



2026



Technological Innovation to Tackle Societal Challenges

17th Advanced Doctoral
Conference on Computing,
Electrical and Industrial Systems

Program Booklet

17-19th June

Caparica (Lisbon), Portugal



For additional information visit:
<https://doceis.dee.fct.unl.pt/>

In association with
YEF-ECE 2026

10th Young Engineers Forum on
Electrical and Computer Engineering

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Welcome Message

Welcome to the 17th Advanced Doctoral Conference on Computing, Electrical, and Industrial Systems (DoCEIS 2026).

It is our great pleasure to welcome you to this year's edition of DoCEIS, a conference dedicated to fostering innovation, multidisciplinary collaboration, and academic excellence among doctoral researchers in engineering and related fields.

In a world increasingly shaped by complex and interconnected challenges, research and technological innovation play a decisive role in building sustainable, intelligent, and resilient solutions. Advances in AI-driven cyber-physical systems are transforming industries, infrastructures, services, and everyday life, while simultaneously creating new opportunities for societal impact and value creation. In this context, DoCEIS 2026 highlights how emerging technologies and multidisciplinary approaches can contribute meaningfully to addressing pressing societal needs.

DoCEIS has long served as a dynamic forum where doctoral students can present and discuss their ideas, hypotheses, methodologies, and research results across a broad spectrum of engineering domains. Beyond showcasing scientific achievements, the conference aims to stimulate dialogue, encourage collaboration, and promote constructive exchange among early-stage researchers, supervisors, and experts from different disciplines. Participants are invited not only to deepen their expertise within their specific research areas but also to reflect on the broader societal implications and interdisciplinary dimensions of their work.

This year's conference, sponsored by SOCOLNET, IFIP WG5.5, and IEEE IES, attracted 62 submissions from PhD students and supervisors representing 22 countries. Following a rigorous review process conducted by the International Program Committee, 36 papers were selected for presentation in the main program. The selected contributions span a wide range of topics, including:

- AI in Systems Design
- Computational Intelligence and Machine Learning
- AI in Biomedical Systems
- Smart and Fair Energy Communities
- Intelligent Energy Systems
- Water Management Systems
- Human-centered Intelligent Systems
- Interoperability and Collaborative Decision Making
- Smart Cities and Sustainable Urban Systems
- Smart Infrastructures

We believe that the diversity and quality of the research presented at DoCEIS 2026 will inspire fruitful discussions, stimulate new collaborations, and encourage further exploration of innovative multidisciplinary pathways. We hope this conference experience will contribute not only to scientific advancement but also to the personal and professional development of all participants.

We would like to express our sincere gratitude to all authors for their valuable contributions, to the PhD students involved in the organizing committee for their dedication and commitment, and to the members of the International Program Committee for their careful evaluations and insightful feedback, which greatly enhanced the quality of the conference and this proceedings volume.

This year we are pleased to also include, as an associated event, the YEF-ECE 2026, the 10th International Young Engineers Forum on Electrical and Computer Engineering, which also attracted a good number of submissions.

We hope that all participants will take the opportunities offered by these events to exchange experiences and knowledge with colleagues from different universities and areas of research.

Prof. Luis M. Camarinha-Matos
Conference Chairman

Prof. Filipa Ferrada
Program Co-Chair

Message from the Organizers

Welcome to DoCEIS 2026, the 17th edition of the Advanced Doctoral Conference on Computing, Electrical and Industrial Systems.

It is with great pleasure that we welcome you to this year's conference and thank you for being part of this event. Whether you are attending DoCEIS for the first time or returning from previous editions, your presence and participation are fundamental to the continued success and growth of this conference.

DoCEIS is much more than an academic conference. It is, above all, a student-driven initiative created by PhD students, for PhD students. From defining the scientific program to coordinating reviews, managing logistics, communicating with sponsors and publishers, and organizing all conference activities, every aspect of this event has been developed through the dedication and collaborative effort of doctoral students. This experience represents not only an organizational challenge, but also a unique opportunity for personal and professional growth.

This year, we are also particularly pleased to host, once again, YEF-ECE 2026 as an associated event, further strengthening the spirit of collaboration and exchange among young researchers.

We believe this conference provides an excellent environment for the exchange of ideas, the discussion of emerging challenges, and the establishment of new collaborations among researchers from different scientific and cultural backgrounds. Beyond the technical sessions, we encourage all participants to take advantage of the opportunity to connect with fellow researchers, engage in meaningful discussions, and contribute actively to this vibrant scientific community.

We would like to express our sincere gratitude to everyone who contributed to making DoCEIS 2026 possible. In particular, we would like to thank Professors Luís M. Camarinha-Matos, Filipa Ferrada, Pedro Pereira, Sanaz Nikghadam Hojjati, Bruno Guerreiro and Anikó Costa for their continuous guidance, encouragement, and trust in the student organizing team. We are also deeply grateful to the members of the International Program Committee for their careful and constructive reviews, to the keynote speakers and panelists for accepting our invitation and sharing their expertise, and to all authors and participants for their valuable contributions to the conference.

Finally, we extend our appreciation to every PhD student involved in the organization of this edition. Their commitment, dedication, and countless hours of work were essential to bringing this conference to life.

We hope that DoCEIS 2026 will become a memorable milestone in your academic journey, not only for the scientific knowledge shared, but also for the connections established, the ideas exchanged, and the inspiration gained throughout these days.

We wish you an inspiring, engaging, and successful conference. Enjoy DoCEIS 2026, enjoy Caparica, and make the most of this opportunity to learn, collaborate, and be inspired.

