western Balkan Alumni Association

• Web: <https://icas.fih.upt.ro/>

• The 13th edition, ICAS 2025, including invited talks, contributed papers and posters, was held in Hunedoara, Romania, in hybrid format, covering a broad spectrum of topics in applied sciences, engineering and technology. Plenary contributions addressed immersive reality technologies in modern manufacturing as part of the transition towards **Industry 5.0**, as well as developments in artificial intelligence and machine learning.

• The contributed papers span the fields of **Mechanical Engineering, Materials Engineering, Fundamental Sciences, Computers Engineering and Electrical Engineering**, reflecting current advances in energy efficiency, simulation-driven design, sustainable materials and digital transformation.

• The conference brought together participants from more than forty-five universities, research centers and companies representing the United States, China, Iraq, Turkey, Greece, Bosnia and Herzegovina, Serbia, Montenegro, Slovakia, Austria, Poland, Ukraine, Estonia and Romania. ICAS continues to strengthen scientific collaboration and to foster links among the Balkan region, the European Union and the wider international research community.

Publication of papers:

• Proceedings of ICAS 2025 was published open access as a volume in **IOP SCIENCE – JOURNAL OF PHYSICS: CONFERENCE SERIES**, Vol. 3153, Issue 1, ISSN: 1742-6588, e-ISSN: 1742-6596, <https://iopscience.iop.org/issue/1742-6596/3153/1>

The volume is indexed in Scopus.

Book of Abstracts, ISSN 3100-4164, Editor: Daniela Delia Alic, published online by Editura Politehnica Timisoara, is available in full text at:

<https://icas.fih.upt.ro/wp-content/uploads/2025/10/ICAS2025-Book-of-Abstracts.pdf>



ICMA – 2025, the 16th International Conference on Mathematics and its Applications

29–31 May 2025, Faculty of Mechanical Engineering, Politehnica University Timișoara

Organizers: • Politehnica University Timisoara, Department of Mathematics, together with Romanian Academy – Timisoara branch

Web: <https://icma.upt.ro/>

• "The 16th International Conference on Mathematics and its Applications" serves as an outstanding global forum for the dissemination of knowledge and findings in the domains of mathematics and its applications, encompassing theory, methodology, and practical applications.

• The conference welcomes significant contributions in all major areas of mathematics and its applications, both in theoretical and applied dimensions. Its primary objective is to establish a platform where researchers and professionals from academia and industry can convene to share the latest advancements in the field.

Topics: • All the research areas of Mathematical Analysis and Applications;

• All the research areas of Applied Mathematics in Engineering and Economics;

• Probability and Statistics in Health and Clinical Research;

• All the research areas of Algebra, Geometry and related topics

Publication of papers:

– The proceedings of the ICMA 2025 conference are published in a volume edited by Politehnica Publishing House. Selected papers in extended form will be published in **Scientific Bulletin of Politehnica University Timisoara, Transactions on Mathematics and Physics**.



The 18th International Conference on Acoustics and Vibration of Mechanical Structures – AVMS 2025

30–31 May 2025, Timișoara, Romania, with in-person and online participation

Organizers:

• Politehnica University Timisoara • University of Niš-Serbia

• Romanian Academy-Timisoara Branch • Romanian Acoustical Society

• Technical Sciences Academy of Romania

Web: <https://mrm.mec.upt.ro/avms/>

• The conference focused on a broad range of topics related to acoustics and vibration, such as noise and vibration control, noise and vibration generation and propagation, effects of noise and vibration, condition monitoring and vibration testing, modelling, prediction and simulation of noise and vibration, environmental and occupational noise and vibration, noise and vibration attenuators, biomechanics and bioacoustics.

• The book also discusses analytical, numerical and experimental techniques applicable to analyze linear and non-linear noise and vibration problems (including strong nonlinearity) and it is primarily intended to emphasize the actual trends and state-of-the-art developments in the above-mentioned topics.

• The primary audience of this conference consists of academics, researchers and professionals, as well as PhD students concerned with various fields of acoustics and vibration of mechanical structures.

Publication of papers:

– Springer Proceedings in Physics, ISSN 0930-8989, <https://link.springer.com/book/10.1007/978-3-032-10786-2>



E³UDRES² – Ent-re-novators PhD Summer School 2025 – Open Practices in Higher Education

2-6 June 2025, Hybrid: Zoom and Room K1 & Multifunctional Room, Conference Center of the Politehnica University Timisoara

Organizers: • Politehnica University Timisoara, through the Department of ID/IFR;

- Digital Education (DeL);
- E³UDRES²—Ent-r-e-novators project.

Web: <https://elearning.upt.ro/en/noutati/e%c2%b3udres%c2%b2-ent-r-e-novators-phd-summer-school-2025-hundreds-of-international-students-dozens-of-international-experts/>

• The event brought together a vibrant academic community in Timișoara, both physically and online: over 70 PhD students and young researchers from 22 countries (Romania, Portugal, Italy, Belgium, Latvia, Hungary, the Netherlands, Austria, Kenya, Germany, Pakistan, Philippines, Ukraine, Greece, Sri Lanka, Bangladesh, Iran, India, Indonesia, Syria, Ecuador, and Morocco).

• These students represented 12 universities and interacted with 14 internationally recognized speakers in their fields, from Romania, Portugal, Italy, Belgium, Latvia, Hungary, the Netherlands, and Austria, leading a series of intensive sessions, ranging from cutting-edge information presentations to valuable practical workshops. All presentations were conducted in English and approached topics such as Artificial Intelligence, Open Education, Open Science, Open Publishing, Open Data, Digital Tools for Research and Open Innovation. Students were awarded official participation certificates, recognized for 2 ECTS credits, confirming the successful completion of the required criteria for the post-university training, validated by Politehnica University Timisoara, Romania, for activities held both in Timișoara and online. In addition, participants also received two open digital certificates: one for completing the MOOCs (Massive Open Online Courses) focused on Licensing and Open Licensing, and a second open digital certificate confirming the completion of learning modules on the new Arena Hub E³UDRES² platform.

Publication of papers: The presentations are published on the Arena platform of the E³UDRES² European Universities Alliance, at:

<https://arena.eudres.eu/>.



The XV International Conference "INDUSTRIAL ENGINEERING AND ENVIRONMENTAL PROTECTION" (IIZS2025)

October 2 – 3, 2025, Zrenjanin, Serbia

Organizers: • University of Novi Sad, Technical Faculty "Mihajlo Pupin", Zrenjanin, SERBIA, in cooperation with partners: • Politehnica University Timisoara, Faculty of Engineering, Hunedoara, ROMANIA, University "St. Kliment Ohridski", Technical Faculty, Bitola, MACEDONIA, "Aurel Vlaicu" University of Arad, Faculty of Engineering, Arad, ROMANIA, University of East Sarajevo, Faculty of Mechanical Engineering East Sarajevo, BOSNIA & HERZEGOVINA and University of Giresun, Faculty of Engineering, Giresun, TURKEY

Web: <http://www.tfzr.uns.ac.rs/iizs/>

The main goals of the conference are: • innovation and expansion of knowledge engineers in industry and environmental protection;

- support to researchers in presenting the actual results of research projects, establishing new contacts with leading national and international institutions and universities;
- popularization of the faculty and its leading role in our society and the immediate environment, in order to attract quality young population for studying at our faculty, cooperation with other organizations, public companies and industry;
- initiative for collecting ideas in solving specific practical problems; • interconnection and business contacts; introducing professional and business organizations with results of scientific and technical research; presentation of scientific knowledge and exchange of experiences in the field of industrial engineering.

Framework topics: • INDUSTRIAL ENGINEERING: • Mechanical Engineering, • Energetics and process technique, • Designing and maintenance, • Oil and gas engineering • ENVIRONMENTAL ENGINEERING: • Health and environmental protection, • Environmental Management, • Occupational Safety

Publication of papers:

– **Proceedings of INTERNATIONAL CONFERENCE INDUSTRIAL ENGINEERING AND ENVIRONMENTAL PROTECTION** (15; 2025; Zrenjanin), published by University of Novi Sad, Technical Faculty "Mihajlo Pupin", Zrenjanin, SERBIA (<https://doi.ub.kg.ac.rs/iizs2025/>)

ICSTCC 2025

29th International Conference on System Theory, Control and Computing – ICSTCC 2025

October 9–11, 2025, DoubleTree by Hilton Cluj – City Plaza, Romania

Organizers: • Politehnica University Timisoara (Co-organizer)

Web: <https://icstcc2025.utcluj.ro/>

ICSTCC 2025 has featured several kinds of presentations, including invited talks, contributed papers and special sessions.

• The outcome of the conference has been a better understanding of some leading research areas, as already System Theory, Control and Computing have demonstrated.

ICSTCC 2025 has welcomed papers on the following topics:

- **Automation and Robotics:** Linear and Nonlinear Control System Design, System Identification and Process Modeling, Robust and Adaptive Control, Robotics and Intelligent Control, Applications and Case Studies in Automation and Robotics, Embedded Systems;
- **Computer Science and Engineering:** Distributed Systems and Software Engineering, Databases, Systems of Programs and Expert Systems, Web Services, Internet Security, Software Tools and Methods, Grid Computing, Artificial Intelligence, Computer Architectures;
- **Electronics and Instrumentation:** Modeling, Simulation and CAD Tools, Signal Processing and Communication Systems, Linear and Nonlinear Circuits and Systems, Evolutionary Electronics.

Publication of papers:

- The proceedings, which include the papers presented at ICSTCC 2025, will be submitted to IEEE Xplore Digital Library.



The 24th International Conference of Nonconventional Technologies – ICNcT Conference 2025

• 22–24 October 2025, UPT, Mechanical Engineering Faculty, Mihai Viteazul Street 1, (Rooms: M104, M301, M003, M005), Timisoara, Romania, Hybrid format

• **Organized by:** • Politehnica University Timișoara, in cooperation with: • Lucian Blaga University of Sibiu, • Romanian Association for Nonconventional Technologies, Romanian Association for Alternative Technologies Sibiu, Under the aegis of: • Ministry of Education and Research, • Academy of Romanian Scientists, Academy for Technical Sciences of Romania, In collaboration with: • Ioan Slavici University of Timișoara, Aurel Vlaicu University of Arad, • National R&D Institute for Welding and Material Testing – ISIM Timișoara, • University of Nyíregyháza, Hungary, Higher Education Technical School of Professional Studies in Novi Sad, Serbia, General Association of Engineers in Romania (A.G.I.R.) – Timiș Branch, Romanian Association of Building Services Engineers – AIR, Timiș Branch.

Web: <http://www.artn.ro/conference2025/>

– The theme for the current edition is: **The nonconventional approach to technologies - an important chance for progress**

– Topics:

- Basic physical phenomena and processes of the nonconventional procedures; • Experimental research for nonconventional processing technologies;
- Micro and nanotechnologies and materials for complex processes; • Nonconventional and additive approaches for quick response manufacturing;
- Nonconventional technologies management and other nonconventional processes; • Nonconventional forms of energy and low carbon systems;
- The intersection of nonconventional technologies and other domains. • Advanced Nanostructured and Bio Materials;
- Nonconventional Forms of Energy and Environmental Impact;

Publication of papers:

– **Nonconventional Technologies Review:**

<http://revtn.ro/index.php/revtn>

This journal is indexed in ProQuest, EBSCOhost, DOAJ, Index Copernicus, Google Scholar and CAB Abstracts.



SIM 2025: 18th International Symposium in Management - Optimizing the Future: Management Innovation for a Sustainable World

24-25 October 2025, Romania, Timisoara, UPT Conference Center (Bd. Vasile Pârvan No. 2 B)

Organizers:

- West University of Timisoara – Department of Management and Entrepreneurship / Faculty of Economics and Business Administration
- Politehnica University Timisoara – Department of Management / Faculty of Management in Production and Transportation
- Web: <https://sim2025.eu/index.html>

- Jointly organized by the Western University of Timișoara and Politehnica University Timișoara, the 2025 conference will explore the theme "Optimizing the Future: Management Innovation for a Sustainable World."
- Bringing together academics, professionals, and students, SIM 2025 will focus on how management can drive sustainable growth and long-term resilience.
- Key discussions will address the evolving role of management in an ever-changing global landscape, the innovative strategies needed to tackle emerging challenges, and the balance between economic success and sustainability.
- Through presentations and collaborative exchanges, **SIM 2025** aims to inspire forward-thinking solutions that will shape a more sustainable future for businesses and society.
- **Conference Topics:** • Management of Innovation; •Business Process Management; •Entrepreneurship and Innovation; •Financial Management and Financial Governance; •Strategic Management; •Change Management; •Supply Chain and Operations Management; •Sustainable Management; •The Economics of Small and Medium-Sized Enterprises; •Third Sector Organizations Management.

Publication of papers: Based on the selection during the peer review process, papers will be published in the following venues:

- **ENGINEERING AND MANAGEMENT BOOK SERIES – TRIVENT PUBLISHING:**

<https://trivent-publishing.eu/90-engineering-and-management>

- **ACTA TECHNICA NAPOCENSIS SERIES - APPLIED MATHEMATICS, MECHANICS AND ENGINEERING:**

<https://atna-mam.utcluj.ro/index.php/Acta/about>



The 16th International Conference "Innovative Technologies for Joining Advanced Materials – TIMA25"

06-07 November 2025, Politehnica University Timisoara, Faculty of Automation and Computing, A101 and A110 (participation face-to-face and online)

Organizers:

- National R&D Institute for Welding and Material Testing – ISIM Timisoara
 - Politehnica University Timisoara
 - Technical Sciences Academy of Romania – Timisoara Branch, with the support of Ministry of Education and Research
- Web: <https://www.isim.ro/ro/transfer-tehnologic/tima/tima25>
<https://www.facebook.com/ISIM.Timisoara>

Topics:

- New joining technologies;
- Modelling and simulation of welding processes;
- Specific problems in advanced materials joining;
- Characterization of advanced materials and joints;
- Fracture mechanics, damage of advanced materials and remaining life assessment;
- Quality of welded joints and welded structures;
- Engineering applications of surface coatings;
- Non-Destructive Testing (NDT);
- Nanoscience, nanotechnology and composites.

Publication of papers:

Selected papers of the Conference will be indexed in major international databases, ISI or SCOPUS.

(<https://www.scientific.net/>)



innoCENTA 2025 - International Exhibition of Innovation and Technological Transfer
06-07 November 2025, Politehnica University Timisoara, Faculty of Automation and Computing, A101 and Faculty Hall (participation face-to-face and online)

Organizers:

- National R&D Institute for Welding and Material Testing – ISIM Timisoara,
- Politehnica University Timisoara • Technical Sciences Academy of Romania – Timisoara Branch with the support of Ministry of Education and Research

Web: <https://www.isim.ro/ro/transfer-tehnologic/festival-innocenta/festival-innocenta-2025>
<https://www.facebook.com/ISIM.Timisoara>

Topics:

- Energy, Environment, Biotechnology • Nanotechnologies, Advanced Materials, Metallurgy, Civil Construction
- Computer Science, Electronics, Electrical Engineering • Automotive, Space, Aviation, Naval, Mechanics
- Education, Books, History, Cultural Studies • Medicine, Pharmacy, Cosmetics, Hygiene
- Agriculture, Veterinary Medicine • Food & Beverage, HORECA & Spa
- Textiles, Fashion, Handmade • Kids Corner, Games, Outdoor
- Research and Development Projects

• Publication of papers:

- Technology Catalog from the innocenta.ro Platform: <https://innocenta.ro/en/technologies/default>
- Patent Database – innocenta.ro Platform: <https://www.innocenta.ro/en/patents>



Advances in 3OM (Opto-Mechatronics, Opto-Mechanics, and Optical Metrology) and Photonics Technologies

8-11 December 2025, Conference Center of UPT, Timisoara, Romania

Organizers:

- 3OM Research Group
- Politehnica University Timisoara

Web: <https://3om-group-optomechatronics.ro/advances-in-3om-conference-2025/>

- The Conference aims to connect specialists from diverse fields related to **Optics and Photonics**, two key enabling technologies at European and global level. Supported by **SPIE – The International Society for Optics and Photonics**, the event will feature sessions on major infrastructure programs such as **Extreme Light Infrastructure (ELI)** and the Romanian **IPCEI (Important Project of Common European Interest)** on microelectronics, fostering collaboration between scientific communities in **Physics, Electrical and Mechanical Engineering, and Medicine**.
- The ultimate goal is to establish a **Romanian Optics & Photonics Platform**, linking academia and industry, setting national priorities, and strengthening international partnerships in domains that contribute significantly to global GDP.
- Topics include: **Optics & Photonics, Laser Systems, Optical Design, Biomedical Imaging, Optical Metrology, Hybrid photonic-microelectronic systems, Non-Destructive Testing (NDT) and Applications in Medicine and advanced materials.**

Publication of papers:

- **Proceedings:** All accepted and presented contributions will be published in the Proceedings of SPIE, indexed in ISI Web of Science
- **Special Issues:** Papers recommended by the Scientific Committee may be submitted for publication in Special Issues of several high-impact journals. These submissions will undergo the standard peer-review process. For this 3rd edition of the conference, multiple prestigious international journals are targeted: **Special Issue of Sensors, Special Issue of Photonics, Topical Collection of Materials, Topical Collection of Medicina-Lithuania, Special Issue of Applied Sciences.**



International Digital Skills Workshop 2025: Developing Digital Skills for Resilience

12 December 2025, Hybrid: Zoom and Room K1, Conference Center of Politehnica University Timisoara

Organizers: • Department of ID/IFR and Digital Education (DeL) and the Multimedia Center, in collaboration with the Alliance of European Universities E³UDRES² partners, benefiting from the support IEEE Education Romania and projects Accelerate Future HEI and Erasmus+ LECTURE

• Web: <https://elearning.upt.ro/en/proiecte/proiecte-eu/peste-800-de-participanti-la-a-x-a-editie-a-workshop-international-competente-digitale-2025-al-upt-dedicat-rezilientei-digitale/>

- The event brought together 65 participants on-site, along with other 750 participants online, via Zoom. The main topic of this edition focused on **"Developing digital skills for resilience"**, emphasizing the need to equip educators, students, and citizens with the skills needed to navigate and thrive in an ever-changing digital environment.
- The workshop addressed a broad audience, including actors from the fields of education and research, as well as interested citizens from the community, with 18 international speakers from Romania, Ukraine, Germany, Spain and Italy. The discussions focused on the **Digital Competence Framework 3.0 (DigComp 3.0)** of the European Union and the importance of digital resilience in education, research and community.
- An important component of this edition was the participation of university professors from Ukraine, during a Study Visit to Timișoara within the Erasmus+ Lecture project, hosted by DeL – UPT.
- The presentations were held in **English** and **Ukrainian** – with **live Ukrainian-Romanian interpretation** for the audiences. The sessions were highly interactive, with participants asking dozens of questions both on-site, in the room, and online, with real-time interaction being efficiently facilitated through the Menti App, which allowed for rapid and anonymous collection of feedback and questions, integrating the online and physical audience into a unified dialogue.
- **Publication of papers:** All presentations are available online on the site of the workshop series, at <https://elearning.upt.ro/en/ws-digital-skills/> and on the UPT's UniCampus platform, at <https://unicampus.ro/>

SCIENTIFIC JOURNALS



Transactions on Modern Languages Volume 24, Issue 1, 2025

<https://www.sc.upt.ro/ro/publicatii/buletinul-stiintific/issues-bs/854-24-2025>

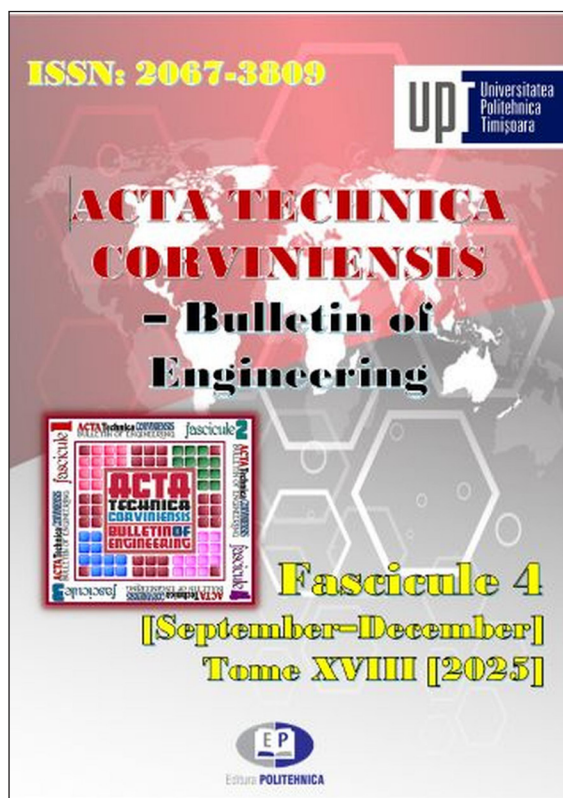
- The Transactions on Modern languages, published by the Department of Communication and Foreign Languages, has its origin in The Social Science and Humanities Series, started in 1991 under ISSN 1223-1959.
- The **Transactions of Modern Languages** publishes original papers in all areas of theoretical and applied linguistics: Linguistics, Translation and Interpreting Studies, Discourse Analysis, Pragmatics, Rhetoric, Terminology, LSP, Foreign Language Teaching.
- The journal is included in the CEEOL, Fabula and EBSCO data bases.
- ISSN 1583-7467, ISSN-L 1583-7467



Transactions on Mathematics and Physics Volume 70 (84), Issue 1, 2025

[https://arhiva.upt.ro/img/files/buletin_stiintific/mate/Buletin_2025-Vol70\(84\).pdf](https://arhiva.upt.ro/img/files/buletin_stiintific/mate/Buletin_2025-Vol70(84).pdf)

- The journal "Bulletin Scientifique de l'Ecole Polytechnique de Timișoara" was founded in 1923, when the head of the Polytechnical School of Timișoara was mathematicians Victor Vâlcovici (1885-1970).
- The first two issues appeared in 1925, respectively in 1926. In the first years, the journal has been contained mostly the mathematical articles (the authors being some famous national and foreign mathematicians as well V. Alaci, G. Alexich, M. Ghermănescu, D. Pompeiu, Ch. Brunold, G. Bouligand). This fact confer to actual journal "Transactions on Mathematics and Physics" of the Scientific Bulletin of Politehnica University Timișoara, Romania the justification to realize the continuity of the old "Bulletin Scientifique".
- The **Transactions on Mathematics and Physics** is indexed CNCIS, B+.
- ISSN 1224-6069, ISSN-L 1224-6069



ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering

<http://acta.fih.upt.ro/>

Volume XVIII (Tome XVIII), Year 2025

Issue 1 (Fascicule 1: January–March), Issue 2 (Fascicule 2: April–June), Issue 3 (Fascicule 3: July–September), Issue 4 (Fascicule 4: October–December)

- ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is an independent, free-access, online, international and multidisciplinary scientific publication edited by the Politehnica University Timișoara, Faculty Engineering Hunedoara and Faculty of Mechanical Engineering Timișoara.
- The Journal is focused on engineering sciences and other innovative allied research areas, in all fields of science and technology based on its originality, importance and timeliness.
- ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is accredited and ranked in the “B+” CATEGORY Journal by The National University Research Council’s Classification of Romanian Journals (CNCIS), and is indexed by Index Copernicus, Google Scholar, EBSCO Publishing, DOAJ, SCIRUS, EVISA, ProQuest, DRJI, CAS, BASE, ULRICHsweb – Global serials directory, Directory Indexing of International Research Journals, Electronic Journals Library etc.



ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering

<http://annals.fih.upt.ro/>

Volume XXIII (Tome XXIII), Year 2025

Issue 1 (Fascicule 1: February), Issue 2 (Fascicule 2: May), Issue 3 (Fascicule 3: August), Issue 4 (Fascicule 4: November)

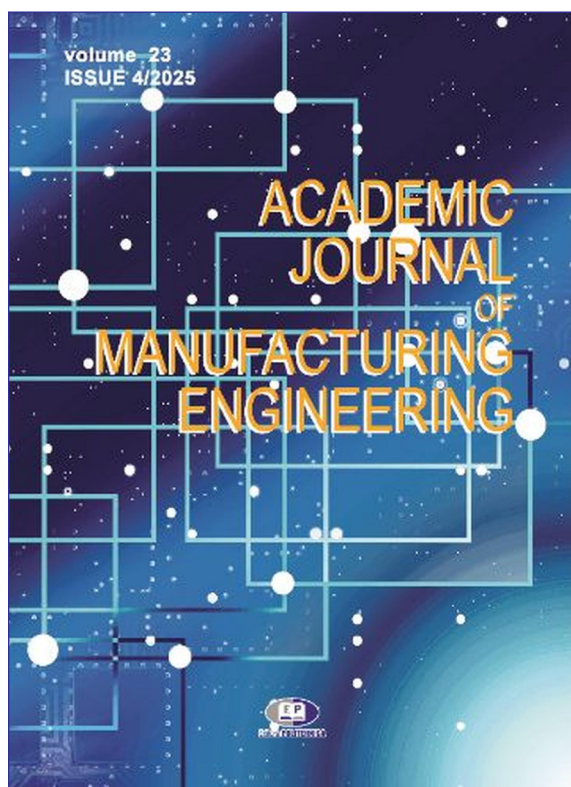
- ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering is a multi-disciplinary journal, which covers all aspects of scientific, engineering and technical disciplines including applications of scientific inventions for engineering, technological and industrial purposes, advances in engineering, technology and science.
- ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering is accredited and ranked in the “B+” category by The National University Research Council’s Classification of Romanian Journals (CNCIS), and is indexed by Index Copernicus, Google Scholar, EBSCO Publishing, DOAJ, SCIRUS, EVISA, ProQuest, DRJI, CAS, BASE, ULRICHsweb – Global serials directory, Directory Indexing of International Research Journals, Electronic Journals Library etc.



Nonconventional Technologies Review Volume XXIX, Issue 1, Issue 2, Issue 3, Issue 4, 2025

www.revtn.ro

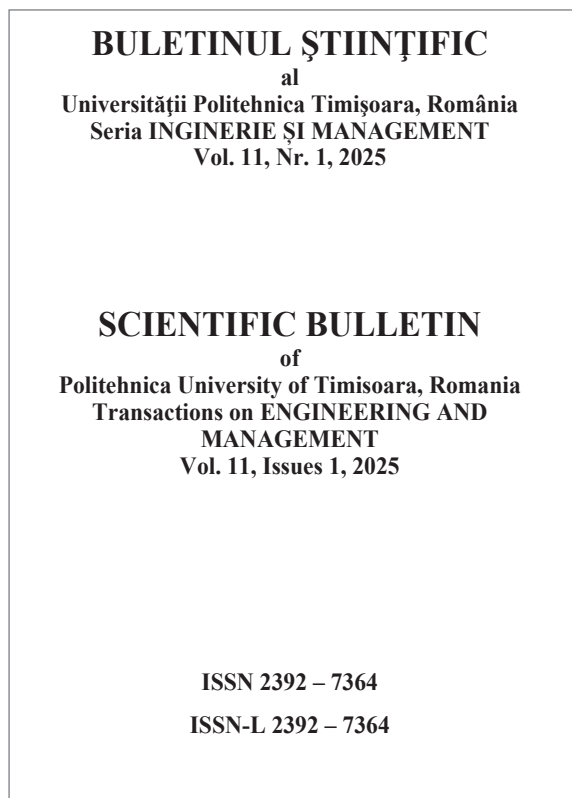
- The Nonconventional Technologies Review is a scientific engineering publication of the Romanian Association for Nonconventional Technologies (ARTN), which has started in 1997, with quarterly appearances. The publication is addressed to all engineers and scientists interested in nonconventional technologies.
- Nonconventional Technologies Review is indexed in ProQuest, EBSCOhost, DOAJ, Google Scholar and Index Copernicus, and is classified as B+ according to the Romanian journal system.
- ISSN codes are:
Print ISSN: 2359-8646; ISSN-L: 2359-8646
On-line ISSN: 2359-8654



Academic Journal of Manufacturing Engineering Volume 23, Issue 1, Issue 2, Issue 3, Issue 4, 2025

<https://www.ajme.ro>

- The Academic Journal of Manufacturing Engineering intends to provide the specialists in the manufacturing engineering field a possibility for sharing and exchanging results and information by publishing the results of their work.
- Academic Journal of Manufacturing Engineering is recognized as a B+ journal by the Romanian National Council of Scientific Research and indexed by Index Copernicus international database.
- ISSN: 1583-7904, Online ISSN: 2601-3045



Transactions on Engineering and Management Volume 11, Issues 1, 2025

https://mpt.upt.ro/wp-content/uploads/2025/07/Buletin-St_vol-11_issue-1_2025.pdf

- The Scientific Bulletin of Politehnica University Timișoara, Transaction on Engineering and Management presents research results in the field of industrial management and business studies that are of significant impact on major contemporary issues.
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Transactions on Hydrotechnics Volume 70 (84), Issue 1, 2025

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- ISSN 1224-6042, ISSN-L 1224-6042

ISI PAPERS IN HIGHLIGHT

Web of Science - Clarivate Analytics Hot Papers

A paper published in the past two years that received a number of citations in the most recent two-month period that places it in the top 0.1% of papers in the same field.

1

Liga, S., Paul, C., Péter, F. Flavonoids: Overview of Biosynthesis, Biological Activity, and Current Extraction Techniques, PLANTS-BASEL, Volume: 12, Issue: 14, Article Number: 2732, PubMed ID: 37514347, ISSN: 2223-7747, 2023.
Times Cited in Web of Science Core Collection: 200



2

Di Valentino, E., Said, J. L., (. .) Pop, N. (Pop, Nicolina), (. .) Piao, Y.-S., Davari, Z. The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics, PHYSICS OF THE DARK UNIVERSE, Volume: 49, Article Number: 101965, 2025.
Times Cited in Web of Science Core Collection: 127

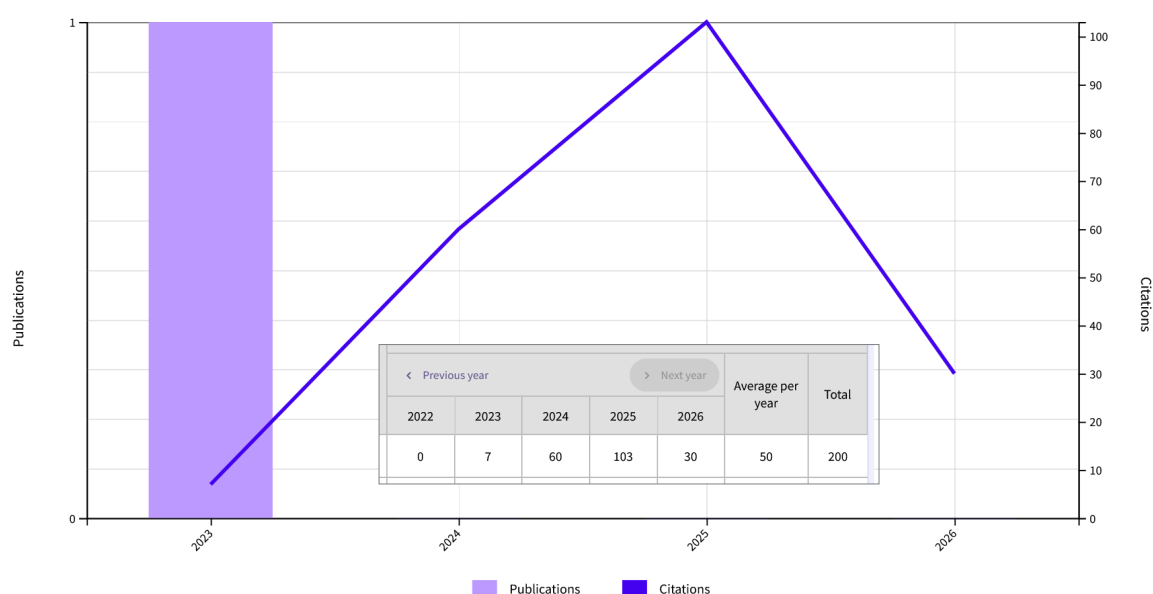


Hot papers are papers that receive a large number of citations soon after publication, relative to other papers of the same field and age. They are papers published in the past two years that received a number of citations in the most recent two-month period that places them in the top 0.1% of papers in the same field.

* The data was obtained from Web of Science - Clarivate Analytics in 23 March 2026

Web of Science - Clarivate Analytics Hot Paper

This hot paper was published in the past two years and received enough citations in January-June 2025 to place it in the top 0.1% of papers in the academic field of **Plant & Animal Science**.



1

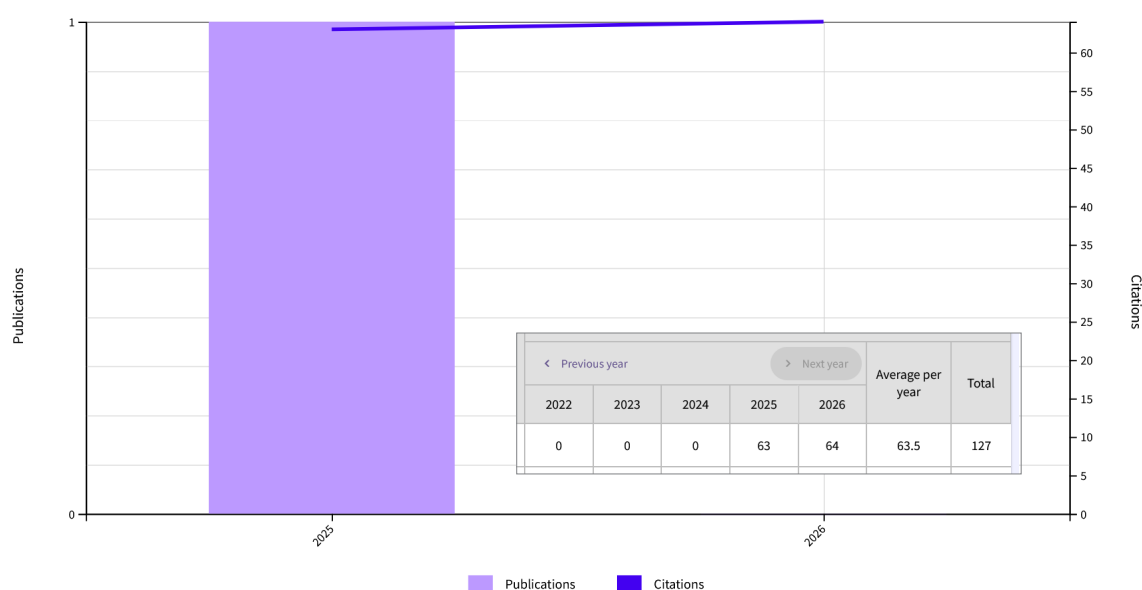
Liga, S., Paul, C., Péter, F. Flavonoids: Overview of Biosynthesis, Biological Activity, and Current Extraction Techniques, PLANTS-BASEL, Volume: 12, Issue: 14, Article Number: 2732, PubMed ID: 37514347, ISSN: 2223-7747, 2023.
Times Cited in Web of Science Core Collection: 200

Abstract: Recently, increased attention has been paid to natural sources as raw materials for the development of new added-value products. Flavonoids are a large family of polyphenols which include several classes based on their basic structure: flavanones, flavones, isoflavones, flavonols, flavanols, and anthocyanins. They have a multitude of biological properties, such as anti-inflammatory, antioxidant, antiviral, antimicrobial, anticancer, cardioprotective, and

neuroprotective effects. Current trends of research and development on flavonoids relate to identification, extraction, isolation, physico-chemical characterization, and their applications to health benefits. This review presents an up-to-date survey of the most recent developments in the natural flavonoid classes, the biological activity of representative flavonoids, current extraction techniques, and perspectives.

Web of Science - Clarivate Analytics Hot Paper

This hot paper was published in the past two years and received enough citations from September to December 2025 to place it in the top 0.1% of papers in the academic field of **Space Science**.



2

Di Valentino, E., Said, J. L., (. . .) Pop, N. (Pop, Nicolina), (. . .) Piao, Y.-S., Davari, Z. The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics, PHYSICS OF THE DARK UNIVERSE, Volume: 49, Article Number: 101965, eISSN: 2212-6864, 2025.

Times Cited in Web of Science Core Collection: 127

Abstract: The standard model of cosmology has provided a good phenomenological description of a wide range of observations both at astrophysical and cosmological scales for several decades. This concordance model is constructed by a universal cosmological constant and supported by a matter sector described by the standard model of particle physics and a cold dark matter contribution, as well as very early-time inflationary physics, and underpinned by gravitation through general relativity. There have always been open questions about the soundness of the foundations of the standard model. However, recent years have shown that there may also be questions from the observational sector with the emergence of

differences between certain cosmological probes. In this White Paper, we identify the key objectives that need to be addressed over the coming decade together with the core science projects that aim to meet these challenges. These discordances primarily rest on the divergence in the measurement of core cosmological parameters with varying levels of statistical confidence. These possible statistical tensions may be partially accounted for by systematics in various measurements or cosmological probes but there is also a growing indication of potential new physics beyond the standard model (...)

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1

Rajak, D.K., Pagar, D.D., Menezes, P.L., Linul, E. Fiber-Reinforced Polymer Composites: Manufacturing, Properties, and Applications, POLYMERS, Volume: 11, Issue: 10, Article Number: 1667, PubMed ID: 31614875, eISSN: 2073-4360, 2019;
Times Cited in Web of Science Core Collection: 1156



2

Ancuti, C.O., Ancuti, C., De Vleeschouwer, C., Bekaert, P. Color Balance and Fusion for Underwater Image Enhancement, IEEE TRANSACTIONS ON IMAGE PROCESSING, Volume: 27, Issue: 1, Pages: 379-393, PubMed ID: 28981416, ISSN: 1057-7149, eISSN: 1941-0042, 2018;
Times Cited in Web of Science Core Collection: 991



3

Sarbu, I., Sebarchievici, C. A Comprehensive Review of Thermal Energy Storage, SUSTAINABILITY, Volume: 10, Issue: 1, Article Number: 191, ISSN: 2071-1050, 2018;
Times Cited in Web of Science Core Collection: 912



4

Covaci, C., Gontean, A. Piezoelectric Energy Harvesting Solutions: A Review, SENSORS, Volume: 20, Issue: 12, Article Number: 3512, PubMed ID: 32575888, eISSN: 1424-8220, 2020;
Times Cited in Web of Science Core Collection: 485



5

Ardean, C., Davidescu, C.M., Nemes, N.S., Negrea, A., Ciopec, M., Duteanu, N., Negrea, P., Duda-Seiman, D., Musta, V. Factors Influencing the Antibacterial Activity of Chitosan and Chitosan Modified by Functionalization, INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES, Volume: 22, Issue: 14, Article Number: 7449, PubMed ID: 34299068, eISSN: 1422-0067, 2021;
Times Cited in Web of Science Core Collection: 432



6

Albulescu, C.T. COVID-19 and the United States financial markets' volatility, FINANCE RESEARCH LETTERS, Volume: 38, Article Number: 101699, PubMed ID: 32837380, ISSN: 1544-6123, eISSN: 1544-6131, 2021;
Times Cited in Web of Science Core Collection: 362



Highly Cited Papers received enough citations as of January/December 2025 to place them in the top 1% of their academic fields based on a highly cited threshold for the field and publication year.