Warm regards,

The Local Organizing Committee

DoCEIS 2026 Conference Organisation

Conference and Program Committee Chair:

Luis M. Camarinha-Matos, NOVA University of Lisbon, Portugal

Program Committee Co-Chair:

Filipa Ferrada, NOVA University of Lisbon, Portugal

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Pedro Pereira, NOVA University of Lisbon, Portugal

Sanaz Nikghadam Hojjati, NOVA University of Lisbon, Portugal

Bruno Guerreiro, NOVA University of Lisbon, Portugal

Anikó Costa, NOVA University of Lisbon, Portugal

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Antonio Monte Pegado, Portugal
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David Leiria, Portugal

Nuno Nunes, Portugal
Rui Estevão, Portugal
Diogo Nuno Natário, Portugal
Gonçalo Galvão, Portugal

Special Sessions Organizers

Special Session on **Smart and Fair Community Energy Systems**: Bridging Technology, People, and Energy
Organizers: *Ramon Vilanova & Sebastián Madrigal, Spain*

Special Session on **Smart Cities and Sustainable Urban Systems**: Data-Driven Solutions for Quality of Life Enhancement
Organizers: *Izabela Jonek-Kowalska, Agnieszka Kowalska-Styczeń, Aneta Michalak, Katarzyna Sienkiewicz-Małyjurek, Radosław Wolniak, Poland*

Special Session (Workshop) on **Sustainable Data Driven Business Innovation for Societal Impact**: Navigating Digital Transformation for Long-Term Value
Organizers: *Arianit Kurti, Sweden & Bahtijar Vogel, Germany*

Invited Keynote Speakers

Elvira Fortunato – FCT-NOVA, Portugal

Sustainability in electronics: from materials to devices

The rapid expansion of electronic technologies, driven by wearables, IoT systems, and large-area sensing, continues to challenge global sustainability efforts. Electronic waste has reached unprecedented levels, with 62 Mt generated worldwide in 2022 and projections surpassing 82 Mt by 2030. This accelerating waste stream, combined with the depletion of finite raw materials, underscores a critical question: How can we sustain technological growth while reducing environmental impact?

A central part of the solution lies in the development of sustainable electronic materials and low-energy fabrication methods that break away from conventional silicon-based, resource-intensive manufacturing. Two promising and complementary research directions are emerging: transparent amorphous oxide electronics and laser-induced graphene (LIG) using for example cellulose.

Transparent amorphous oxide semiconductors offer exceptional electronic performance, mechanical flexibility, and, uniquely, optical transparency. Their ability to be processed at low temperatures enables high-mobility thin-film transistors (TFTs), transparent circuits, and unobtrusive optoelectronic systems. These materials also open doors for paper-based and biodegradable electronics, where our laboratory has been internationally recognized as a pioneer, demonstrating fully functional devices on renewable substrates.

In parallel, laser-induced graphene, produced through a single-step, maskless photothermal process, provides an energy-efficient approach to generate highly conductive carbon architectures directly on bio-derived substrates such as cellulose, cork, and other lignocellulosic materials. LIG avoids scarce metals, minimizes process complexity, and enables digital, on-demand manufacturing of conductive patterns for sensors, energy devices, and biomedical platforms. Importantly, because both precursor and substrate can be biodegradable, LIG represents a realistic route to circular electronics.

This plenary talk will highlight how transparent oxide electronics and green LIG materials can converge to reshape the future of sustainable technologies. By integrating advanced functionality, high-mobility semiconductors, transparent conductors, carbon-based electrodes, with renewable, low-impact substrates, we demonstrate electronic devices that meet performance requirements while drastically reducing environmental footprint. Together, these strategies offer a transformative vision: electronic systems that are not only smarter and more efficient, but also sustainable, recyclable, and aligned with global climate goals.



Bio. Elvira Fortunato has built a career marked by scientific, academic, and political leadership, with recognized impact at both national and international levels. Holding a PhD in Microelectronics, she is a pioneer in the field of transparent electronics and the inventor of the first paper transistor. She is currently the most cited researcher at NOVA University Lisbon. She has held positions of high responsibility, most notably serving as Minister of Science, Technology and Higher Education, where she promoted policies aimed at strengthening the connection between science, higher education, and the country's major societal challenges. She led structural reforms, including the revision of the higher education funding model, the creation of dedicated study places for students from the lowest income bracket, and the launch of the FCT-Tenure programme to promote stability in scientific careers. She also coordinated the National Semiconductor Strategy, positioning Portugal within the framework of the European EU Chips Act programme. She served as Vice-Rector of NOVA, with responsibility for research, where she led a structural transformation of the research support system. She created the Strategic Science Council, launched NOVA Science magazine and NOVA Science Day, and restructured the Research Support Office with a focus on scientific strategy, project management, and research information. During this period, she also stood out for promoting gender equality, coordinating the SPEAR project and establishing the Office for Equality and Inclusion. She further served as Principal Scientific

Adviser to the European Commission, providing direct advice to European Commissioners and coordinating strategic studies on carbon capture technologies and sustainable mobility within the framework of the EU Scientific Advice Mechanism.

On the scientific front, she directed the Associate Laboratory i3N, a European reference in advanced materials, sustainable electronics, and nanotechnology, which has secured twelve ERC grants, hundreds of international projects, and dozens of patents. Under her leadership, i3N consolidated its position as Portugal's leading institute in Advanced Materials Science and Engineering and Nanotechnology and pioneered the creation of the first national doctoral programme in Nanotechnologies and Nanosciences.

Her career has been recognized with more than 50 national and international distinctions, including the Pessoa Prize, the European Commission's Horizon Impact Award, the Human Rights Medal of the Portuguese Parliament, and recognition as one of the 27 most inspiring women in Europe by the French Presidency of the Council of the European Union.

Beyond her scientific impact, she is an active advocate of science education as a driver of social and economic development, promoting STEM fields, gender equality, and the training of new generations of scientists. She regularly participates in international conferences, forums, and science outreach initiatives, championing science as a tool for inclusion, accessibility, and sustainability. Her vision integrates research, innovation, science policy, and civic engagement, reflected in a career of real, transformative, and lasting impact in service to society.

Khaled Benkrid - Anglia Ruskin University, UK

Industry 5.0: Technological, Socio-Economic, Environmental and Political Projections

The confluence of generative AI, robotics, IoT and human creativity is transforming industry, and the way humans live, work, and collaborate with machines. This keynote will present the foundational technologies at the heart of this transformation, demonstrate several exciting use cases of Industry 5.0, and highlight socio-economic, environmental and political projections of Industry 5.0, positive and negative. The keynote will attempt to charter a possible way forward that maximizes opportunity and minimizes risk.