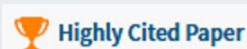
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Web of Science - Clarivate Analytics Highly Cited Papers

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7

Rajak, D.K.; Wagh, P.H.; Linul, E. Manufacturing Technologies of Carbon/Glass Fiber Reinforced Polymer Composites and Their Properties: A Review, POLYMERS, Volume: 13, Issue: 21, Article Number: 3721, PubMed ID: 34771276, eISSN: 20734360, 2021;
Times Cited in Web of Science Core Collection: 310



8

Sarbu, I., Dorca, A. Review on heat transfer analysis in thermal energy storage using latent heat storage systems and phase change materials, INTERNATIONAL JOURNAL OF ENERGY RESEARCH, Volume: 43, Issue: 1, Pages: 29-64, ISSN: 0363-907X, eISSN: 1099-114X, 2019;
Times Cited in Web of Science Core Collection: 249



9

Roman, R.C., Precup, R.E., Petriu, E.M. Hybrid data-driven fuzzy active disturbance rejection control for tower crane systems, EUROPEAN JOURNAL OF CONTROL, Volume: 58, Pages: 373-387, ISSN: 0947-3580, eISSN: 1435-5671, 2021;
Times Cited in Web of Science Core Collection: 227



10

Liga, S., Paul, C., Péter, F. Flavonoids: Overview of Biosynthesis, Biological Activity, and Current Extraction Techniques, PLANTS-BASEL, Volume: 12, Issue: 14, Article Number: 2732, PubMed ID: 37514347, ISSN: 2223-7747, 2023;
Times Cited in Web of Science Core Collection: 200



11

Pozna, C., Precup, R.E., Horvath, E., Petriu, E.M. Hybrid Particle Filter-Particle Swarm Optimization Algorithm and Application to Fuzzy Controlled Servo Systems, IEEE TRANSACTIONS ON FUZZY SYSTEMS, Volume: 30, Issue: 10, Pages: 4286-4297, ISSN: 1063-6706, eISSN: 1941-0034, 2022;
Times Cited in Web of Science Core Collection: 194



12

Tmusic, G., Manfreda, S., Aasen, H., James, M.R., Goncalves, G., Ben-Dor, E., Brook, A., Polinova, M., Arranz, J.J., Meszaros, J., Zhuang, R.D., Johansen, K., Malbeteau, Y., de Lima, I.P., Davids, C., Herban, S., McCabe, M.F. Current Practices in UAS-based Environmental Monitoring, REMOTE SENSING, Volume: 12, Issue: 6, Article Number: 1001, eISSN: 2072-4292, 2020;
Times Cited in Web of Science Core Collection: 186



Highly Cited Papers received enough citations as of January/December 2025 to place them in the top 1% of their academic fields based on a highly cited threshold for the field and publication year.

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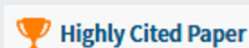
13

Zamfirache, I.A., Precup, R.E., Roman, R.C., Petriu, E.M. Policy Iteration Reinforcement Learning-based control using a Grey Wolf Optimizer algorithm, INFORMATION SCIENCES, Volume: 585, Pages: 162-175, ISSN: 0020-0255, eISSN: 1872-6291, 2021;
Times Cited in Web of Science Core Collection: 168



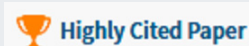
14

Zamfirache, I.A., Precup, R.E., Roman, R.C., Petriu, E.M. Reinforcement Learning-based control using Q-learning and gravitational search algorithm with experimental validation on a nonlinear servo system, INFORMATION SCIENCES, Volume: 583, Pages: 99-120, ISSN: 0020-0255, eISSN: 1872-6291, 2021;
Times Cited in Web of Science Core Collection: 149



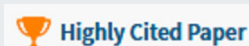
15

Yu, S.B., Abbas, J., Draghici, A., Negulescu, O.H., Ain, N.U. Social Media Application as a New Paradigm for Business Communication: The Role of COVID-19 Knowledge, Social Distancing, and Preventive Attitudes, FRONTIERS IN PSYCHOLOGY, Volume: 13, Article Number: 903082, PubMed ID: 35664180, ISSN: 1664-1078, 2022;
Times Cited in Web of Science Core Collection: 145



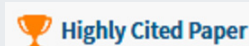
16

DiValentino, E., Said, J. L., (. . .) Pop, N. (Pop, Nicolina), (. . .) Piao, Y.-S., Davari, Z. The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics, PHYSICS OF THE DARK UNIVERSE, Volume: 49, Article Number: 101965, 2025.
Times Cited in Web of Science Core Collection: 127



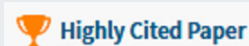
17

Zamfirache, I.A., Precup, R.E., Roman, R.C., Petriu, E.M. Neural Network-based control using Actor-Critic Reinforcement Learning and Grey Wolf Optimizer with experimental servo system validation, EXPERT SYSTEMS WITH APPLICATIONS, Volume: 225, Article Number: 120112, ISSN: 0957-4174, eISSN: 1873-6793, 2023;
Times Cited in Web of Science Core Collection: 117



18

Socoliuc, V., Avdeev, M., Kuncser, V., Turcu, R., Tombácz, E., Vékás, L. Ferrofluids and bio-ferrofluids: looking back and stepping forward, NANOSCALE, Volume: 14, Issue: 13, Pages: 4786-4886, PubMed ID: 35297919, ISSN: 2040-3364, eISSN: 2040-3372, 2022;
Times Cited in Web of Science Core Collection: 108



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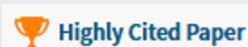
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19

Ali, U.; Ullah, S.; Kamal, B.; Matekovits, L.; Altaf, A. Design, Analysis and Applications of Wearable Antennas: A Review, IEEE ACCESS, Volume: 11, Pages: 14458–14486, ISSN: 21693536, 2023
Times Cited in Web of Science Core Collection: 106



20

Zhou, Y.Y., Draghici, A., Abbas, J., Mubeen, R., Boatca, M.E., Salam, M.A. Social Media Efficacy in Crisis Management: Effectiveness of Non-pharmaceutical Interventions to Manage COVID-19 Challenges, FRONTIERS IN PSYCHIATRY, Volume: 12, Article Number: 626134, PubMed ID: 35197870, ISSN: 1664-0640, 2022;
Times Cited in Web of Science Core Collection: 102



21

Dar, A.A., Hameed, J., Huo, C.H., Sarfraz, M., Albasher, G., Wang, C.Y., Nawaz, A. Recent optimization and paneling measures for green energy projects; insights into CO2 emission influencing to circular economy, FUEL, Volume: 314, Article Number: 123094, ISSN: 0016-2361, eISSN: 1873-7153, 2022;
Times Cited in Web of Science Core Collection: 99



22

Liga, S., Paul, C., Moaca, E.A., Péter, F. Niosomes: Composition, Formulation Techniques, and Recent Progress as Delivery Systems in Cancer Therapy, PHARMACEUTICS, Volume: 16, Issue: 2, Article Number: 223, PubMed ID: 38399277, eISSN: 1999-4923, 2024;
Times Cited in Web of Science Core Collection: 84



23

Roman, R.C., Precup, R.E., Petriu, E.M., Borlea, A.I. Hybrid Data-Driven Active Disturbance Rejection Sliding Mode Control with Tower Crane Systems Validation, ROMANIAN JOURNAL OF INFORMATION SCIENCE AND TECHNOLOGY, Volume: 27, Issue: 1, Pages: 50–64, ISSN: 1453-8245, 2024;
Times Cited in Web of Science Core Collection: 83



24

Zamfirache, I.A., Precup, R.E., Petriu, E.M. Adaptive reinforcement learning-based control using proximal policy optimization and slime mould algorithm with experimental tower crane system validation, APPLIED SOFT COMPUTING, Volume: 160, Article Number: 111687, ISSN: 1568-4946, eISSN: 1872-9681, 2024;
Times Cited in Web of Science Core Collection: 57



Highly Cited Papers received enough citations as of January/December 2026 to place them in the top 1% of their academic fields based on a highly cited threshold for the field and publication year.

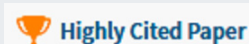
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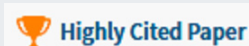
25

Danila, A.I., Ghenciu, L.A., Stoicescu, E.R., Bolintineanu, S.L., Iacob, R., Sandesc, M.A., Faur, A.C. Aldose Reductase as a Key Target in the Prevention and Treatment of Diabetic Retinopathy: A Comprehensive Review, BIOMEDICINES, Volume: 12, Issue: 4, Article Number: 747, PubMed ID: 38672103, eISSN: 2227-9059, 2024; Times Cited in Web of Science Core Collection: 38



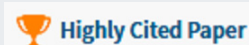
26

Brateanu, A., Balmez, R., Avram, A., Orhei, C., Ancuti, C. LYT-NET: Lightweight YUV Transformer-Based Network for Low-Light Image Enhancement, IEEE SIGNAL PROCESSING LETTERS, Volume: 32, Pages: 2065–2069, ISSN: 1070-9908, eISSN: 1558-2361, 2025; Times Cited in Web of Science Core Collection: 28



27

Precup, R.E., Duca, G., Travin, S., Zinicovscaia, I. PROCESSING, NEURAL NETWORK-BASED MODELING OF BIOMONITORING STUDIES DATA AND VALIDATION ON REPUBLIC OF MOLDOVA DATA, PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A-MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE, Volume: 23, Issue: 4, Pages: 403–410, ISSN: 1454-9069, 2022; Times Cited in Web of Science Core Collection: 27



28

Hu, L.Y., Liao, Y., Gao, K., Jin, S., Precup, R.E. Integration of e-scooter sharing with public transit on employment accessibility and equity, TRANSPORTATION RESEARCH PART D—TRANSPORT AND ENVIRONMENT, Volume: 140, Article Number: 104604, ISSN: 13619209, eISSN: 18792340, 2025; Times Cited in Web of Science Core Collection: 11

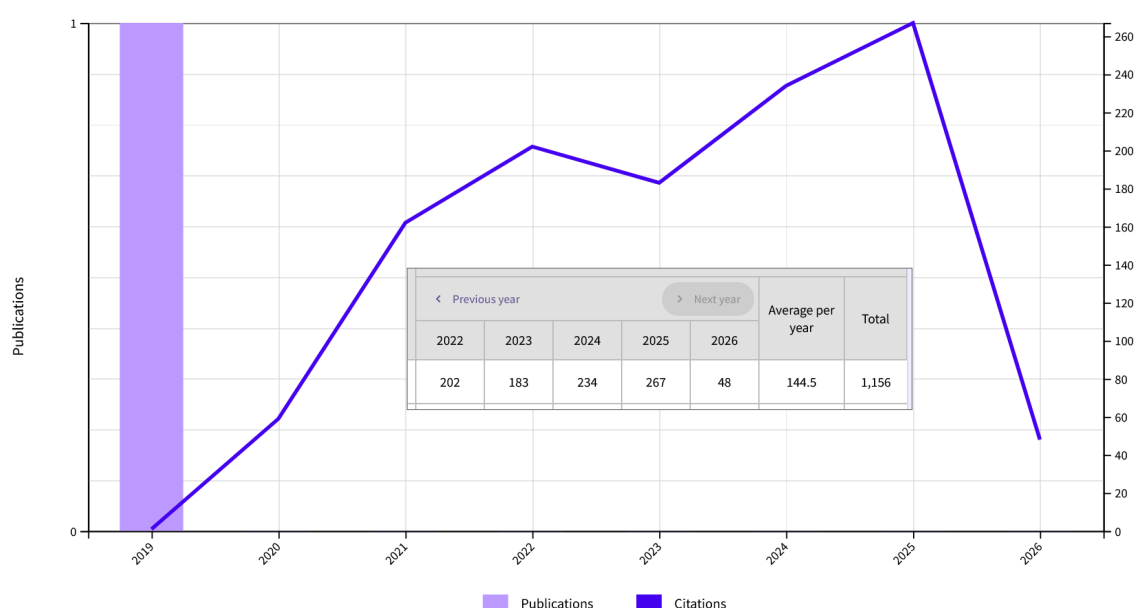


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1

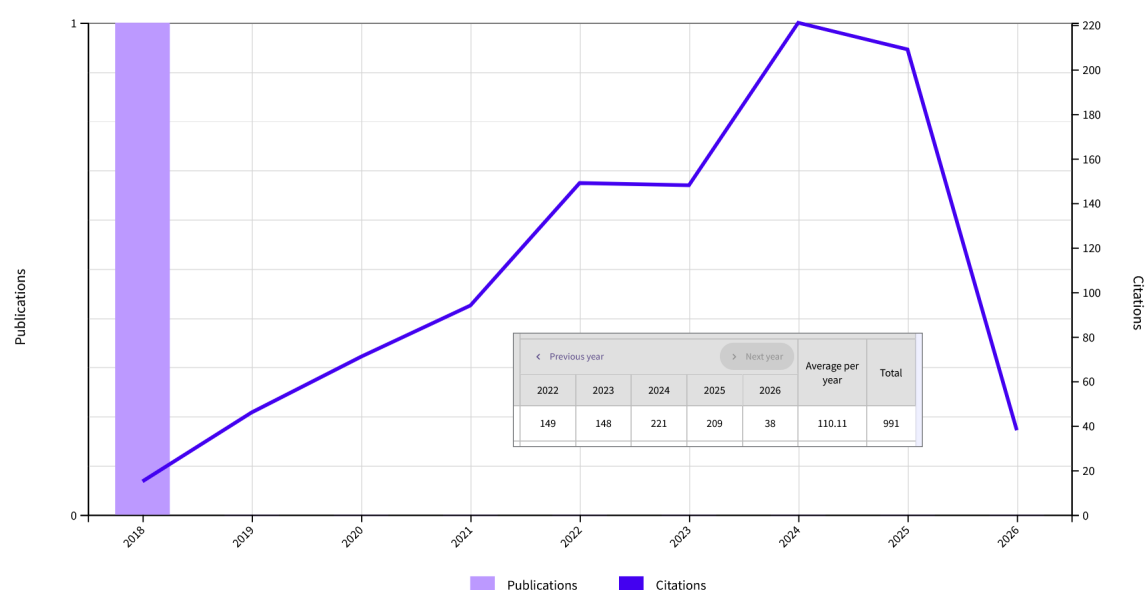
Rajak, D.K., Pagar, D.D., Menezes, P.L., Linul, E. Fiber-Reinforced Polymer Composites: Manufacturing, Properties, and Applications, POLYMERS, Volume: 11, Issue: 10, Article Number: 1667, PubMed ID: 31614875, eISSN: 2073-4360, 2019;
Times Cited in Web of Science Core Collection: 1156

Abstract: Composites have been found to be the most promising and discerning material available in this century. Presently, composites reinforced with fibers of synthetic or natural materials are gaining more importance as demands for lightweight materials with high strength for specific applications are growing in the market. Fiber-reinforced polymer composite offers not only high strength to weight ratio, but also reveals exceptional properties such as high durability; stiffness; damping property; flexural strength; and resistance to corrosion, wear, impact, and fire. These wide ranges of diverse features have led composite materials to find applications in mechanical, construction, aerospace, automobile, biomedical, marine, and many other manufacturing industries. Performance of composite

materials predominantly depends on their constituent elements and manufacturing techniques, therefore, functional properties of various fibers available worldwide, their classifications, and the manufacturing techniques used to fabricate the composite materials need to be studied in order to figure out the optimized characteristic of the material for the desired application. An overview of a diverse range of fibers, their properties, functionality, classification, and various fiber composite manufacturing techniques is presented to discover the optimized fiber-reinforced composite material for significant applications. Their exceptional performance in the numerous fields of applications have made fiber-reinforced composite materials a promising alternative over solitary metals or alloys.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



2

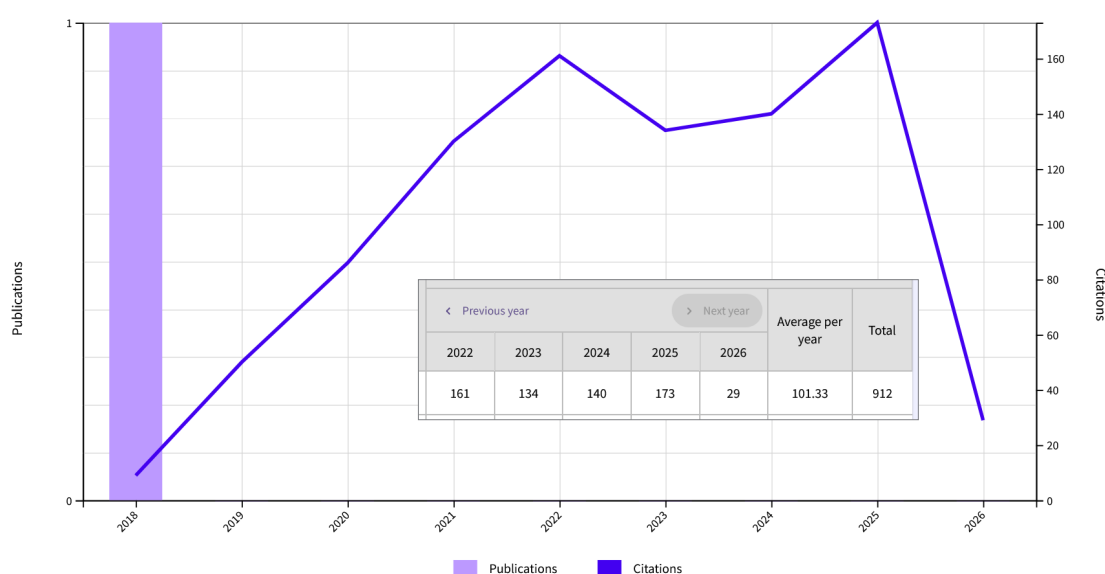
Ancuti, C.O., Ancuti, C., De Vleeschouwer, C., Bekaert, P. Color Balance and Fusion for Underwater Image Enhancement, IEEE TRANSACTIONS ON IMAGE PROCESSING, Volume: 27, Issue: 1, Pages: 379-393, PubMed ID: 28981416, ISSN: 1057-7149, eISSN: 1941-0042, 2018; Times Cited in Web of Science Core Collection: 991

Abstract: We introduce an effective technique to enhance the images captured underwater and degraded due to the medium scattering and absorption. Our method is a single image approach that does not require specialized hardware or knowledge about the underwater conditions or scene structure. It builds on the blending of two images that are directly derived from a color-compensated and white-balanced version of the original degraded image. The two images to fusion, as well as their associated weight maps, are defined to promote the transfer of edges and color contrast to the output

image. To avoid that the sharp weight map transitions create artifacts in the low frequency components of the reconstructed image, we also adapt a multiscale fusion strategy. Our extensive qualitative and quantitative evaluation reveals that our enhanced images and videos are characterized by better exposedness of the dark regions, improved global contrast, and edges sharpness. Our validation also proves that our algorithm is reasonably independent of the camera settings, and improves the accuracy of several image processing applications, such as image segmentation and keypoint matching.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Environment/ Ecology** based on a highly cited threshold for the field and publication year.



3

Sarbu, I., Sebachievici, C. A Comprehensive Review of Thermal Energy Storage, SUSTAINABILITY, Volume: 10, Issue: 1, Article Number: 191, ISSN: 2071-1050, 2018;

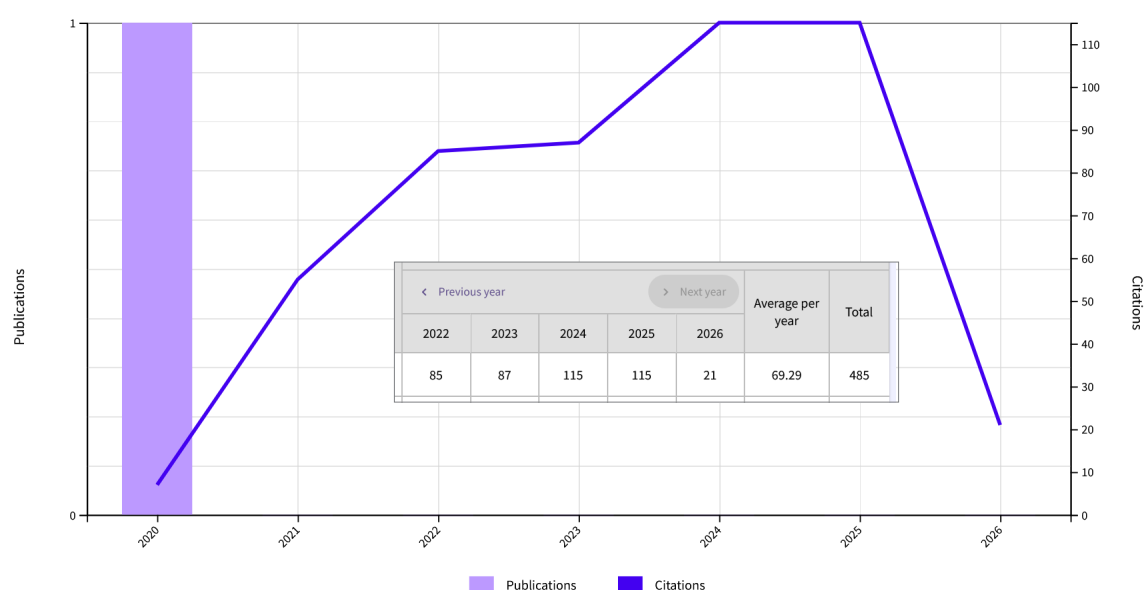
Times Cited in Web of Science Core Collection: 912

Abstract: Thermal energy storage (TES) is a technology that stocks thermal energy by heating or cooling a storage medium so that the stored energy can be used at a later time for heating and cooling applications and power generation. TES systems are used particularly in buildings and in industrial processes. This paper is focused on TES technologies that provide a way of valorizing solar heat and reducing the energy demand of buildings. The principles of several energy storage methods and calculation of storage capacities are

described. Sensible heat storage technologies, including water tank, underground, and packed-bed storage methods, are briefly reviewed. Additionally, latent-heat storage systems associated with phase-change materials for use in solar heating/cooling of buildings, solar water heating, heat-pump systems, and concentrating solar power plants as well as thermo-chemical storage are discussed. Finally, cool thermal energy storage is also briefly reviewed and outstanding information on the performance and costs of TES systems are included.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Chemistry** based on a highly cited threshold for the field and publication year.