Bio. Dr. Khaled Benkrid has 25+ years' experience in higher education teaching, research, and policy development. Prior to joining Arm Ltd in 2013, he was a UK-based academic for 13 years, teaching, researching, and leading in various areas of computer science and electronics engineering, particularly in high-performance embedded computing and electronic design automation. Khaled supervised 15+ successful PhD research projects during his academic career and co/authored 100+ publications in major international conferences and journals. He is now Visiting Professor at the School of Computing and Information Science, Anglia Ruskin University, UK.

Tal Soffer - Tel Aviv University, Israel

Engineering the Socio-Technical Future: Foresight, Ethics, and Responsible Innovation in the Age of Intelligent Systems

"We shape our tools, and thereafter our tools shape us." Marshall McLuhan's observation captures the defining dynamic of the age of intelligent systems. Artificial intelligence, digital infrastructures, and cyber-physical systems are not merely advancing technological capability, they are reorganizing how societies

function. They influence how institutions govern, how trust is built, how labor is structured, and how opportunities are distributed.

Technological transformation is inseparable from social transformation.

This presentation examines how technology foresight can support engineers and computing professionals in navigating accelerating technological transformation and its societal implications. Intelligent systems are reshaping labor markets, redistributing decision-making authority, redefining accountability, and raising critical concerns about privacy, surveillance, algorithmic bias, and digital inequality. Without anticipatory approaches, technological acceleration risks outpacing ethical reflection and regulatory adaptation.

Integrating foresight with ethics, privacy-by-design principles, and Responsible Research and Innovation (RRI) allows technological development to move beyond compliance toward anticipatory responsibility. By exploring alternative futures, identifying systemic risks, and embedding ethical reflection early in research and design processes, we can better align intelligent systems with societal values such as fairness, resilience, democratic accountability, and human autonomy.

Engineering the socio-technical future therefore requires not only technical excellence, but ethical reflexivity and strategic anticipation, ensuring that intelligent systems strengthen societal trust and well-being rather than amplify surveillance, exclusion, or inequality.



Bio. Tal Soffer, Ph.D, a senior faculty member at the Gray Faculty of Medical and Health Sciences and the School of Education in Tel Aviv University. Director of the center for Technology & Society Foresight and Digital Pedagogy and the Head of the Digital Health MSc program. She has extensive research experience of more than 30 years in the field of Technology Foresight and its relations with societal applications such as: Digital Health, Security, Education and cyber technologies specialization in online learning, Privacy and Ethics; and the Future of labor market. With more than 60 projects over the years, national and EU research grants as coordinator and PI. Consulting to policymakers and a member of several scientific committees. More than 150 publications in scientific journals, EU research and conferences.

Horizontal Session Speaker



Graham Miller is the Rodrigo Guimarães Professor of Sustainable Business at Nova School of Business and Economics, Lisbon, and Academic Director of the Westmont Institute of Tourism and Hospitality. Graham is the former Pro-Vice-Chancellor at the University of Surrey, UK where he had university level responsibility for sustainability and employability and was also Executive Dean of the Faculty of Arts and Social Sciences.

Graham is consistently listed amongst the top 1% of global scientists and has been recognised by the Academy of Social Sciences for the impact of his research on society. Graham's ability to balance academic rigour with industry needs is demonstrated by previous roles as lead judge for the World Travel and Tourism Council's Tourism for Tomorrow Awards and co-editor of the Journal of Sustainable Tourism, the leading academic journal dedicated to the sustainability of the tourism industry.

Program Overview

	Morning	Afternoon
Day 1 17 June	Opening Session Keynote 1: <i>Elvira Fortunato, Sustainability in Electronics</i> A1. Computational Intelligence and Machine Learning A2. Smart and Fair Energy Communities	B1. AI-Powered Healthcare B2. Human-centered Intelligent Systems Horizontal Session: Graham Miller, Maximizing Social & Environmental Impact from Research C1. Water Management Systems Posters Welcome Reception
Day 2 18 June	D1. Intelligent Energy Systems D2. Interoperability and Collaborative Decision Making E1. Workshop. Sustainable Data Driven Business Innovation for Societal Impact E2. AI in Systems Design	Keynote 2: <i>Khaled Benkrad, Industry 5.0</i> Panel: Renewables Meet Resilience, João Martins, Pedro Carvalho, Patrícia Fortes, Rui Pestana, João Galamba, Ricardo Rabelo Site Visit Conference Dinner
Day 3 19 June	Opening YEF-ECE 2026 F1. AI in Biomedical Systems Y1. Circuits, Sensing and Hardware Design Y2. Large Language Models, Agents and AI-Driven Applications Y3. Computer Vision, Deep Learning, and AI for Real-World Applications Y4. Intelligent Automation and Decision Support for Industry and Smart Cities Y5. IoT, Edge Computing, and Cloud Systems	Keynote 3: <i>Tal Soffer, Tel Aviv University</i> G1. Smart Cities and Sustainable Urban Systems Y6. Speech, Audio and AI-Assisted Healthcare Y7. Power Systems, Drives and Energy Conversion Closing Session & Awards

Detailed Schedule DoCEIS 2026

Day 1 – Wednesday 17th June 2026

09:00 – 09:30 Opening session (Room Caparica B)

09:30 – 10:30 Keynote 1 (Room Caparica B)

Sustainability in Electronics

Elvira Fortunato, NOVA University Lisbon, Portugal

10:30 – 10:45 Coffee break

10:45 – 12:45 Session A

A1 – Computational Intelligence and Machine Learning (Caparica B Room)

Chairs: Antonio Monte Pegado and Diogo Nuno Natário

Comparative Survival Analysis Using Machine Learning Models with and without Topological Data Analysis