4

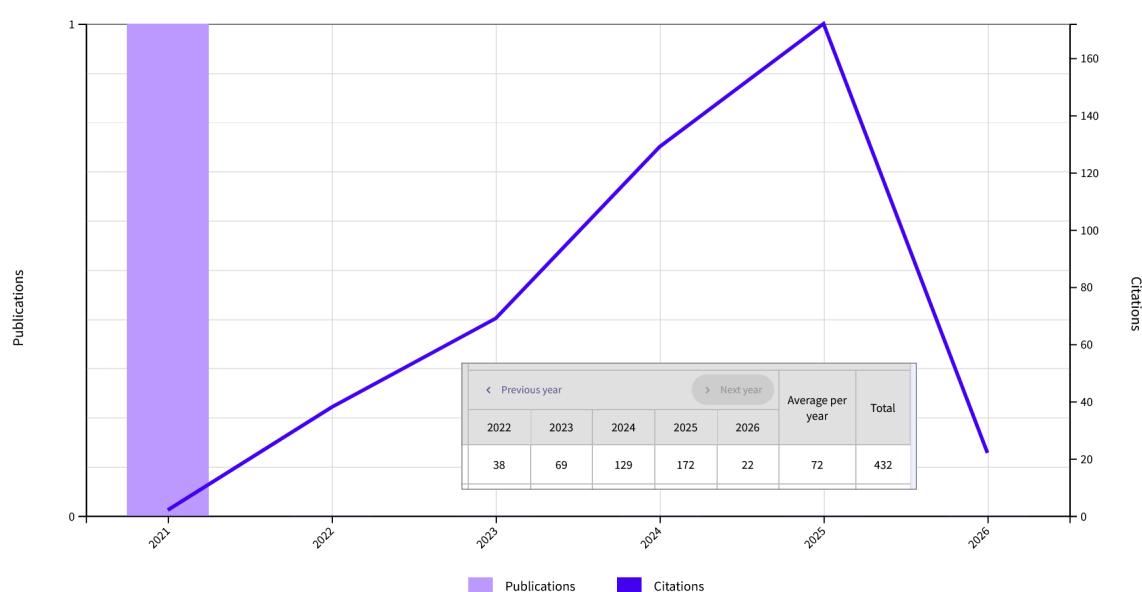
Covaci, C., Gontean, A. Piezoelectric Energy Harvesting Solutions: A Review, *SENSORS*, Volume: 20, Issue: 12, Article Number: 3512, PubMed ID: 32575888, eISSN: 1424-8220, 2020;
Times Cited in Web of Science Core Collection: 485

Abstract: The goal of this paper is to review current methods of energy harvesting, while focusing on piezoelectric energy harvesting. The piezoelectric energy harvesting technique is based on the materials' property of generating an electric field when a mechanical force is applied. This phenomenon is known as the direct piezoelectric effect. Piezoelectric transducers can be of different shapes and materials, making them suitable for a multitude of applications. To optimize the use of piezoelectric devices in applications, a model is needed to

observe the behavior in the time and frequency domain. In addition to different aspects of piezoelectric modeling, this paper also presents several circuits used to maximize the energy harvested.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Chemistry** based on a highly cited threshold for the field and publication year.



5

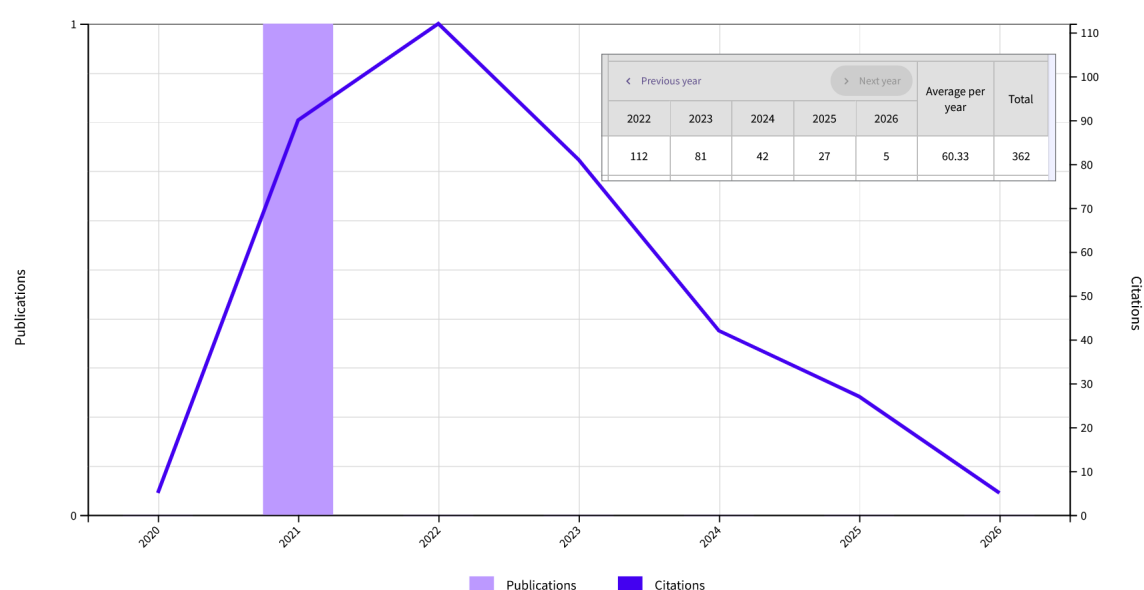
Ardean, C., Davidescu, C.M., Nemes, N.S., Negrea, A., Ciopec, M., Duteanu, N., Negrea, P., Duda-Seiman, D., Musta, V. Factors Influencing the Antibacterial Activity of Chitosan and Chitosan Modified by Functionalization, INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES, Volume: 22, Issue: 14, Article Number: 7449, PubMed ID: 34299068, eISSN: 1422-0067, 2021;
Times Cited in Web of Science Core Collection: 432

Abstract: The biomedical and therapeutic importance of chitosan and chitosan derivatives is the subject of interdisciplinary research. In this analysis, we intended to consolidate some of the recent discoveries regarding the potential of chitosan and its derivatives to be used for biomedical and other purposes. Why chitosan? Because chitosan is a natural biopolymer that can be obtained from one of the most abundant polysaccharides in nature, which is chitin. Compared to other biopolymers, chitosan presents some advantages, such as accessibility, biocompatibility, biodegradability, and no toxicity, expressing significant antibacterial potential. In addition, through chemical processes, a high number of chitosan derivatives can be

obtained with many possibilities for use. The presence of several types of functional groups in the structure of the polymer and the fact that it has cationic properties are determinant for the increased reactive properties of chitosan. We analyzed the intrinsic properties of chitosan in relation to its source: the molecular mass, the degree of deacetylation, and polymerization. We also studied the most important extrinsic factors responsible for different properties of chitosan, such as the type of bacteria on which chitosan is active. In addition, some chitosan derivatives obtained by functionalization and some complexes formed by chitosan with various metallic ions were studied (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Economics & Business** based on a highly cited threshold for the field and publication year.



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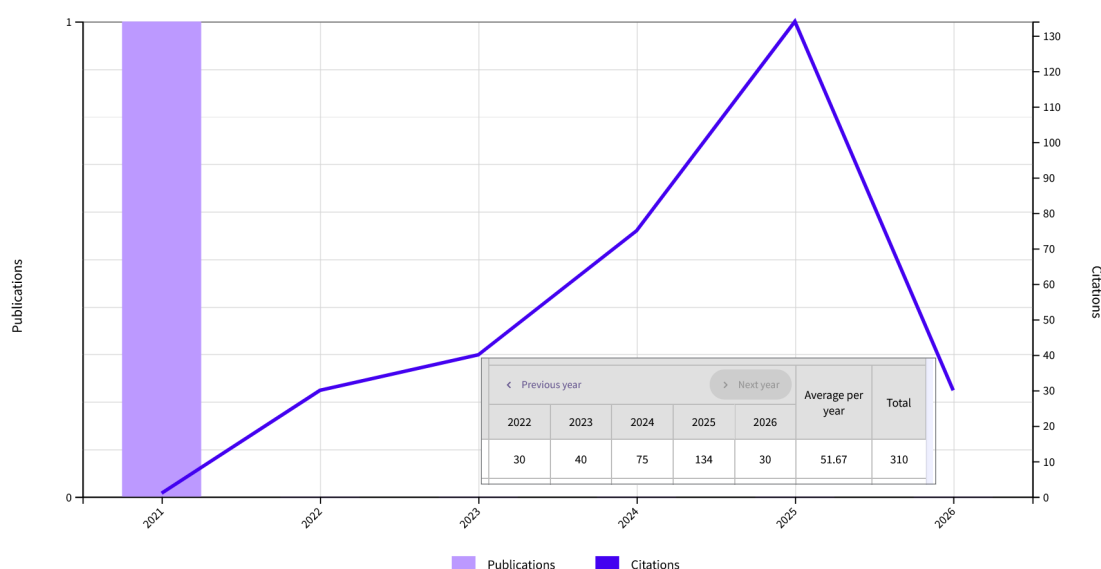
Albulescu, C.T. COVID-19 and the United States financial markets' volatility, *FINANCE RESEARCH LETTERS*, Volume: 38, Article Number: 101699, PubMed ID: 32837380, ISSN: 1544-6123, eISSN: 1544-6131, 2021; Times Cited in Web of Science Core Collection: 362

Abstract: We empirically investigate the effect of the official announcements regarding the COVID-19 new cases of infection and fatality ratio, on the financial markets volatility in the United States (US). We consider both COVID-19 global and US figures and show that the sanitary crisis enhances the S&P 500 realized volatility. Our findings are robust to different model specifications and suggest that

the prolongation of the coronavirus pandemic is an important source of financial volatility, challenging the risk management activity.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Chemistry** based on a highly cited threshold for the field and publication year.



7

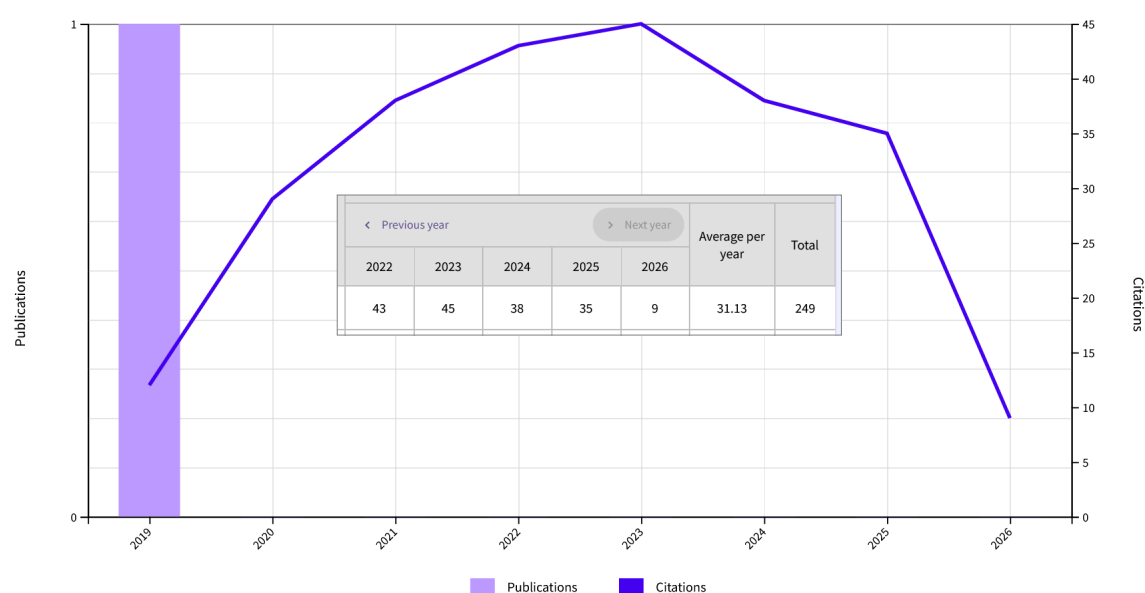
Rajak, D.K.; Wagh, P.H.; Linul, E. Manufacturing Technologies of Carbon/Glass Fiber Reinforced Polymer Composites and Their Properties: A Review, POLYMERS, Volume: 13, Issue: 21, Article Number: 3721, PubMed ID: 34771276, eISSN: 20734360, 2021; Times Cited in Web of Science Core Collection: 310

Abstract: Over the last few years, there has been a growing interest in the study of lightweight composite materials. Due to their tailorable properties and unique characteristics (high strength, flexibility and stiffness), glass (GFs) and carbon (CFs) fibers are widely used in the production of advanced polymer matrix composites. Glass Fiber-Reinforced Polymer (GFRP) and Carbon Fiber-Reinforced Polymer (CFRP) composites have been developed by different fabrication methods and are extensively used for diverse engineering applications. A considerable amount of research papers have been published on GFRP and CFRP composites, but most of them focused on particular aspects.

Therefore, in this review paper, a detailed classification of the existing types of GFs and CFs, highlighting their basic properties, is presented. Further, the oldest to the newest manufacturing techniques of GFRP and CFRP composites have been collected and described in detail. Furthermore, advantages, limitations and future trends of manufacturing methodologies are emphasized. The main properties (mechanical, vibrational, environmental, tribological and thermal) of GFRP and CFRP composites were summarized and documented with results from the literature. Finally, applications and future research directions of FRP composites are addressed (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



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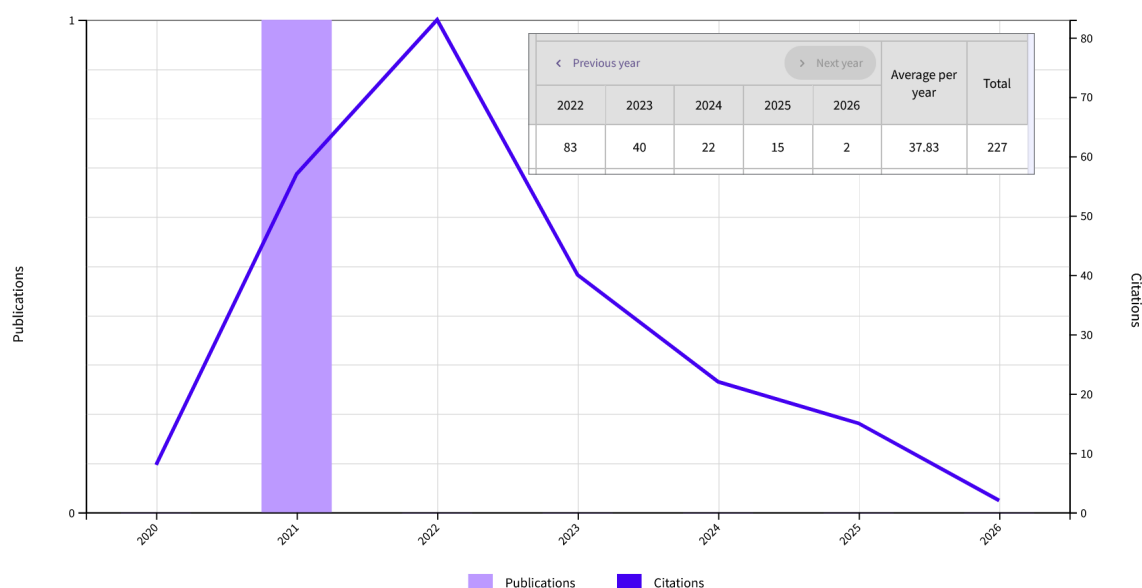
Sarbu, I., Dorca, A. Review on heat transfer analysis in thermal energy storage using latent heat storage systems and phase change materials, INTERNATIONAL JOURNAL OF ENERGY RESEARCH, Volume: 43, Issue: 1, Pages: 29-64, ISSN: 0363-907X, eISSN: 1099-114X, 2019; Times Cited in Web of Science Core Collection: 249

Abstract: Thermal energy storage (TES) is a technology that stocks thermal energy by heating or cooling a storage medium so that the stored energy can be used later for heating and cooling applications and for power generation. TES has recently attracted increasing interest to thermal applications such as space and water heating, waste heat utilisation, cooling, and air conditioning. Phase change materials (PCMs) used for the storage of thermal energy as latent heat are special types of advanced materials that substantially contribute to the efficient use and conservation of waste heat and solar energy. This paper provides a comprehensive review on the development of latent heat storage (LHS) systems focused on heat transfer and enhancement techniques employed in PCMs to effectively charge and discharge

latent heat energy, and the formulation of the phase change problem. The main categories of PCMs are classified and briefly described, and heat transfer enhancement technologies, namely dispersion of low-density materials, use of porous materials, metal matrices and encapsulation, incorporation of extended surfaces and fins, utilisation of heat pipes, cascaded storage, and direct heat transfer techniques, are also discussed in detail. Additionally, a two-dimensional heat transfer simulation model of an LHS system is developed using the control volume technique to solve the phase change problem. Furthermore, a three-dimensional numerical simulation model of an LHS is built to investigate the quasi-steady state and transient heat transfer in PCMs. Finally, several future research directions are provided.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



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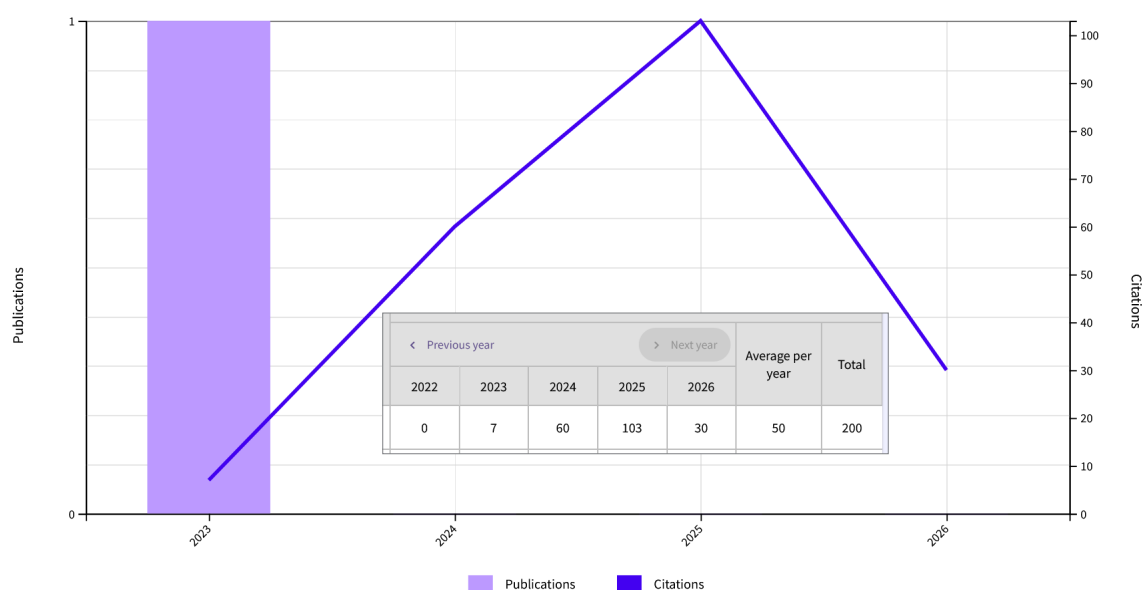
Roman, R.C., Precup, R.E., Petriu, E.M. Hybrid data-driven fuzzy active disturbance rejection control for tower crane systems, EUROPEAN JOURNAL OF CONTROL, Volume: 58, Pages: 373-387, ISSN: 0947-3580, eISSN: 1435-5671, 2021;
Times Cited in Web of Science Core Collection: 227

Abstract: This paper proposes the Virtual Reference Feedback Tuning (VRFT) of a combination of two control algorithms, Active Disturbance Rejection Control (ADRC) as a representative data-driven (or model-free) control algorithm and fuzzy control, in order to exploit the advantages of data-driven control and fuzzy control. The combination of Active Disturbance Rejection Control with Proportional-Derivative Takagi-Sugeno Fuzzy Control (PDTSC) tuned by Virtual Reference Feedback Tuning results in two novel data-driven algorithms referred to as hybrid data-driven fuzzy ADRC algorithms. The main benefit of this combination is the automatic optimal tuning in a model-free manner of the parameters of the combination of Active Disturbance Rejection Control with Proportional-Derivative Takagi-Sugeno Fuzzy Control called ADRC-PDTSC. The second benefit is that the suggested

combination is time saving in finding the optimal parameters of the controllers. However, since Virtual Reference Feedback Tuning generally works with linear controllers to solve a certain optimization problem and the fuzzy controllers are essentially non-linear, this paper replaces the least-squares algorithm specific to Virtual Reference Feedback Tuning with a metaheuristic optimization algorithm, i.e. Grey Wolf Optimizer. The fuzzy control system stability is guaranteed by including a limit cycle-based stability analysis approach in Grey Wolf Optimizer algorithm to validate the next solution candidates. The hybrid data-driven fuzzy ADRC algorithms are validated as controllers in terms of real-time experiments conducted on three-degree-of-freedom tower crane system laboratory equipment (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Plant & Animal Science** based on a highly cited threshold for the field and publication year.