Mavambu Diankatu, Vítor Filipe, Jorge Duque and José Braga de Vasconcelos

Machine Learning on Small Datasets under Resource Constrained: A Scoping Review

Renato Leite and Rui Esteves Araújo

Fourier Apparent Front: A Method of Generating Apparent Fronts Without a Template

Andrei Pătrăușanu, Adrian Florea, Mihai Neghină, Radu Chiș and Alina Dicoiu

WASP it Up: Estimating Parameters under Noisy Observations

Filipe Vieira and Francisco Coelho

A2 – Smart and Fair Energy Communities (Cristo-Rei Room)

Chairs: Ramon Vilanova and Sebastián Madrigal

A Deep Learning Approach to Electric Water Heater Thermal Modelling for Demand Response Applications

Francisco Januário-Silva, João Tabanêz Patrício, Rafael Menezes-Barros and Rui Amaral Lopes

Towards Scalable Demand Response Solutions for Households in Citizen Energy Communities

Pau Comas, Antoni Morell, Ramon Vilanova and Jose Lopez Vicario

Community-Focused Energy Management System with Modular Architecture

Laurențiu-Alex Mustață, Elena Helerea, Cristian-Leonard Mușuroi and Rodolfo

Dufo López

Predictive Control and Optimization Strategies for Smart and Fair Operation in Energy Communities

S. Madrigal, A. Morell, J. L. Vicario, O. Arrieta and R. Vilanova

12:45 – 14:15 Lunch

14:15 – 16:15 Session B

B1 – Smart Infrastructures (Caparica B Room)

Chairs: David Leiria and Daniel Ferreira

Multi-Agent Framework with Blockchain-Based Audit Trails for Securing Industrial Greenhouse Gas Monitoring Infrastructure

Timileyin Abiodun, Nnamdi Nwulu and Peter Olukanmi

Graph-Based Generation of Navigable 3D Environments from Deformable Map Pieces

Diogo de Andrade and Nuno Fachada

Urban Traffic Control Enabled by Optical IoT and Deep Reinforcement Learning

Gonçalo Galvão, Manuela Vieira, Manuel Augusto Vieira, Mário Véstias and Paula Louro

Using Artificial Intelligence to Predict Gunfire Deaths

Eurico Clemente, Luis M. Camarinha-Matos, Filipa Ferrada

B2 – Human-centered Intelligent Systems (Cristo-Rei Room)

Chairs: Rui Estevão and Nuno Nunes

Human Robot Collaborative Creativity: Challenges and Opportunities

Zahra Babaei, Sepideh Kalateh, Sanaz Nikghadam-Hojjati, Paulo Leitão and Jose Barata

Agentic Monitoring for Industrial Sensors in Cyber-Physical Systems: A Reproducible Framework with Safety Guardrails

Miguel Afonso Beckers, Pedro João Rodrigues, Paulo Leitão, Cesar Augusto Tacla and Pedro Luiz de Paula Filho

Towards Secure Media Deepfake Detection Using Explainable AI

S. Rajathi, J. Hemalatha, S. Rajeswari, S. Parameswaran, D. Ramya and S. Balamurugan

Human-in-the-loop Refinement of Knowledge Graph Embeddings for Semantic Similarity

Verdiana Schena, Simona Colucci, Floriano Scioscia and Francesco Maria Donini

16:15 – 16:30 Coffee break

16:30 – 17:30 Horizontal Session (Caparica B Room)

Maximizing Social & Environmental Impact from Research

Speaker: **Graham Miller**, NOVA SBE, Portugal

17:30 – 19:00 Session C

C1 – Water Management Systems (Caparica B Room)

Chairs: *Diogo Nuno Natário and Gonçalo Galvão*

Deep Learning-Based Acoustic Leak Detection and Classification in Water Distribution Systems Using Hydrophone Sensors

Ajibola Oyedeji, Nnamdi Nwulu and Peter Olukanmi

Digital Transformation Framework for Sustainable Water-Energy-Food Nexus in South Africa

Oluwadamilola Esan, Nnamdi Nwulu and Adepoju Omoseni Oyindamola

Reconstructing Fragmented Flood Histories: A Benchmark of Imputation Methods for Flood Loss Modeling

Miguel Estêvão, Pedro A.C. Sousa, Gracinda R. Guerreiro, João P. Pimentão and Maria Isabel Gomes

17:30 – 19:00 Posters (Cristo-Rei Room)

Chairs: *Manuel Vinhas and Omid Aghda*

A Multi-Objective Optimization Framework for Climate-Resilient Investment Planning in Electricity Distribution Networks

Sérgio Sousa, João Martins and José Maia

Scalability and Compatibility challenges in next-generation Wi-Fi networks

David Leiria, Paulo Pinto and Luis Bernardo

19:00 Welcome reception

Kick off DoCEIS'26 in style! Our Welcome Reception happens on June 17th at 7:00 PM at the stunning TRYP Caparica Rooftop. Expect great conversations, complimentary food and beverages, and a live DJ set during the first hour to set the mood.

Day 2 – Thursday 18th June 2026

09:00 – 10:30 Session D

D1 – Intelligent Energy Systems (Caparica B Room)

Chairs: *Omid Aghda and Gonçalo Galvão*

Study of a DC-DC Buck Converter as a Class D Amplifier

José Francisco Luís and Nuno Paulino

Toward High-Fidelity Datasets for Hybrid Electric Vehicle Energy Management Incorporating Power Converter Non-Idealities

Henar Mike O. Canilang, Yurim Cheon, Youjeong Yoon and Wansu Lim

How Machining State is Driving Energy Performances in AI-Guided Industries?