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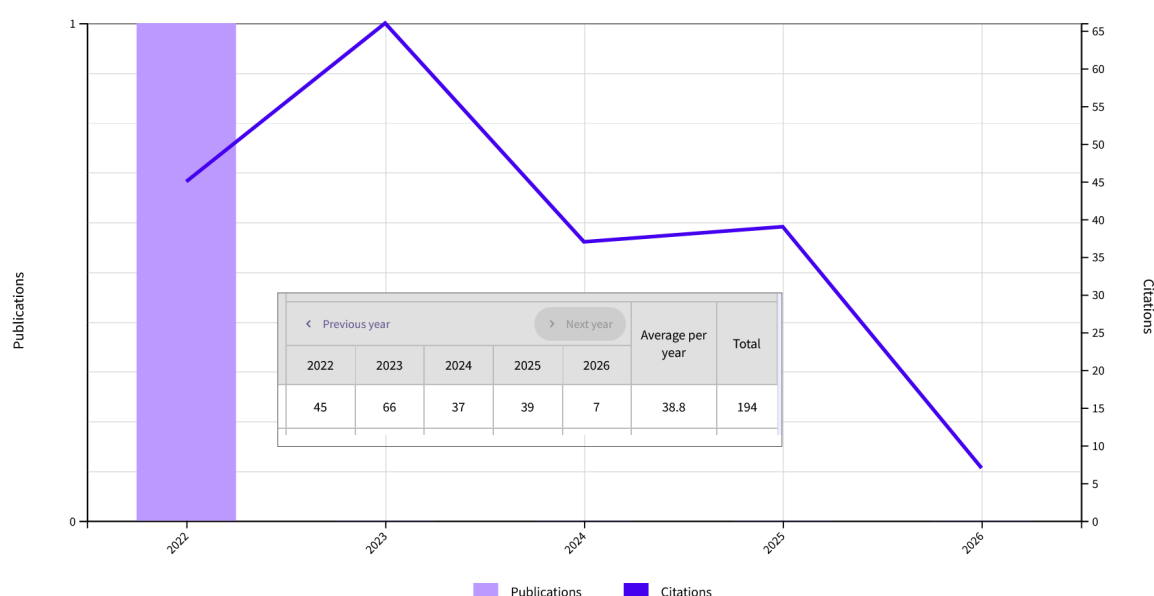
Liga, S., Paul, C., Péter, F. Flavonoids: Overview of Biosynthesis, Biological Activity, and Current Extraction Techniques, PLANTS-BASEL, Volume: 12, Issue: 14, Article Number: 2732, PubMed ID: 37514347, ISSN: 2223-7747, 2023;
Times Cited in Web of Science Core Collection: 200

Abstract: Recently, increased attention has been paid to natural sources as raw materials for the development of new added-value products. Flavonoids are a large family of polyphenols which include several classes based on their basic structure: flavanones, flavones, isoflavones, flavonols, flavanols, and anthocyanins. They have a multitude of biological properties, such as anti-inflammatory, antioxidant, antiviral, antimicrobial, anticancer, cardioprotective, and neuroprotective effects.

Current trends of research and development on flavonoids relate to identification, extraction, isolation, physico-chemical characterization, and their applications to health benefits. This review presents an up-to-date survey of the most recent developments in the natural flavonoid classes, the biological activity of representative flavonoids, current extraction techniques, and perspectives.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



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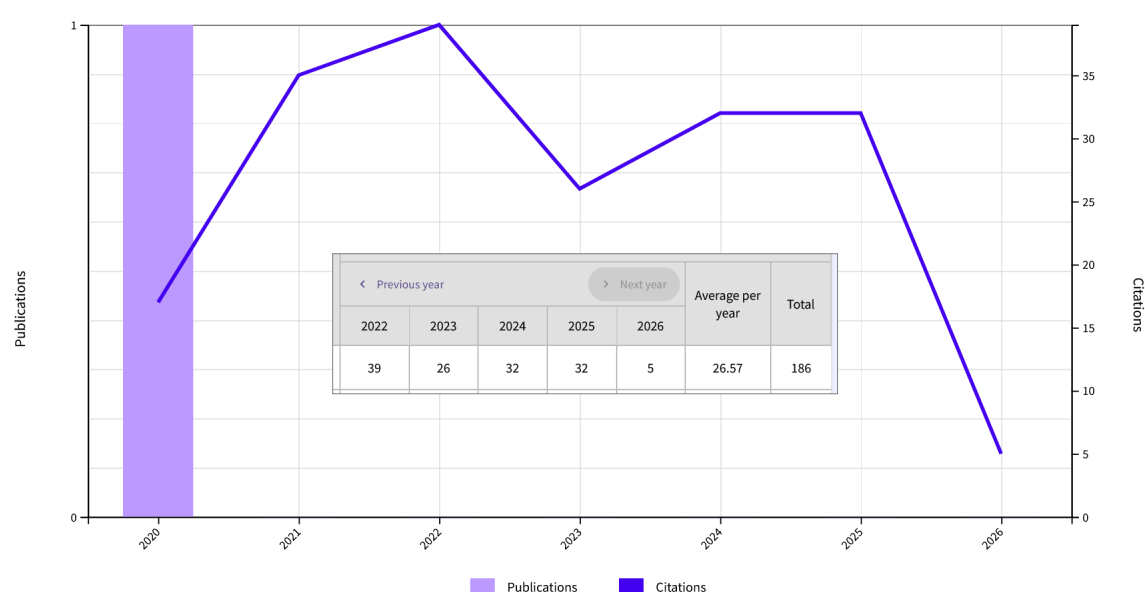
Pozna, C., Precup, R.E., Horvath, E., Petriu, E.M. Hybrid Particle Filter-Particle Swarm Optimization Algorithm and Application to Fuzzy Controlled Servo Systems, IEEE TRANSACTIONS ON FUZZY SYSTEMS, Volume: 30, Issue: 10, Pages: 4286-4297, ISSN: 1063-6706, eISSN: 1941-0034, 2022; Times Cited in Web of Science Core Collection: 194

Abstract: This article presents a hybrid metaheuristic optimization algorithm that combines particle filter (PF) and particle swarm optimization (PSO) algorithms. The new PF-PSO algorithm consists of two steps: the first generates randomly the particle population; and the second zooms the search domain. An application of this algorithm to the optimal tuning of proportional-integral-fuzzy controllers for the position control of a family of integral-type servo systems is then presented as a second contribution.

The reduction in PF-PSO algorithm's cost function allows for reduced energy consumption of the fuzzy control system. A comparison with other metaheuristic algorithms on canonical test functions and experimental results are presented at the end of this article.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Geosciences** based on a highly cited threshold for the field and publication year.



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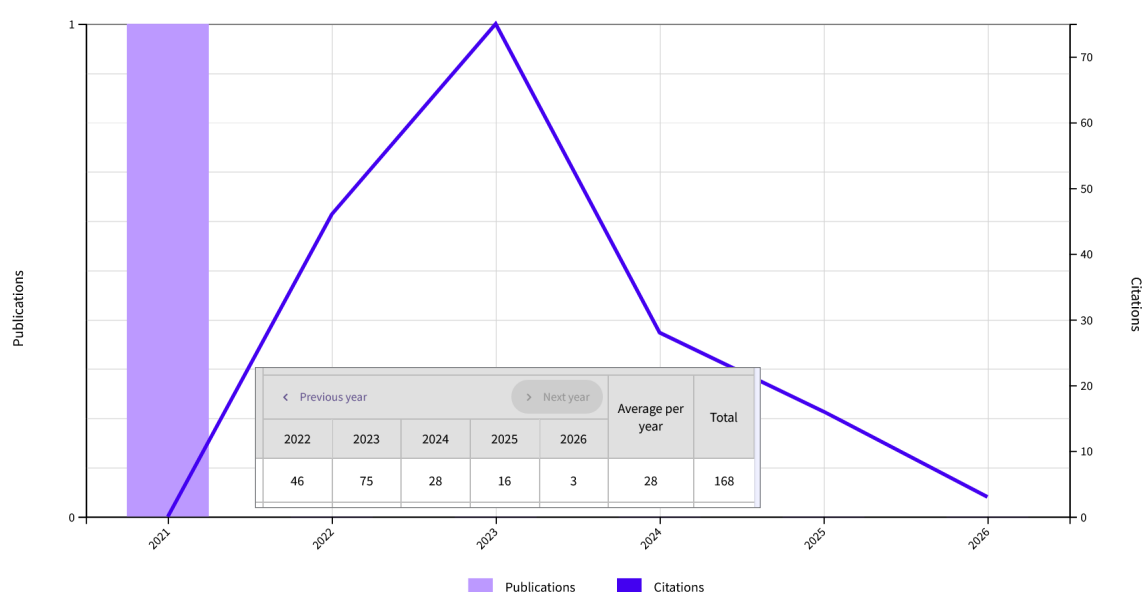
Tmusic, G., Manfreda, S., Aasen, H., James, M.R., Goncalves, G., Ben-Dor, E., Brook, A., Polinova, M., Arranz, J.J., Meszaros, J., Zhuang, R.D., Johansen, K., Malbeteau, Y., de Lima, I.P., Davids, C., Herban, S., McCabe, M.F. Current Practices in UAS-based Environmental Monitoring, REMOTE SENSING, Volume: 12, Issue: 6, Article Number: 1001, eISSN: 2072-4292, 2020;
Times Cited in Web of Science Core Collection: 186

Abstract: With the increasing role that unmanned aerial systems (UAS) are playing in data collection for environmental studies, two key challenges relate to harmonizing and providing standardized guidance for data collection, and also establishing protocols that are applicable across a broad range of environments and conditions. In this context, a network of scientists are cooperating within the framework of the Harmonious Project to develop and promote harmonized mapping strategies and disseminate operational guidance to ensure best practice for data collection and interpretation. The culmination of these efforts is summarized in the present manuscript.

Through this synthesis study, we identify the many interdependencies of each step in the collection and processing chain, and outline approaches to formalize and ensure a successful workflow and product development. Given the number of environmental conditions, constraints, and variables that could possibly be explored from UAS platforms, it is impractical to provide protocols that can be applied universally under all scenarios. However, it is possible to collate and systematically order the fragmented knowledge on UAS collection and analysis to identify the best practices that can best ensure the streamlined and rigorous development of scientific products.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Computer Science** based on a highly cited threshold for the field and publication year.



13

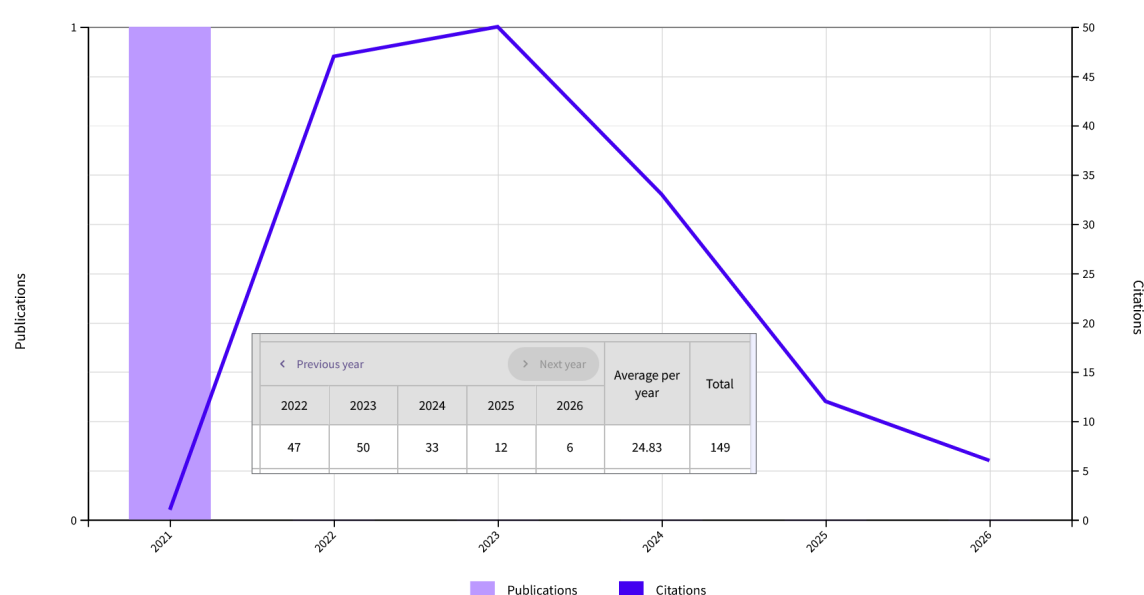
Zamfirache, I.A., Precup, R.E., Roman, R.C., Petriu, E.M. Policy Iteration Reinforcement Learning-based control using a Grey Wolf Optimizer algorithm, INFORMATION SCIENCES, Volume: 585, Pages: 162-175, ISSN: 0020-0255, eISSN: 1872-6291, 2021; Times Cited in Web of Science Core Collection: 168

Abstract: This paper presents a new Reinforcement Learning (RL)-based control approach that uses the Policy Iteration (PI) and a metaheuristic Grey Wolf Optimizer (GWO) algorithm to train the Neural Networks (NNs). Due to an efficient tradeoff to exploration and exploitation, the GWO algorithm shows good results in NN training and solving complex optimization problems. The proposed approach is compared to the classical PI RL-based control approach using the Gradient Descent (GD) algorithm, and with the RL-based control approach which uses the metaheuristic Particle Swarm Optimization (PSO) algorithm. The experiments are conducted using a nonlinear servo system laboratory equipment. Each approach evaluated on

how well it solves the optimal reference tracking control for an experimental servo system position control system. The policy NNs specific to all three approaches are implemented as state feedback with integrator controllers to remove the steady-state control errors and thus ensure the convergence of the objective function. Because of the random nature of metaheuristic algorithms, the experiments for GWO and PSO algorithms are run multiple times and the results are averaged before the conclusions are presented. The experimental results shows that for the control objective considered in this paper, the GWO algorithm represents a better solution compared to GD and PSO algorithms.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/June 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Computer Science** based on a highly cited threshold for the field and publication year.



14

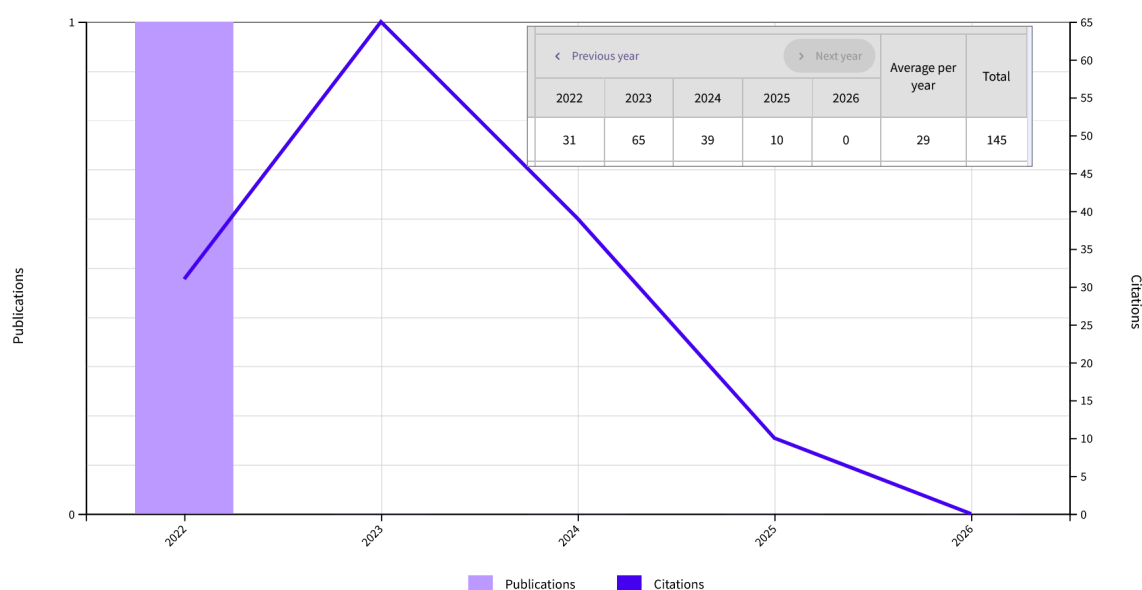
Zamfirache, I.A., Precup, R.E., Roman, R.C., Petriu, E.M. Reinforcement Learning-based control using Q-learning and gravitational search algorithm with experimental validation on a nonlinear servo system, INFORMATION SCIENCES, Volume: 583, Pages: 99-120, ISSN: 0020-0255, eISSN: 1872-6291, 2021;
Times Cited in Web of Science Core Collection: 149

Abstract: This paper presents a novel Reinforcement Learning (RL)-based control approach that uses a combination of a Deep Q-Learning (DQL) algorithm and a metaheuristic Gravitational Search Algorithm (GSA). The GSA is employed to initialize the weights and the biases of the Neural Network (NN) involved in DQL in order to avoid the instability, which is the main drawback of the traditional randomly initialized NNs. The quality of a particular set of weights and biases is measured at each iteration of the GSA-based initialization using a fitness function aiming to achieve the predefined optimal control or learning objective.

The data generated during the RL process is used in training a NN-based controller that will be able to autonomously achieve the optimal reference tracking control objective. The proposed approach is compared with other similar techniques which use different algorithms in the initialization step, namely the traditional random algorithm, the Grey Wolf Optimizer algorithm, and the Particle Swarm Optimization algorithm. The NN-based controllers based on each of these techniques are compared using performance indices specific to optimal control as settling time, rise time, peak time, overshoot, and minimum cost function value (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Psychiatry/ Psychology** based on a highly cited threshold for the field and publication year.



15

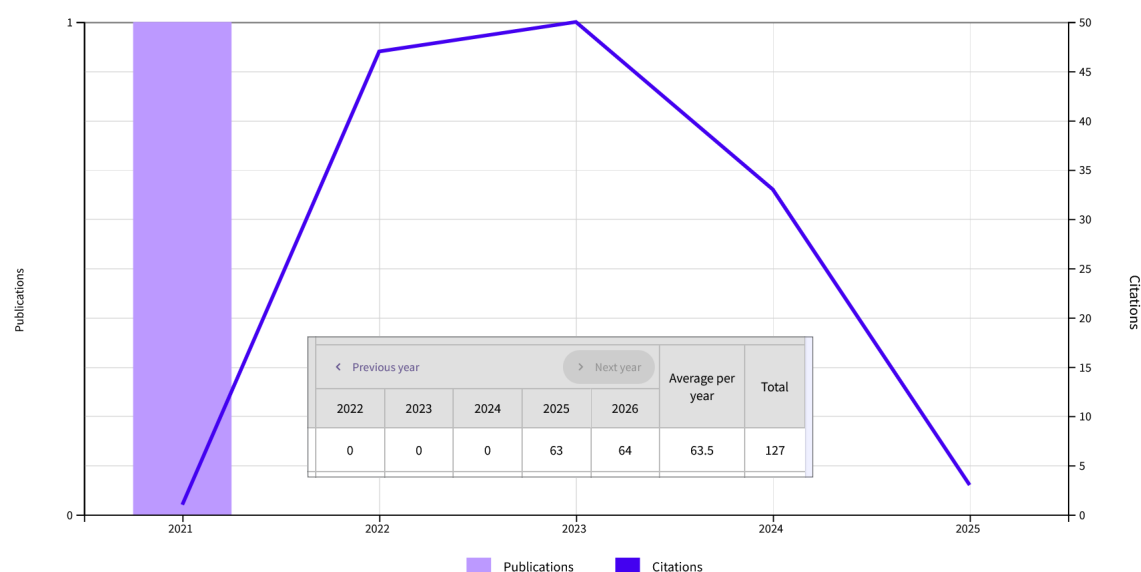
Yu, S.B., Abbas, J., Draghici, A., Negulescu, O.H., Ain, N.U. Social Media Application as a New Paradigm for Business Communication: The Role of COVID-19 Knowledge, Social Distancing, and Preventive Attitudes, *FRONTIERS IN PSYCHOLOGY*, Volume: 13, Article Number: 903082, PubMed ID: 35664180, ISSN: 1664-1078, 2022;
Times Cited in Web of Science Core Collection: 145

Abstract: Business firms and the public have encountered massive consequences of the COVID-19 pandemic. This pandemic has become the most significant challenge and influenced all communities. This research study focuses on exploring the relationship between COVID-19 knowledge, social distancing, individuals' attitudes toward social media use, and practices of using social media amid the COVID-19 crisis. This study examines how attitudes toward social media use mediate the linkage between COVID-19 knowledge, social distancing, and practices for social media use. This survey uses a non-probability convenience sampling approach to collect samples and recruit willing respondents with their consent for data collection.

This study recorded the feedback from 348 participants who encountered the indirect/direct effects of nationwide lockdowns, restrictions on social gatherings, and COVID-19 infection. The findings validate the proposed hypotheses for their direct effects and indicate significant beta-values, t-statistics, and the p-values at $p < 0.001$. The results validate a relationship between the COVID-19 knowledge of and social distancing practices. Similarly, the results approved a positive link between social distancing and attitudes toward social media use amid COVID-19. The findings validate the relation between social distancing and attitudes toward social media use during COVID-19 challenges (beta-value = 0.22 and t-statistics = 3.078) (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of September/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Space Science** based on a highly cited threshold for the field and publication year.



16

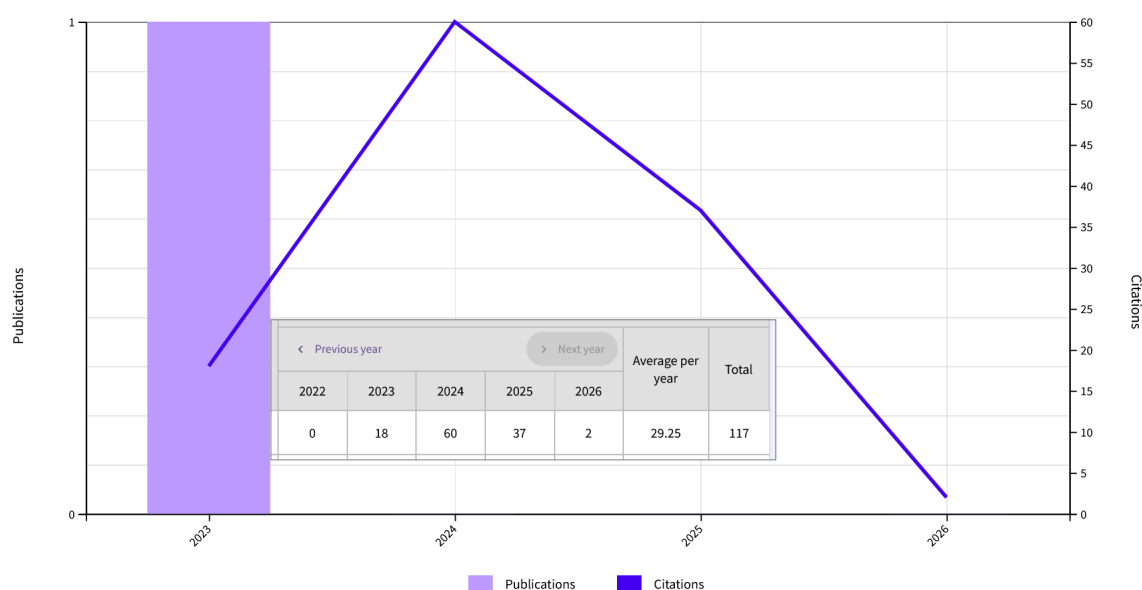
Di Valentino, E., Said, J. L., (. . .) Pop, N. (Pop, Nicolina), (. . .) Piao, Y.-S., Davari, Z. The CosmoVerse White Paper: Addressing observational tensions in cosmology with systematics and fundamental physics, PHYSICS OF THE DARK UNIVERSE, Volume: 49, Article Number: 101965, 2025; Times Cited in Web of Science Core Collection: 127

Abstract: The standard model of cosmology has provided a good phenomenological description of a wide range of observations both at astrophysical and cosmological scales for several decades. This concordance model is constructed by a universal cosmological constant and supported by a matter sector described by the standard model of particle physics and a cold dark matter contribution, as well as very early-time inflationary physics, and underpinned by gravitation through general relativity. There have always been open questions about the soundness of the foundations of the standard model. However, recent years have shown that there may also be questions from the observational sector with the emergence of differences between certain cosmological probes. In this White Paper, we identify

the key objectives that need to be addressed over the coming decade together with the core science projects that aim to meet these challenges. These discordances primarily rest on the divergence in the measurement of core cosmological parameters with varying levels of statistical confidence. These possible statistical tensions may be partially accounted for by systematics in various measurements or cosmological probes but there is also a growing indication of potential new physics beyond the standard model. After reviewing the principal probes used in the measurement of cosmological parameters, as well as potential systematics, we discuss the most promising array of potential new physics that may be observable in upcoming surveys (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



17

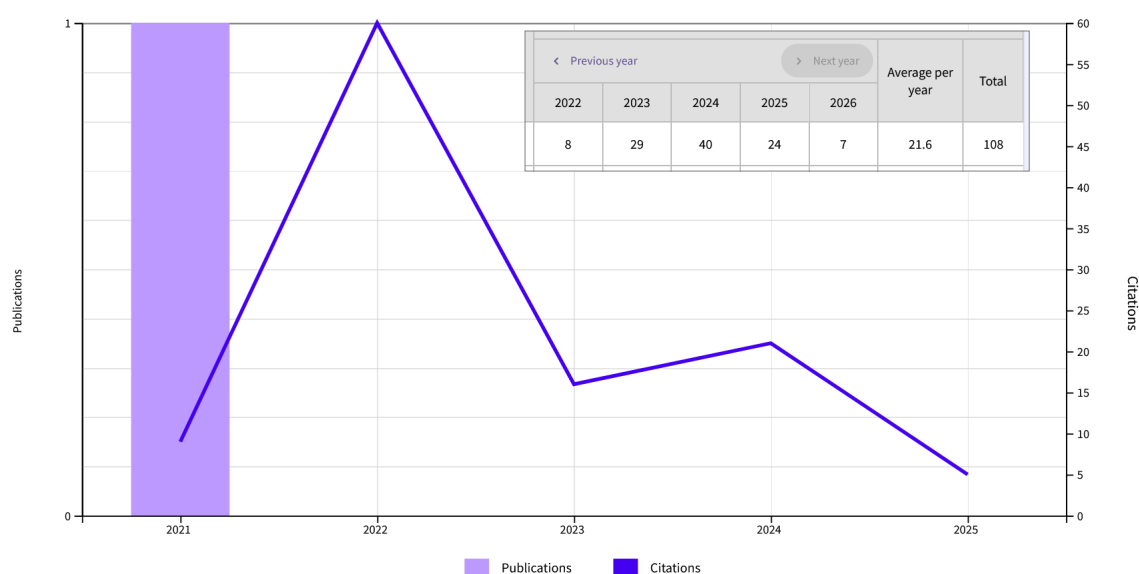
Zamfirache, I.A., Precup, R.E., Roman, R.C., Petriu, E.M. Neural Network-based control using Actor-Critic Reinforcement Learning and Grey Wolf Optimizer with experimental servo system validation, *EXPERT SYSTEMS WITH APPLICATIONS*, Volume: 225, Article Number: 120112, ISSN: 0957-4174, eISSN: 1873-6793, 2023;
Times Cited in Web of Science Core Collection: 117

Abstract: This paper introduces a novel reference tracking control approach implemented using a combination of the Actor-Critic Reinforcement Learning (RL) framework and the Grey Wolf Optimizer (GWO) algorithm. The classical neural network (NN)-based implementation of the Critic, optimized with the Gradient Descent (GD) algorithm, is replaced with the GWO algorithm, aiming to eliminate the main drawbacks of the GD algorithm, i. e., slow convergence and the tendency to get stuck in local optimal values. The combined effort from multiple search agents and the random values involved in the search process make the GWO algorithm very efficient in exploring the solution space and finding global optimal solutions. The main objective of the proposed approach is to build a NN-based controller capable of solving an optimal reference tracking control

problem on nonlinear servo system laboratory equipment. The training data needed to build the controller is collected while the actor learns how to control the servo system, using the GWO-based critic to monitor the process and step in to correct the actor when needed. A comparison study is performed across three online RL-based control approaches, namely the novel approach using GWO to implement the Critic in the Actor-Critic RL framework, the traditional approach using NNs with GD for optimization and another approach using a metaheuristic algorithm called Particle Swarm Optimization (PSO). The experimental results illustrate the superiority of the proposed approach over the competing ones.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/ October 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Physics** based on a highly cited threshold for the field and publication year.



18

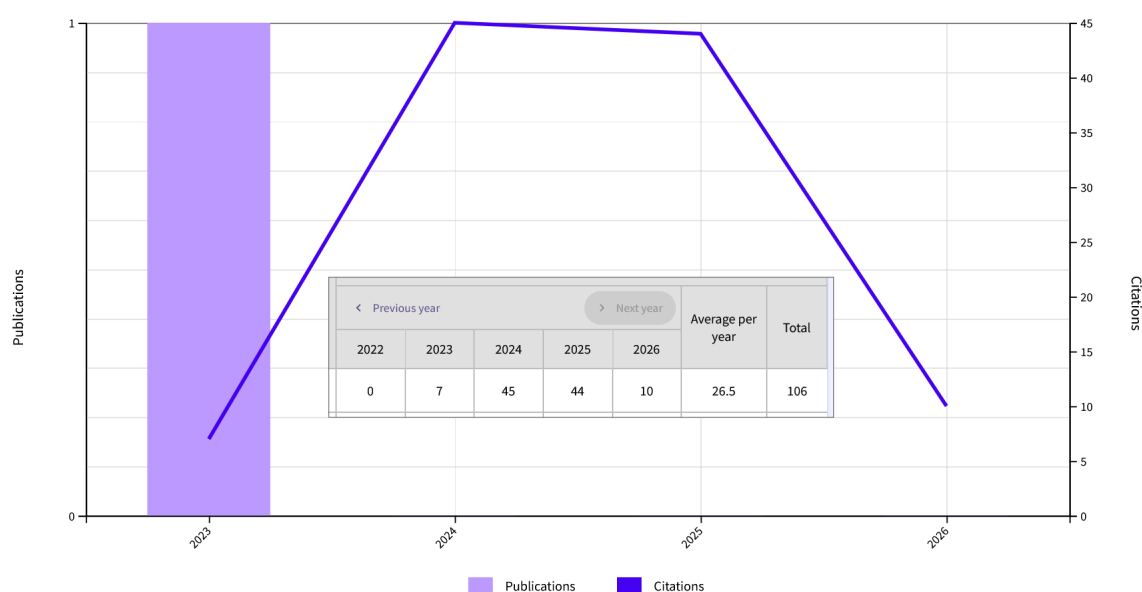
Socoliuc, V., Avdeev, M., Kuncser, V., Turcu, R., Tombácz, E., Vékás, L. Ferrofluids and bio-ferrofluids: looking back and stepping forward, *NANOSCALE*, Volume: 14, Issue: 13, Pages: 4786-4886, PubMed ID: 35297919, ISSN: 2040-3364, eISSN: 2040-3372, 2022;
Times Cited in Web of Science Core Collection: 108

Abstract: Ferrofluids investigated along for about five decades are ultrastable colloidal suspensions of magnetic nanoparticles, which manifest simultaneously fluid and magnetic properties. Their magnetically controllable and tunable feature proved to be from the beginning an extremely fertile ground for a wide range of engineering applications. More recently, biocompatible ferrofluids attracted huge interest and produced a considerable increase of the applicative potential in nanomedicine, biotechnology and environmental protection.

This paper offers a brief overview of the most relevant early results and a comprehensive description of recent achievements in ferrofluid synthesis, advanced characterization, as well as the governing equations of ferrohydrodynamics, the most important interfacial phenomena and the flow properties. Finally, it provides an overview of recent advances in tunable and adaptive multifunctional materials derived from ferrofluids and a detailed presentation of the recent progress of applications in the field of sensors and actuators, ferrofluid-driven assembly and manipulation, droplet technology, including droplet generation and control, mechanical actuation, liquid computing and robotics.

Web of Science - Clarivate Analytics Highly Cited Paper

As of July/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



19

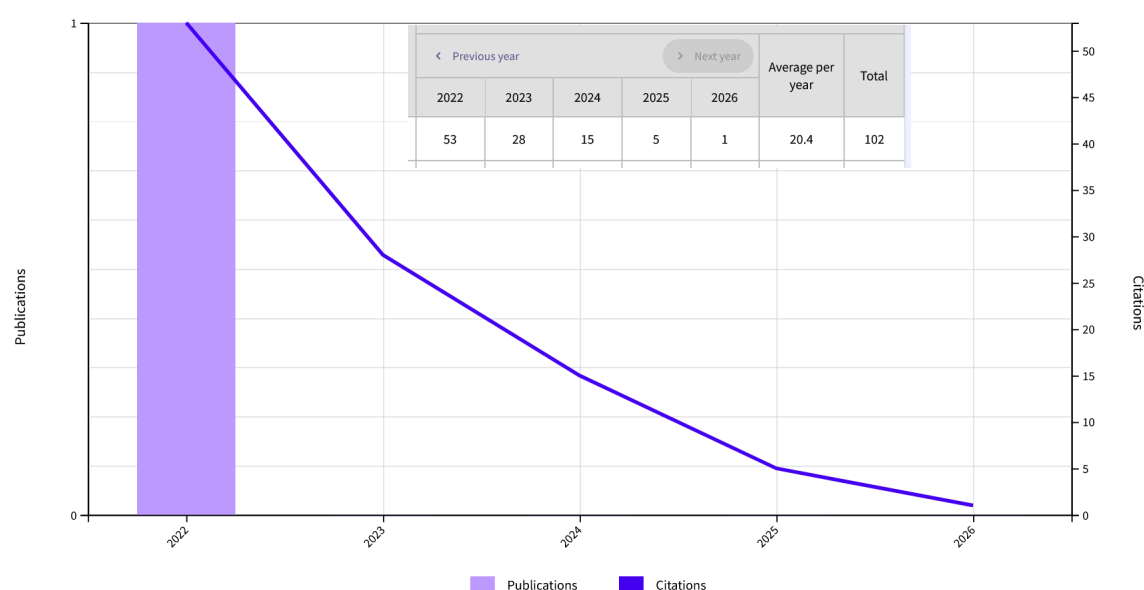
Ali, U.; Ullah, S.; Kamal, B.; Matekovits, L.; Altaf, A. Design, Analysis and Applications of Wearable Antennas: A Review, IEEE ACCESS, Volume: 11, Pages: 14458–14486, ISSN: 21693536, 2023;
Times Cited in Web of Science Core Collection: 106

Abstract: Wearable antennas are the vital components for Body Centric Communication (BCC). These antennas have recently gained the attention of researchers and have received a great deal of popularity due to their attractive characteristics and opportunities. They are fundamental in the Wireless Body Area Networks (WBANs) for health care, military, sports, and identification purposes. Compared to traditional antennas, these antennas work in close proximity to the human body, so their performance in terms of return loss, gain, directivity, bandwidth, radiation pattern, efficiency, and Specific Absorption Rate (SAR) is influenced by the coupling and absorption of the human body tissues. Additionally, in the design of these antennas, size, power consumption, and speed can also play a paramount role. In most cases, these antennas are integrated into the clothes, or in some cases, they may be fixed over the skin of the users.

When these characteristics are considered, the design of wearable antennas becomes challenging, particularly when textile materials are examined, high conductivity materials are used during the manufacturing process, and various deformation scenarios have an impact on the design's performance. To enhance the overall performance of the wearable antennas and to reduce the backward radiation towards the human body, metamaterial surfaces are introduced that provide a high degree of isolation from the human body and significantly reduce the SAR. This paper discusses the state-of-the-art wearable/textile/flexible antennas integrated with metamaterial structures composed of wearable/flexible substrate materials, with a focus on single and dual band antenna designs (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Psychiatry/ Psychology** based on a highly cited threshold for the field and publication year.



20

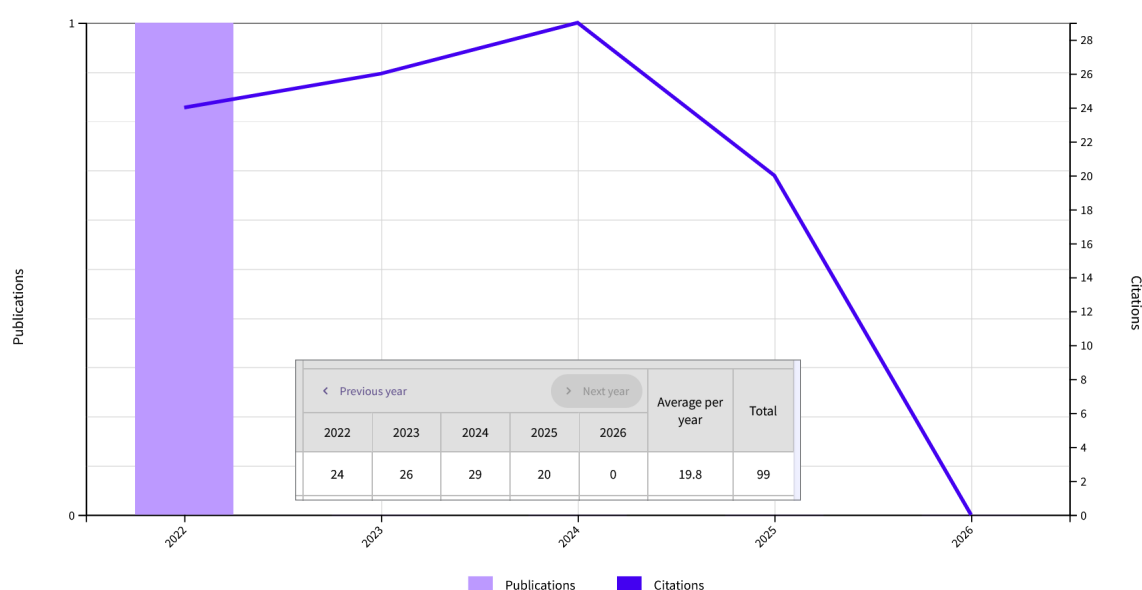
Zhou, Y.Y., Draghici, A., Abbas, J., Mubeen, R., Boatca, M.E., Salam, M.A. Social Media Efficacy in Crisis Management: Effectiveness of Non-pharmaceutical Interventions to Manage COVID-19 Challenges, *FRONTIERS IN PSYCHIATRY*, Volume: 12, Article Number: 626134, PubMed ID: 35197870, ISSN: 1664-0640, 2022;
Times Cited in Web of Science Core Collection: 102

Abstract: The new identified virus COVID-19 has become one of the most contagious diseases in human history. The ongoing coronavirus has created severe threats to global mental health, which have resulted in crisis management challenges and international concerns related to health issues. As of September 9, 2021, there were over 223.4 million patients with COVID-19, including 4.6 million deaths and over 200 million recovered patients reported worldwide, which has made the COVID-19 outbreak one of the deadliest pandemics in human history. The aggressive public health implementations endorsed various precautionary safety and preventive strategies to suppress and minimize COVID-19 disease transmission. The second, third, and fourth waves of COVID-19 continue to pose global challenges to crisis management, as its evolution and implications are still unfolding.