Andrea Bochicchio, Fabio Fruggiero and Francesco Mancusi

D2 – Interoperability and Collaborative Decision Making (Cristo-Rei Room)

Chairs: Zahra Babaei and Antonio Monte Pegado

Semantic Execution of a High-Level Petri Net for Opportunity-Driven Decision-Making in Collaborative Business Ecosystems

Javaneh Ramezani, Luis Gomes and Paula Graça

Support IOPT-Tools Interoperability through Import and Export PNML-compliant Format

Diogo Nuno Natário, Anikó Costa and Luis Gomes

Transforming Isolated Data Lakes into Federated Dataspace: A Sovereign Architecture for Precision Medicine

Nuno Nunes, Pedro A. Sousa, Gracinda R. Guerreiro, João P. Pimentão and Maria Torrente

10:30 – 10:45 Coffee break

10:45 – 12:45 Session E

E1 – Workshop on Sustainable Data Driven Business Innovation for Societal Impact (Caparica B Room)

Chairs: Arianit Kurti and Bahtijar Vogel

Introduction

Data driven innovations – Arianit Kurti

Sustainable digitalization – Bahtijar Vogel

Brief discussions

Workshop session

Summary and next steps

E2 – AI in Systems Design (Cristo-Rei Room)

Chairs: Daniel Ferreira and Rui Estevão

Human-AI Agentic Approach for Industrial Software Systems Design

Antonio Monte Pegado, Luis M. Camarinha-Matos and Andre Dionisio Rocha

Digital Sovereignty in Organisational End-to-End Processes: An Early-Stage Design-Oriented Research Roadmap

Andreas Schneider, Thomas Schuster, Mario Bosslau and Lukas Waidelich

AI-driven DevSecOps to Enhance Software Quality and Security

Nuno Teixeira Gomes, João Rafael Almeida and José Luís Oliveira

Toward Agentic Privacy-by-Design: A Conceptual Framework for AI-Supported Process Compliance

Lukas Waidelich, Thomas Schuster, Andreas Schneider and Mario Bosslau

12:45 – 14:15 Lunch

14:15 – 15:15 Keynote 2 (Caparica B Room)

Industry 5.0

Khaled Benkrid, Anglia Ruskin University, UK

15:15 – 15:45 Coffee break

15:45 – 17:45 Panel Session (Caparica B Room)

Renewables Meet Resilience: Towards the Energy of Tomorrow

Moderator: João Martins, FCT NOVA

Panelists:

Pedro Carvalho, IST, Portugal

Patrícia Fortes, LNEG & CENSE, Portugal

Rui Pestana, R&D NESTER, Portugal

João Galamba, Enline, Portugal

Ricardo Rabelo, UFSC, Brazil

18:00 – 20:30 Bus transfer and Site visit

20:30 – 22:30 Conference dinner

Day 3 – Friday 19th June 2026

08:45 – 09:00 Opening session YEF-ECE

09:00 – 10:30 DoCEIS Session F, YEF-ECE Sessions Y1 and Y2

F1 – Smart Cities and Sustainable Urban Systems (Caparica B Room)

Chairs: Izabela Jonek-Kowalska, Agnieszka Kowalska-Styczeń, Aneta Michalak and Katarzyna Sienkiewicz-Matyjurek

Analysis of Environmental Profiles of Logistics Companies in Estonia to Enhance Technology Choice

Rene Maas, Eduard Shevtshenko, Hendrik Laanemets, Tatja-na Karaulova and Rõõt Laigu

Smart Governance for Better Living: Empirical Analysis of Public Services and Digital Transformation Impact on Urban Quality of Live

Sara Rupacz, Izabela Jonek-Kowalska and Aneta Michalak

Using Digital Participatory Platforms for Deliberation Aimed at Achieving Sustainable Development Goals

Kamila Roźnowska and Katarzyna Sienkiewicz-Małyjurek

Y1 – Circuits, Sensing and Hardware Design (Cristo-Rei Room)

Chairs: Paula Louro and João Pedro Oliveira

A Reconfigurable LiDAR Scanning Platform for Emulating and Evaluating Fixed-Resolution Time-of-Flight Sensors in Electronic Travel Aids

Nuno Bezelga, Joel Paulo, Alessandro Fantoni

Authentication block for AMBA Advanced Peripheral Bus;

João Ramos, Luis Oliveira, Jean Mousinho

Automated Sizing of Cascode Compensated Amplifiers via Adaptive Genetic Algorithms

Guilherme Pacheco Faias, Joao Balancho, Rui Tavares

Carrier-Depletion-Controlled 2×2 Optical Switch Using Weakly Coupled Shallow-Rib Strip Directional Couplers in Standard 0.22 × 0.50 μm a-Si:H Waveguides

Ernesto Velazquez, Alessandro Fantoni, Paulo Lourenço

Design and Simulation-Based Characterization of a Portable 16-bit Optoelectronic Acquisition System for Luminescence Detection in Resource-Limited Environments

Cristiano Barata, Aniko Costa

Y2 – Large Language Models, Agents and AI-Driven Applications (Almada Room)

Chairs: Mário Vestas and João Pedro Matos-Carvalho

A Hybrid ML-LLM Cascade System for Cost-Efficient Phishing Webpage Detection

Yusuf Özaslan, M. Fatih Adak

Large Language Model-Assisted Natural-Language-to-SQL Pipeline for Project Management in Aviation Certification

Ana Venda, Ruben Costa, Bruno Rega, Ricardo Jardim-Gonçalves

From Model to Agent: A Modular LLM-Based Agent Framework for Multi-Agent Systems

Tomás Loureiro, Filipa Ferrada, Thais Baldissera

Prototyping an LLM-Based AI Agent for Operator Support in Augmented Reality Industrial Quality Inspection

Martim Latas, Gabriel Marques, Rui Neves Madeira, Pedro Albuquerque Santos, Patrícia Macedo

A Scalable Lakehouse Architecture for AI-Driven Cybersecurity Intelligence

Nastaran Farhadighalati, Alex Di Giulio, Alessandro Lusci, Riccardo Valentini, Jose Barata

10:30 – 10:45 Coffee break

10:45 – 12:45 YEF-ECE Sessions Y3, Y4 and Y5

Y3 – Computer Vision, Deep Learning, and AI for Real-World Applications (Caparica B Room)

Chairs: Rogério Campos-Rebelo and Afonso Fernandes Oliveira

Can We Grow Data? A Hybrid Pipeline for Synthetic Agricultural Data Generation

Narciso Manjor, Rui Porfírio, Pedro Albuquerque Santos, Rui Neves Madeira

Energy-Efficient Micro-Defect Detection in Printed Circuit Boards with Cross-Domain Generalization via Multi-Head Scalable Attention