This study posits that examining the strategic ripostes and pandemic experiences sheds light on combatting this global emergency. This study recommends two model strategies that help reduce the adverse effects of the pandemic on the immune systems of the general population. This present paper recommends NPI interventions (non-pharmaceutical intervention) to combine various measures, such as the suppression strategy (lockdown and restrictions) and mitigation model to decrease the burden on health systems. The current COVID-19 health crisis has influenced all vital economic sectors and developed crisis management problems. The global supply of vaccines is still not sufficient to manage this global health emergency. In this crisis, NPIs are helpful to manage the spillover impacts of the pandemic. activities and resolve healthcare issues...

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/August 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



21

Dar, A.A., Hameed, J., Huo, C.H., Sarfraz, M., Albasher, G., Wang, C.Y., Nawaz, A. Recent optimization and panelizing measures for green energy projects; insights into CO₂ emission influencing to circular economy, FUEL, Volume: 314, Article Number: 123094, ISSN: 0016-2361, eISSN: 1873-7153, 2022;

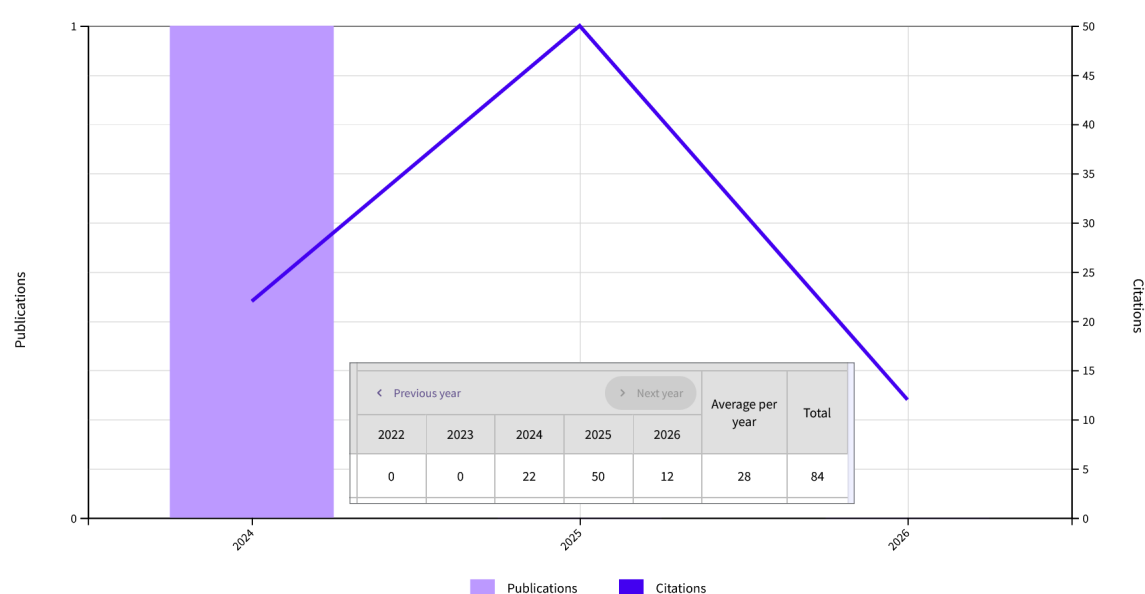
Times Cited in Web of Science Core Collection: 99

Abstract: Green energy projects (including wind, solar, biomass, hydro projects) are the major constituents of biofuel projects and primary need of global world which are directly concerned with economic growth and gross domestic products (GDP) development. In last few decades, fossil fuel consumption and carbon dioxide (CO₂) emission have been increased due to more economic growth and growing population. Moreover, the objective of this research is to assess the consequence of biofuel including natural gas, environmentally friendly power projects (renewable-energy), and thermal power utilization on financial turn of events including GDP and CO₂ in ten top countries.

Multivariate climate countries with ubiquitous CO₂ emission during the period of 1990–2018 were selected to examine the long-run flexibility as well as the path of causality between different variables, the panel co-integration test, panel heterogenous Dumitrescu and Hurlin causality evaluation and panel completely modified ordinary least squares were employed. The panel co-reconciliation test verify that variables have a long-run equilibrium correlation in their relationships Long haul versatility and causality tests show that natural gas doesn't add to financial development or CO₂ decreases (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Pharmacology & Toxicology** based on a highly cited threshold for the field and publication year.



22

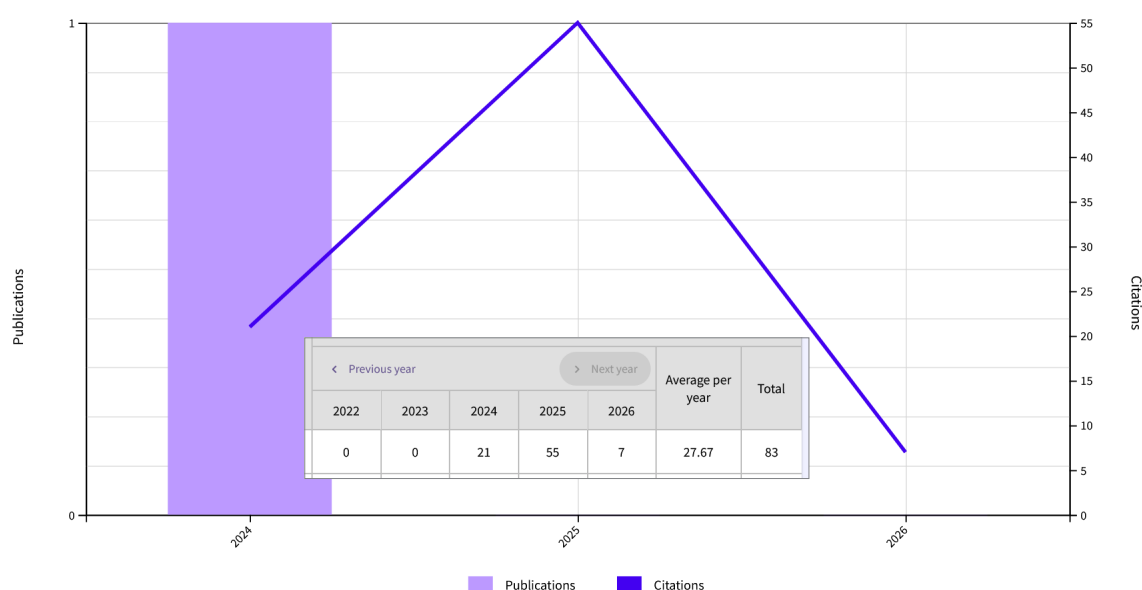
Liga, S., Paul, C., Moaca, E.A., Péter, F. Niosomes: Composition, Formulation Techniques, and Recent Progress as Delivery Systems in Cancer Therapy, PHARMACEUTICS, Volume: 16, Issue: 2, Article Number: 223, PubMed ID: 38399277, eISSN: 1999-4923, 2024;
Times Cited in Web of Science Core Collection: 84

Abstract: Niosomes are vesicular nanocarriers, biodegradable, relatively non-toxic, stable, and inexpensive, that provide an alternative for lipid-solid carriers (e.g., liposomes). Niosomes may resolve issues related to the instability, fast degradation, bioavailability, and insolubility of different drugs or natural compounds.

Niosomes can be very efficient potential systems for the specific delivery of anticancer, antioxidant, anti-inflammatory, antimicrobial, and antibacterial molecules. This review aims to present an overview of their composition, the most common formulation techniques, as well as of recent utilizations as delivery systems in cancer therapy.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Computer Science** based on a highly cited threshold for the field and publication year.



23

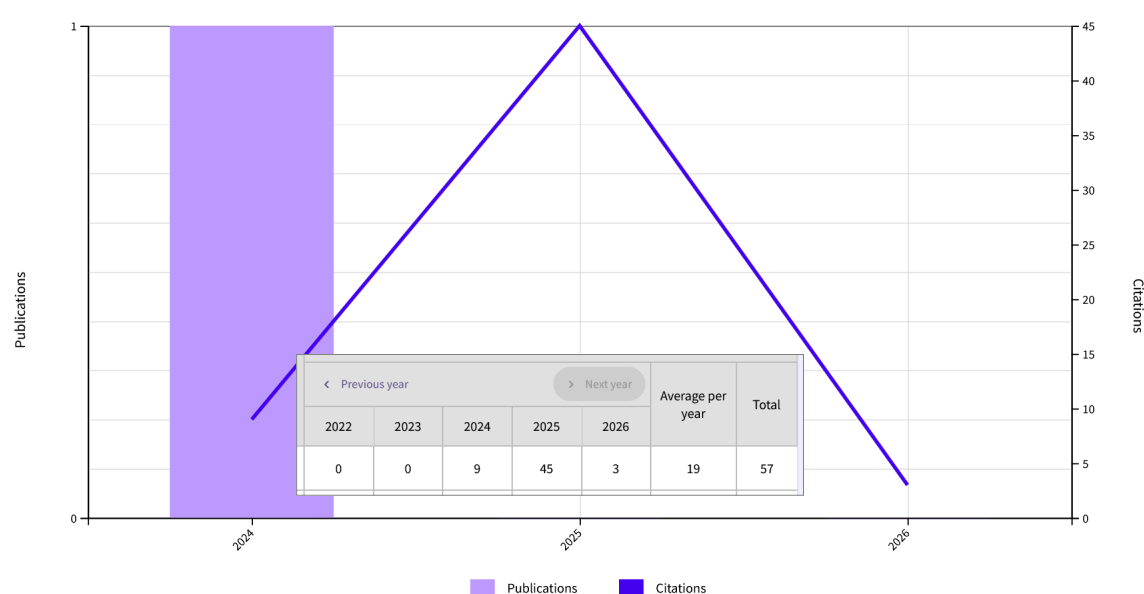
Roman, R.C., Precup, R.E., Petriu, E.M., Borlea, A.I. Hybrid Data-Driven Active Disturbance Rejection Sliding Mode Control with Tower Crane Systems Validation, ROMANIAN JOURNAL OF INFORMATION SCIENCE AND TECHNOLOGY, Volume: 27, Issue: 1, Pages: 50-64, ISSN: 1453-8245, 2024; Times Cited in Web of Science Core Collection: 83

Abstract: This paper proposes a combination of a data-driven algorithm represented by continuous-time Active Disturbance Rejection Control (ADRC) and a Sliding Mode Control (SMC) algorithm. The purpose of this hybrid controller referred to as ADRC-SMC is to improve the overall control-loop system performance while guaranteeing its stability. This will be done through clear, simple, and transparent steps of controller design in a novel real formulation focused on practical implementation. The parameters of the novel second-order continuous-time ADRC-SMC algorithm are optimally tuned using a metaheuristic slime mould algorithm.

The purpose of obtaining the parameters of the ADRC-SMC algorithms in this model-based manner is to reduce the heuristics and further ensure a fair performance comparison of the ADRC-SMC algorithm with that of the popular ADRC algorithm. The data-driven second-order continuous-time ADRC and ADRC-SMC algorithms are validated experimentally validated on tower crane laboratory equipment.

Web of Science - Clarivate Analytics Highly Cited Paper

As of March/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Computer Science** based on a highly cited threshold for the field and publication year.



24

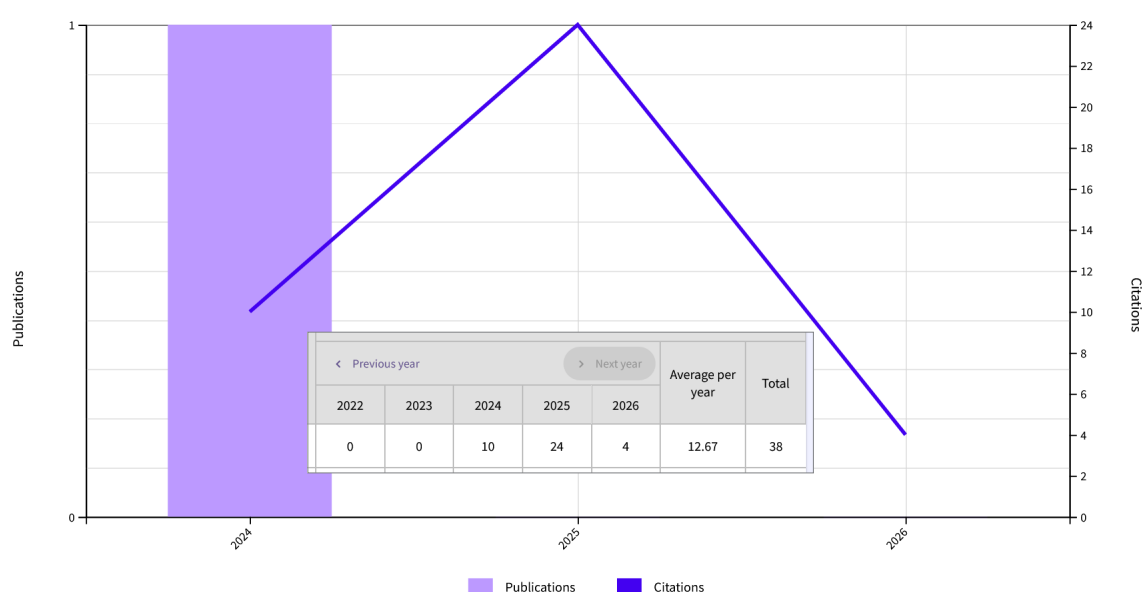
Zamfirache, I.A., Precup, R.E., Petriu, E.M. Adaptive reinforcement learning-based control using proximal policy optimization and slime mould algorithm with experimental tower crane system validation, *APPLIED SOFT COMPUTING*, Volume: 160, Article Number: 111687, ISSN: 1568-4946, eISSN: 1872-9681, 2024;
Times Cited in Web of Science Core Collection: 57

Abstract: This paper presents a novel optimal reference tracking control approach resulted from the combination of a popular policy gradient Reinforcement Learning (RL) algorithm, namely Proximal Policy Optimization (PPO), and a metaheuristic Slime Mould Algorithm (SMA). One of the most important parameters in the PPO-based RL process is the learning rate, which has a big impact on how the parameters of the actor neural network (NN) are iteratively updated. In every episode of the RL process, the weights and the biases of the actor NN are multiplied with the learning rate, determining how much the learning agent will step into a certain direction computed based on previous experiences.

The classical PPO algorithm usually relies on fixed values for the learning rates which rarely change, or not at all, during the learning process. However, its main drawback is that the learning agent cannot take advantage of positive momentum in the learning process by accelerating towards good learning experiences or slow down and quickly change the direction in the case of consecutive negative learning experiences (...)

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/June 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Pharmacology & Toxicology** based on a highly cited threshold for the field and publication year.



25

Danila, A.I., Ghenciu, L.A., Stoicescu, E.R., Bolinteanu, S.L., Iacob, R., Sandesc, M.A., Faur, A.C. Aldose Reductase as a Key Target in the Prevention and Treatment of Diabetic Retinopathy: A Comprehensive Review, *BIOMEDICINES*, Volume: 12, Issue: 4, Article Number: 747, PubMed ID: 38672103, eISSN: 2227-9059, 2024;

Times Cited in Web of Science Core Collection: 38

Abstract: The escalating global prevalence of diabetes mellitus (DM) over the past two decades has led to a persistent high incidence of diabetic retinopathy (DR), necessitating screening for early symptoms and proper treatment. Effective management of DR aims to decrease vision impairment by controlling modifiable risk factors including hypertension, obesity, and dyslipidemia. Moreover, systemic medications and plant-based therapy show promise in advancing DR treatment. One of the key mechanisms related to DR pathogenesis is the polyol pathway, through which aldose reductase (AR) catalyzes the conversion of glucose to sorbitol within various tissues, including

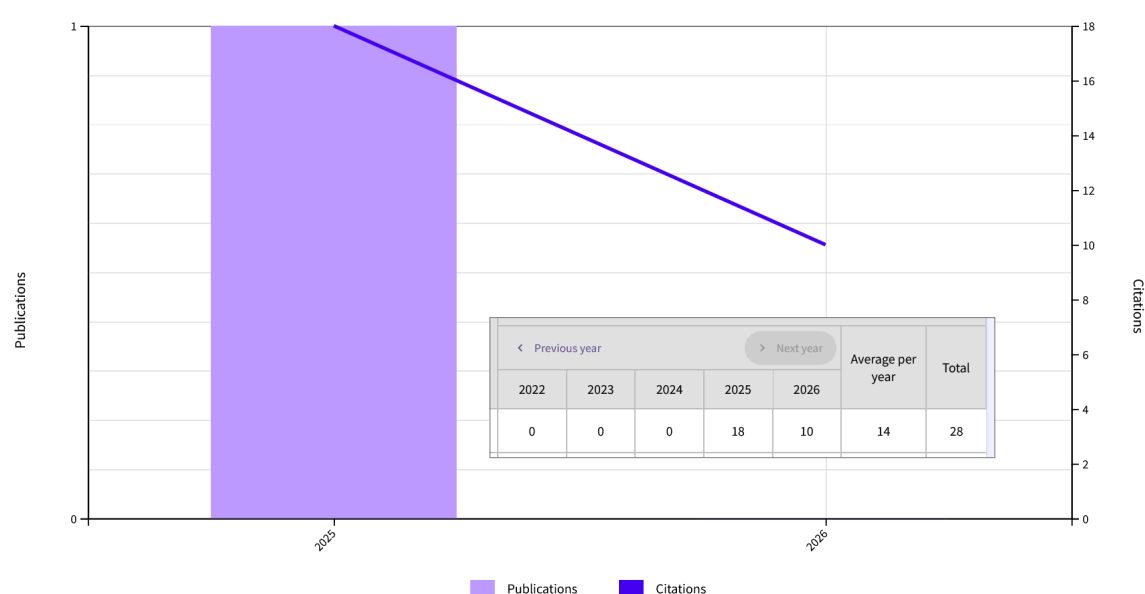
the retina, lens, ciliary body and iris.

Elevated glucose levels activate AR, leading to osmotic stress, advanced glycation end-product formation, and oxidative damage. This further implies chronic inflammation, vascular permeability, and angiogenesis.

Our comprehensive narrative review describes the therapeutic potential of aldose reductase inhibitors in treating DR, where both synthetic and natural inhibitors have been studied in recent decades. Our synthesis aims to guide future research and clinical interventions in DR management.

Web of Science - Clarivate Analytics Highly Cited Paper

As of November/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Engineering** based on a highly cited threshold for the field and publication year.