Jinsu An, Tao Peng, Byeong Woo Kim

Evaluating Open-Text 3D Segmentation from 3D Reconstructed Point Clouds

Paulo Cortesão, Helder Araújo

YOLO-Based Architectures for Grapevine Disease Detection

Vasco Marmelo, João Pedro Matos-Carvalho, Sérgio Correia

Smart Window 2030: Integration of Electrochromic Glass and Machine Learning Technologies

Ricardo Jorge, Joana Vaz Pinto, Rui M. Tavares

Analyzing the Effect of Identity in Static Facial Expression Recognition

Rui Guimarães, Helder Araujo

Analysis of suspended sediments in water using satellite imagery and artificial intelligence

Miguel Paiva, João Pedro Matos-Carvalho, Filipe Moutinho

Y4 – Intelligent Automation and Decision Support for Industry and Smart Cities (Cristo-Rei Room)

Chairs: Luis Oliveira and Paulo Lourenço

Decentralized Traffic Signal Control Using Multi-Agent Reinforcement Learning and Visible Light Communication

Astride Morais, Gonçalo Galvão, Manuel Vieira, Mário Véstias, Manuela Vieira, Paula

<i>Louro</i>
An Experimental Framework for Networked Control Systems <i>Tiago Leite Barreiros, Luís Brito Palma</i>
Partner Selection in Consortia Creation: A Hybrid DSS Integrating MCDM, Blockchain, and GA <i>Alexandre Ferreira, Ana Inês Oliveira</i>
On-Device Real-Time License Plate Identification for Surveillance Systems <i>Sebastião Ferreira, Mário Véstias</i>
A BPMN Language Management System for the Integration of Industrial Business Processes <i>Joana Serrano, A. Luís Osório, Paula Graça</i>
Adaptive Urban Traffic Control Multimodal with AI and Visible Light Communication (VLC) <i>João Matos, Manuela Vieira, Gonçalo Galvão, Mário Véstias, Manuel Vieira, Paula Louro</i>
Augmented Reality Inspection Assistant Design for Quality Operator Support in Industry 5.0 <i>André Branco, Gabriel Marques, Rui Neves Madeira, Pedro Albuquerque Santos, Patrícia Macedo</i>

Y5 – IoT, Edge Computing, and Cloud Systems (Almada Room)

Chairs: Thais Baldissera and Alessandro Fantoni

Survey On the Design of CubeSat Ground Stations – Architectures and Communication Trade-Offs <i>Erica Alves, Rui Duarte</i>
A Unified Validation Framework for Heterogeneous IoT Data Models <i>João Rocha, Matilde Pato, Nuno Datia</i>
A Layered Secure Messaging Architecture for Cross-Organizational Manufacturing-as-a-Service <i>Marina Case, Ruben Costa, Luis Lourenco, Ricardo Gonçalves</i>
A Dual-Tier Edge-Cloud Architecture for Real-Time Basketball Activity Recognition and Fatigue Monitoring <i>Ricardo Monteiro, Aniko Costa</i>
Performance Analysis of DevOps Processes in Modern Cloud Platforms <i>Caner Şermet, Muhammed Fatih Adak</i>
A Modular Low-Cost Myoelectric Prosthetic Hand <i>David Matos Furtado, Luís Brito Palma, Rui Azevedo Antunes</i>

12:45 – 14:15 Lunch

14:15 – 15:15 Keynote 3 (Caparica B Room)

Engineering the Socio-Technical Future

15:15 – 15:30 Coffee break

15:30 – 17:30 DoCEIS Session G1, YEF-ECE Sessions Y6 and Y7

G1 – AI in Biomedical Systems (Caparica B Room)

Chairs: Manuel Vinhas and Nuno Nunes

A Review on Technological Requirements for Ultrasound Image-Guided Neuromodulation Application-Specific Integrated Circuits

Diogo Dias, Tiago Costa and João Goes

CancerCareTech: A Pilot Study on a Digital Platform for Multimodal Clinical Data Integration in Pediatric Oncology

Pedro Correia, Joana Dias, Alexandra Morais, Amets Sagarribay, Ana Ferreira, Ana Rita Londral, Carla Quintão, Catarina Santos, Mafalda Pires, Patrícia Santos, Paula Agulheiro and Cláudia Quaresma

Stability of Electrophysiological Signals: Findings from Preliminary Measurements in Different Clinical Environments

Ana Isabel Ferreira, Cláudia Quaresma and Carla Quintão

A Supervised Modular LLM Architecture for Personalized Management of Non-Communicable Diseases: A Proof-of-Concept Study

Ana Martins, Luís Velez Lapão, Isabel L. Nunes and Ana Londral

Y6 – Speech, Audio and AI-Assisted Healthcare (Cristo-Rei Room)

Chairs: Ruben Costa and Miguel Fernandes

Blood Type Classification Using DINOv2 Embeddings and Logistic Regression: A Preliminary Study with Quantization Analysis

Bruno Silva, Enmanuel Abilheira, Afonso Pinheiro, Ljilijana Dukanovic, Vitor Carvalho

Efficient Deep Neural Networks for Embedded Animal Sound Classification

Ezequiel Silva, Rui Jesus, Mário Véstias

A Preliminary Study on AI-Based Three-Class Classification of Syphilis' RPR Test Reactions

Enmanuel Abilheira, Bruno Silva, Ljilijana Dukanovic, Afonso Pinheiro, Vitor Carvalho

A comparative study of acoustic speech feature performance in vocal fold pathology detection

Verónica Silva, Gonçalo Marques, Carlos Meneses

Evaluating Open-Weight Large Language Models for a Local Clinical Assistant

Maria Joana Pires, Mário Véstias

Analysis-by-synthesis for predictive coding of speech signals

André Dias, Carlos Meneses

Y7 – Power Systems, Drives and Energy Conversion (Almada Room)

Chairs: Manuela Vieira and Anabela Pronto

Converting a Traditional Bicycle to Electric: Development of a Motor Controller and a Battery Charger

Francisco Machado, Rodrigo Pereira, Joao Afonso, Vitor Monteiro

Design and Implementation of a Dual Active Bridge DC–DC Converter for Photovoltaic Integration in a DC Microgrid

Cristiano Botelho, José Silva, Rui Esteves Araújo

Field-Weakening Control of a Synchronous Reluctance Machine Using FW and MTPV Trajectories and Single Supply DVSI

Luis Fernandes, Armando Pires, Vitor Pires

Deterministic and Probabilistic Assessment for Hosting Capacity in Distribution Networks

Nuno Bonacho, Francisco Silva Reis

Study of Power-over-Fiber Receiver Topologies for Multiple Optical Sources and Low-Power Devices

Rodrigo Costa, Daniel Graça, João Casaleiro, Carlos Carvalho

17:30 – 18:15 Closing Session and Awards (Caparica B Room)

Panel

Renewables Meet Resilience: Towards the Energy of Tomorrow



Pedro Carvalho

Full Professor at IST, Technical University of Lisbon, Portugal

Pedro Carvalho got his PhD degree in Electrical Engineering and Computers from Instituto Superior Técnico (IST), T, in 1999. He is an expert in the field of power systems planning and network optimization and is an entrepreneur in software development of decision support systems, having developed products with international acceptance by the industry of the field. He has been with the Department of Electrical Engineering and Computers at IST since 1992, where he is currently a Full Professor.

He is a researcher at the Instituto de Engenharia de Sistemas e Computadores - Investigação e Desenvolvimento, where he has been responsible for research and consulting projects in international consortia in the field of advanced planning, operation and control of power systems. He was also a collaborator of the Department of Electrical and Computer Engineering at Carnegie Mellon University in the USA, where he was an Adjunct Professor until 2023.

Patrícia Fortes

Laboratório Nacional de Energia e Geologia (LNEG) & CENSE – Center for Environmental and Sustainability Research, Portugal

Patrícia Fortes is a researcher at the Laboratório Nacional de Energia e Geologia (LNEG) and an invited researcher at the CENSE – Center for Environmental and Sustainability Research, where she coordinated the Energy and Climate research line between 2021 and 2025.

With more than 15 years of professional experience, her research focuses on low-carbon energy systems, including emerging energy carriers, circular economy strategies for climate mitigation, and climate risks for energy systems. Throughout her career, she has participated in several EU and national research projects at the energy–economy–environment interface and has extensive experience supporting the development of energy and climate policy in Portugal. Her contributions include the Portuguese Roadmap for Carbon Neutrality, where she was responsible for developing decarbonisation scenarios for the energy and industrial sectors, as well as more recent contributions to the National Energy and Climate Plan 2030.

Patrícia holds a PhD in Environment from NOVA University Lisbon (2014).





Rui Pestana
R&D NESTER, Portugal

Master degree, Engineer of Electrical Engineering and Computers from Instituto Superior Técnico, University of Lisbon, Portugal. He received the title of Expert in Energy by the Polytechnic Institute of Lisbon. Advisor of the System Operator division with REN - Rede Eléctrica Nacional S.A. (Portuguese TSO). Project leader on the research centre R&D NESTER. Invited Professor at ISEL – Instituto Superior de Engenharia de Lisboa, of the Polytechnic Institute of Lisbon. He has been working in several WG of CIGRE, ENTSO-E and European project funded by FP6, FP7, H2020 and Horizon Europe. He received the “CIGRE Technical Committee Award”.

João Galamba
Enline Energy, Portugal

Economist and energy policy specialist. He holds a degree in Economics from Universidade Nova de Lisboa and undertook doctoral studies in Political Science at the London School of Economics. Earlier in his career he held positions at Banco Santander de Negócios, the consultancy DiamondCluster International, and the Portuguese Presidency of the Council of the European Union. Elected to the Assembleia da República in 2009 on the Socialist Party lists, he served across three governments under Prime Minister António Costa as Secretary of State for Energy, Secretary of State for Environment and Energy, and Minister of Infrastructures (2023). He is currently Senior Strategy Advisor at Enline (Lisbon), an AI-driven energy asset management company, and independent consultant at Cascade Horizons. Since June 2025, he has also served as Councillor at both the Global Wind Energy Council (GWEC) and the Global Renewables Alliance (GRA), and as Executive Board Advisor at OHROS Consulting Group.



Ricardo Rabelo
Federal University of Santa Catarina, Brazil



Ricardo José Rabelo earned his bachelor’s degree in computer science from the Federal University of Santa Catarina (UFSC) in 1984, completed his PhD in Electrical and Computer Engineering at the NOVA University Lisbon in 1997, and conducted postdoctoral research at Griffith University in Brisbane, Australia, between 2014 and 2015 in Collaborative Innovation. At the Federal University of Santa Catarina since January 2000, he is currently a Full Professor in the Department of Automation and Systems Engineering and a member of the Graduate Program in Automation and Systems Engineering. He coordinates GSIGMA (Intelligent Manufacturing Systems and Collaborative Networks Group). His work focuses on Computer Science, Automation, and Production Engineering, with an emphasis on Information Models and Systems and infrastructures for applications in Industry 4.0, E-Business, Service-Oriented Architectures, Collaborative Enterprise Networks / Virtual Organizations / Local Productive Arrangements, and Collaborative Innovation.

Proceedings

DoCEIS 2026 Proceedings are published by Springer, under its IFIP AICT series.

Proceedings in digital format are available through a link provided at the conference website.



Similar to previous years, these proceedings will be submitted to indexing in ISI Web of Science, SCOPUS and DBLP.

Local

The conference will be held at [TRYP Lisboa Caparica Mar Hotel in Caparica](#).



How to Arrive at the Conference

By Car

- Directions can easily be mapped out via Google Maps (using the name from the hotel).