26

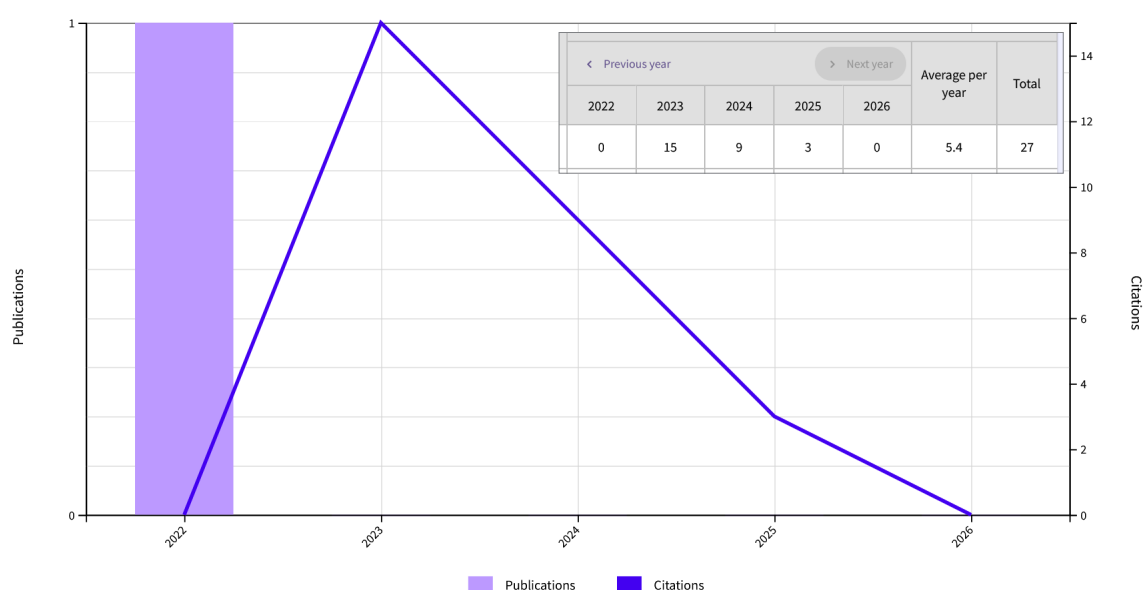
Brateanu, A., Balmez, R., Avram, A., Orhei, C., Ancuti, C. LYT-NET: Lightweight YUV Transformer-Based Network for Low-Light Image Enhancement, IEEE SIGNAL PROCESSING LETTERS, Volume: 32, Pages: 2065–2069, ISSN: 1070-9908, eISSN: 1558-2361, 2025; Times Cited in Web of Science Core Collection: 28

Abstract: This letter introduces LYT-Net, a novel lightweight transformer-based model for low-light image enhancement. LYT-Net consists of several layers and detachable blocks, including our novel blocks-Channel-Wise Denoiser (CWD) and Multi-Stage Squeeze & Excite Fusion (MSEF)-along with the traditional Transformer block, Multi-Headed Self-Attention (MHSA). In our method we adopt a dual-path approach, treating chrominance channels U and V and

luminance channel Y as separate entities to help the model better handle illumination adjustment and corruption restoration. Our comprehensive evaluation on established LLIE datasets demonstrates that, despite its low complexity, our model outperforms recent LLIE methods.

Web of Science - Clarivate Analytics Highly Cited Paper

As of January/February 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Mathematics** based on a highly cited threshold for the field and publication year.



27

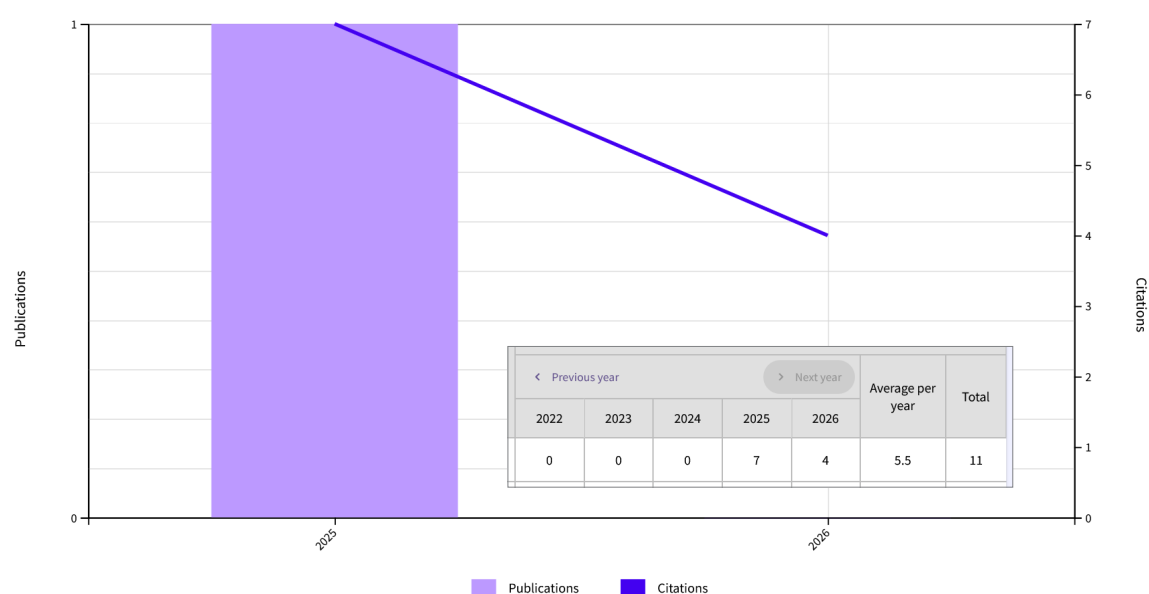
Precup, R.E., Duca, G., Travin, S., Zinicovscaia, I. PROCESSING, NEURAL NETWORK-BASED MODELING OF BIOMONITORING STUDIES DATA AND VALIDATION ON REPUBLIC OF MOLDOVA DATA, PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A-MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE, Volume: 23, Issue: 4, Pages: 403-410, ISSN: 1454-9069, 2022;
Times Cited in Web of Science Core Collection: 27

Abstract: This paper suggests an approach to process and model the data obtained in biomonitoring studies. The approach is validated on data obtained from biomonitoring studies performed in the Republic of Moldova in 2015. Using the preliminary data, the decomposition on the basis of the pollution spectrum for the most polluted and cleanest sites is first carried out. The deviations of model predictions from the actual measurements are considered.

A correlation analysis is next performed to evidence the correlation of two geographical coordinates with chemical elements. Factor analysis and regression analysis are applied to highlight the nonlinear mechanisms specific to the obtained data. A multilayer neural network-based model is derived to describe the relationship of the pollution rank to the geographic coordinates. The predictive capabilities of the model are represented graphically.

Web of Science - Clarivate Analytics Highly Cited Paper

As of November/December 2025, this highly cited paper received enough citations to place it in the top 1% of the academic field of **Social Sciences, general** based on a highly cited threshold for the field and publication year.



28

Hu, L.Y., Liao, Y., Gao, K., Jin, S., Precup, R.E. Integration of e-scooter sharing with public transit on employment accessibility and equity, *TRANSPORTATION RESEARCH PART D—TRANSPORT AND ENVIRONMENT*, Volume: 140, Article Number: 104604, ISSN: 13619209, eISSN: 18792340, 2025;

Times Cited in Web of Science Core Collection: 11

Abstract: E-scooter sharing (ESS) is an emerging shared micro-mobility that may enhance urban travel accessibility. This study investigates the potential of ESS used as the feeder to public transit to improve accessibility compared to sole public transit. Meanwhile, the relationships among accessibility gains, the built environment, and socioeconomic distributions are investigated based on multi-source big data. An empirical analysis in Gothenburg of Sweden demonstrates that ESS can substantially enhance accessibility within a 30-minute travel time, with 15% of areas showing statistically

significant benefits. Moreover, the accessibility gains exhibit complex nonlinear relationships with the built environment and socioeconomic. High-income and nativeborn communities obtain an average of 80% accessibility gain, over 10% higher than other demographic groups. Some areas with significant concentrations of low-income and foreign-born populations rely on public transit but currently lack ESS to improve accessibility. Introducing ESS in these under-served areas could yield up to 143% accessibility gains.

BOOKS IN HIGHLIGHT

SMART MANUFACTURING SYSTEMS IN INDUSTRY 4.0

G. DRAGHICI

Published by: Editura Politehnica, 2025

Pages: 218

ISBN: 978-606-35-0631-4

Short description of the context

Smart manufacturing systems are the core of Industry 4.0. They represent a symbiosis between machines, people and data, capable of quickly responding to market changes, optimizing resources and creating personalized products.

Purpose and Motivation of the book

The book is a resource for industrial professionals, researchers, students, and all those interested in understanding the complexity and potential of smart manufacturing systems, in the context of Industry 4.0.

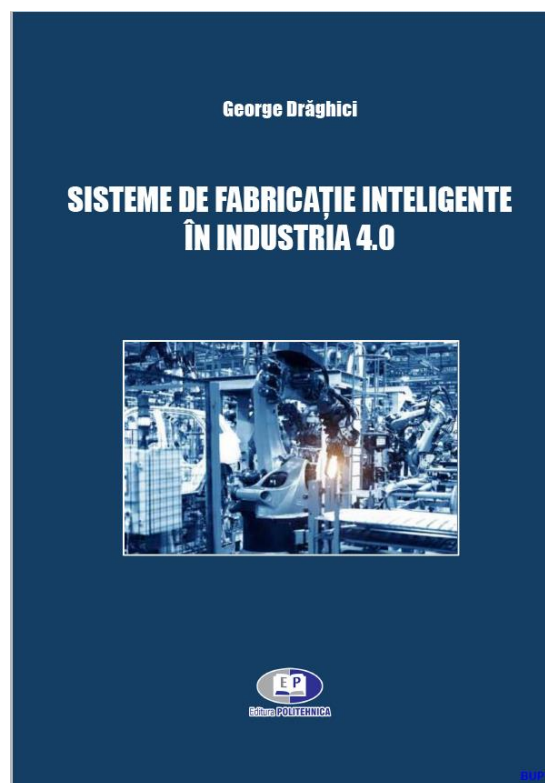
Summary

– The book is based on a literature review. The approach adopted uses Design Research Methodology (DRM) developed by Blessing and Chakrabarti (2009).

Applying this methodology, the following objectives are formulated and developed in the chapters of the book:

- **Objective 1** is to study the literature on manufacturing in the context of Industry 4.0.
- **Objective 2** is to gain in-depth knowledge of intelligent manufacturing systems and provide a basis for their efficient development.
- **Objective 3** focuses on defining the framework for the integration of intelligent manufacturing systems.
- **Objective 4** aims to implement an integrated intelligent manufacturing system, with application in the automotive industry and for mass customization, in the context of **Industry 4.0**.

– The last chapter presents the evolution and future of manufacturing systems in the context of **Industry 5.0**.



CLASSICAL AND MODERN OPTIMIZATION TECHNIQUES APPLIED TO CONTROL AND MODELING

Radu-Emil Precup, Raul-Cristian Roman, Elena-Lorena Hedrea,
Alexandra-Iulia Szedlak-Stinean, Iuliu Alexandru Zamfirache

Published by: CRC Press, 2025

Pages: 362

ISBN: 9781032785110

DOI: [10.1201/9781003488279](https://doi.org/10.1201/9781003488279)

Short description of the context

The book provides a detailed and unified presentation of the use of optimization for process control and modeling.

Purpose and Motivation of the book

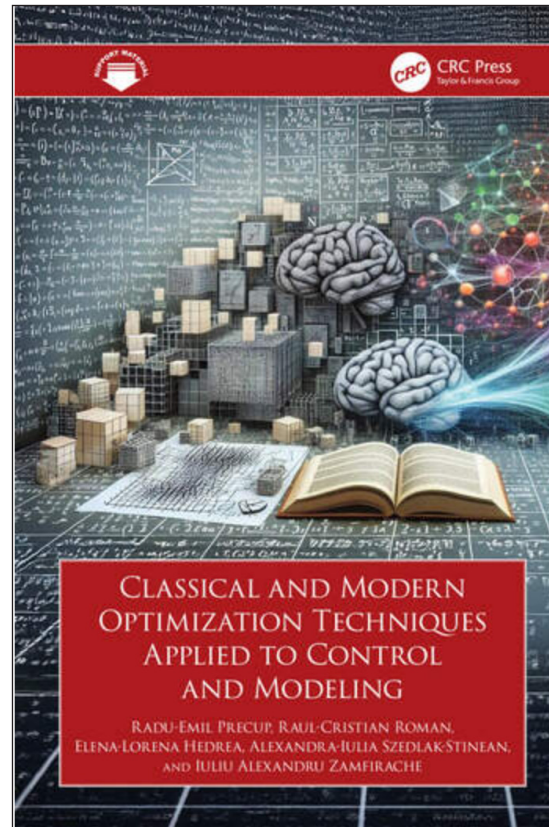
The book synthesizes classical and modern optimization techniques for controller design, demonstrating their practical relevance in automation and reducing system complexity.

Summary

This book falls within the fields of control engineering and applied optimization. It covers classical and modern techniques for linear and nonlinear models, including nature-inspired algorithms and reinforcement learning-based neural networks.

The book's structure aims to explain optimization, control, and modeling concepts through representative applications, such as tower crane systems. The table of contents is follows:

- **Chapter 1**– Introduction
- **Chapter 2**– One-step Optimization
- **Chapter 3**– Discrete-time Optimization
- **Chapter 4**– Numerical Solving of Optimization Problems
- **Chapter 5**– Metaheuristic Optimization Algorithms
- **Chapter 6**– Optimization Algorithms in Artificial Neural Network Training
- **Chapter 7**– Introduction to Data Mining
- **Chapter 8**– Reinforcement Learning Applied to Optimal Control



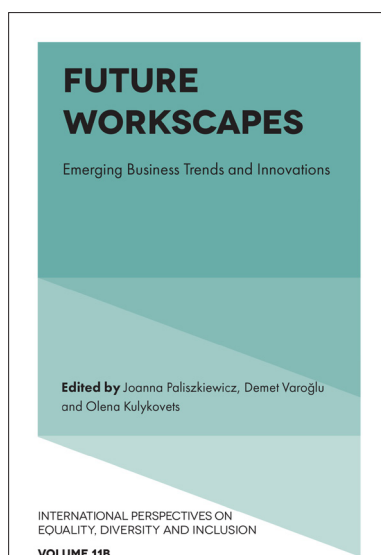
BOOKS LIST

1. Alic, D. D. Mecanică. Cinematică și dinamică. Lucrări și aplicații interactive — on-line, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0645-1;
2. Andraș, C.-M., Andraș, P. Descoperă magia jocului de șah. Noțiuni introductive, exerciții și diagrame, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0658-1;
3. Boatcă, M. E., Baera, C., Luminosu, C., Suci, S., Drăghici, A. Antreprenoriatul social în contextul colaborării dintre universități și comunitate, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0661-1;
4. Boatcă, M. E., Holenko Dlab, M., Mirce, G., Rozman, T., Drăghici, A. (Eds.). Manual de instruire a formatorilor pentru perfecționarea educatorilor, lucrătorilor și managerilor remote, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0680-2;
5. Bordeas, D. Modelling and control of isolated pumping systems, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0643-7;
6. Bordeas, I., Bordeas, D., Ghera, C. Noțiuni despre fabricarea rotoarelor de turbine hidraulice și turbopompe, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0673-4;
7. Buncianu, D., Mărgineanu, D.-T. Organe de mașini. Teme și aplicații practice. Partea I, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0636-9; ISBN 978-606-35-0637-6;
8. Capota, E. A. Digital signal processing between MATLAB and real-time, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0649-9;
9. Drăghici, A., Dungan, L. I., Iloie, L. M., Bănăduc, G., Bagiu, N., Stelea, N. Abordări practice și exemple în managementul proiectelor, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0610-9;
10. Drăghici, G. Sisteme de fabricație inteligente în Industria 4.0 — on-line, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0631-4;
11. Florica, C., Groza, I., Florica, S., Slavici, T. Toleranțe și control dimensional. Aplicații practice și de laborator, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0647-5;
12. Florica, C., Vetres, I., Opris, C., Trif-Tordai, G., Petculescu, I.-M., Zoț, M.-I., Bacoș, T.-B., Dungan, L. I., Lontis, N., Cioablă, A. Încercări experimentale. Aplicații practice — on-line, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0667-3;
13. Frâncu, C., Ghenciu, Ș. (Eds.). Catalog Beta 2024, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0669-7;
14. Galațanu, S.-V., Hlușcu, M. Rezistența materialelor. Solicitări compuse și dinamice. Calculul deplasărilor, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0641-3;
15. Hălbac-Cotoară-Zamfir, R. (Ed.). Proceedings of LAND4FLOOD 2025 Conference, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0657-4;
16. Ionel, S. Polifonie. Ediția a II-a revizuită și adăugită, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0675-8;
17. Munteanu, I.-S. Dispozitive medicale neimplantabile. Noutăți tehnologice și tendințe evolutive — on-line, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0656-7;

18. Munteanu, I.-S. Dispozitive medicale neimplantabile. Noutăți tehnologice și tendințe evolutive, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0672-7;
19. Munteanu, I.-S., Ungureanu, L. M. Aplicații didactice mecatronice. Simulări virtuale cu Arduino, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0662-8;
20. Nagy, R., Menyhardt, K. Mecanică. Aplicații practice, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0674-1;
21. Neguț, N. (Coord.), Pîrvulescu, L.-D. (Coord.); Mateescu, A. (Autor), Negru, R.-M. (Autor) Universitatea Politehnica Timișoara, Facultatea de Mecanică. Profesori de rezistența materialelor. 1921–2001, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0668-0;
22. Pașcalău, R. Translation practices and regulations in companies, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0639-0;
23. Para, I., Riteș, I., Dejica, D. Dicționar explicativ și contextual englez–român cu termeni specializați din domeniul intelligence, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0660-4, ISBN 978-630-327-234-4;
24. Peter, F., Todea, A., Dreavă, D. M. (Eds.). Book of Abstracts. The 14th International Conference on Protein Stabilization 2025, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0670-3;
25. Popa, G. N., Iagăr, A., Dimiș, C. M. Calitatea energiei electrice. Aplicații și experimentări, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0633-8;
26. Popescu, M., Cocea, E. Dicționar de termeni auto: francez–roman, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0653-6;
27. Precup, R.-E., Roman, R.-C., Hedrea, E.-L., Szedlak-Stinean, A.-I., Zamfirache, I. A. Classical and Modern Optimization Techniques Applied to Control and Modeling, Boca Raton, FL: CRC Press, 2025, 362 p., ISBN 978-1-032-78511-0;
28. Spătaru, C.-R. România încotro? Analiza multidimensională a dezvoltării în context European, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0678-9;
29. Stângaciu, C.-S., Capota, E.-A. Real time systems programming. From theory to practice, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0663-5;
30. Stolojescu-Crișan, C.-L. Networking essentials. A student's guide, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0677-2;
31. Stoian, F. D., Trif-Tordai, G., Popescu, F., Stoica, V., Ilie, M., Holotescu, S. Termotehnica. Aplicații practice, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0634-5;
32. Tirian, G.-O., Toța, P. Mecatronică și robotică. Aplicații, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0635-2;
33. Vărzaru, N. Operations management system with LEAN, Editura Politehnica, Timișoara, 2025, ISBN 978-606-35-0655-0.

BOOK CHAPTER LIST

- 1 Drăghici, A., Bănăduc, G., Sîrbu, R. M., Attila, T.-S., A Study on Environment, Social and Governance Disclosure in the Case of the Packaging Sector in Romania, *Future Workscapes*, Volume 11B, International Perspectives on Equality, Diversity and Inclusion Book Series, pp. 91–112, 2025, DOI: 10.1108/S2051-23332025000011B006. Indexed in Web of Science (Book Chapter, indexed 2025–10–31);
2. Stângaciu, C.-S., Task Allocation Techniques for Real-Time Mixed Criticality Multicore Systems: A Survey, *Mastering Time – Innovative Solutions to Complex Scheduling Problems*, Chapter 7, IntechOpen, London, UK, 2025, ISBN: 978-1-83769-427-3, DOI: 10.5772/intechopen.1009825;
- 3 Stângaciu, V., Real-Time Communication Protocols for IoT and Wireless Sensor Networks: A Short Survey, *Multi-Agent Systems* (IntechOpen Book Series: Artificial Intelligence), Chapter 0, IntechOpen, London, UK, 2025, DOI: 10.5772/intechopen.1010437.





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Editura **POLITEHNICA**

ISSN 1841-2769
ISSN-L 1841-2769