By Boat & Bus

- If you are taking the ferry, you can catch a bus from Cacilhas to "Costa de Caparica".
- *From the terminal, catch the **Carris Metropolitana bus 3011 or 3022** to Costa da Caparica.*

By Direct Bus (From Lisbon)

- If you are coming directly from Lisbon, Carris Metropolitana operates several direct bus lines to the Costa da Caparica terminal. Convenient routes include **3710** (departing from Areeiro), **3709** (from Marquês de Pombal), and **3708** (from Cais do Sodré).

By Uber or Taxi

- Ride-hailing apps are an often cheaper and convenient alternative to regular taxis.
- Please note there are higher fares at night.

Timetables for the Bus are available at: <https://carrismetropolitana.pt/>

Lunches

All conference lunches will be served at the **TRYP Caparica Rooftop**.

Access: Please ensure you have your conference badge with you. Access to the lunch area requires scanning the **QR code** provided on your badge, which you will receive during check-in.

Social Events

Welcome reception



A Welcome Reception will take place on the first day of the conference, the **17th**, starting at **7:00 PM**.

- **Location:** TRYP Caparica Rooftop.
- **Details:** Attendees will have access to complimentary food and beverages, accompanied by a DJ set during the first hour.

Conference dinner

The Conference Gala Dinner will be hosted at **Quinta de Catralvos, Azeitão**.

- **Transportation:** A dedicated bus will depart promptly at **6:00 PM** from the main entrance of the TRYP Caparica Hotel.
- **The Experience:** Participants will have the opportunity to enjoy a guided tour of the estate's cellars, learning about the winemaking process from the vineyard to the glass. The visit concludes with a wine tasting event.

Address: EN 379 Quinta de Catralvos – 2925-708 Azeitão



YEF-ECE 2026

10th International Young Engineers Forum on Electrical and Computer Engineering



Scope

Following the success of the previous editions, we are proud to announce the organization of the 10th International Young Engineers Forum on Electrical and Computer Engineering – YEF-ECE 2026.

Electrical engineers apply electrical and electronic theory to obtain solutions for problems related to the development, design and operation of electrical hardware and software, control systems, electrical machines, and communications systems. Computer engineers are concerned with the design, development, and implementation of new and challenging computer technology in a myriad of consumer, industrial, commercial, and military applications. Besides development, design, operations, and research, electrical and computers engineers are typically involved in the manufacture, installation, and maintenance of computational devices, electrical and electronic equipment and systems employed by a wide variety of organizations which produce, use or provide services to such equipment, and ranging from tiny electronic devices to large complex systems. The International Young Engineers Forum looks for the latest developments and innovative applications in electrical and computer engineering, dealing with systems' design and utilization, looking forward to efficient devices and systems with appropriate control algorithms to meet the needs of business and industry in a global economy. This event will be a unique opportunity for young engineers to connect with each other enabling experience's sharing and to become internationally active.

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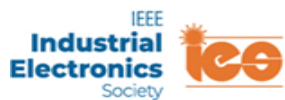
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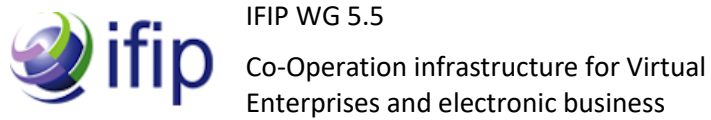
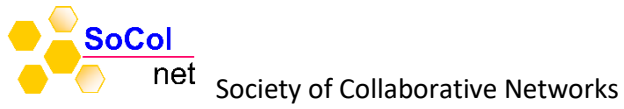
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Sessions Overview

DoCEIS 2026 & YEF-ECE 2026

Wednesday – 17 Jun 2026		Thursday – 18 Jun 2026		Friday – 19 Jun 2026		
09:00	Opening Session	09:00	D1 Intelligent Energy Systems	09:00	Opening YEF-ECE 2026	
09:30	Keynote 1 Sustainability in Electronics <i>Elvira Fortunato, NOVA FCT, Portugal</i>		D2 Interoperability and Collaborative Decision Making	09:00	F1 Smart Cities and Sustainable Urban Systems	Y1 Circuits, Sensing and Hardware Design
10:30	<i>Coffee break</i>	10:30	<i>Coffee break</i>	10:30	<i>Coffee break</i>	
10:45	A1 Computational Intelligence and Machine Learning	10:45	E1 Workshop Sustainable Data Driven Business Innovation for Societal Impact	10:45	Y3 Computer Vision, Deep Learning, and AI for Real-World Applications	Y4 Intelligent Automation and Decision Support for Industry and Smart Cities
	A2 Smart and Fair Energy Communities	12:45	E2 AI in Systems Design	12:45	Y5 IoT, Edge Computing, and Cloud Systems	
12:45	<i>Lunch</i>		<i>Lunch</i>		<i>Lunch</i>	
14:15	B1 Smart Infrastructures	14:15	Keynote 2 Industry 5.0 <i>Khaled Benkrid, Anglia Ruskin University, UK</i>	14:15	Keynote 3 Engineering the Socio-Technical Future <i>Tal Soffer, Tel Aviv University, Israel</i>	
	B2 Human-centered Intelligent Systems	15:15	<i>Coffee break</i>	15:15	<i>Coffee break</i>	
16:15	<i>Coffee break</i>	15:45	Panel	15:30	G1 AI in Biomedical Systems	Y6 Speech, Audio and AI-Assisted Healthcare
16:30	Horizontal Session Maximizing Social & Environmental Impact from Research <i>Graham Miller, NOVA SBE, Portugal</i>	17:45	Bus transfer	17:30	Y7 Power Systems, Drives and Energy Conversion	
17:30	C1 Water Management Systems	18:00	Site visit	18:15	Closing Session & Awards	
	Posters		Conference dinner			
19:00	Welcome Reception	20:30				

Rooms: Caparica B: A1, B1, C1, D1, E1, F1, Y3, G1, Plenary sessions
 Cristo-Rei: A2, B2, Posters, D2, E2, Y1, Y4, Y6
 Almada: Y2, Y5, Y7