13th Advanced Doctoral Conference on Computing, Electrical and Industrial Systems

Technological Innovation for Digitalization and Virtualization

June 29-July 1, 2022
Caparica (Lisbon) – Portugal

Including the associated event:
YEF-ECE 2022
Young Engineers Forum on Electrical and Computer Engineering
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Welcome Message

The 13th edition of the Advanced Doctoral Conference on Computing, Electrical and Industrial Systems, DoCEIS 2022, targets bringing together Ph.D. students, specialists, experts, engineers, and researchers from all around the world, inspired by inventive thoughts and procedures with a focus on Technological Innovation for Digitalization and Virtualization.

The ongoing 4th industrial revolution is characterized by an intense digitalization and digital transformation of all sectors of society. This encompasses the adoption and integration of a variety of new information and communication technologies for the development of more efficient, flexible, agile, and sustainable solutions. On the other hand, the recent pandemic forced millions of people to work or study from their homes, which created an immediate challenge for the organizations that were not prepared for this scenario. This led to a fast virtualization of the interactions and work environment. As a result, to effectively support digitalization and virtualization many different knowledge areas are coming together leading to the creation of various innovative technologies and tools, while also motivating new research directions.

DoCEIS 2022 aims at providing a venue for sharing and discussing ideas and results from doctoral research in various inter-related areas of engineering, while promoting a strong multi-disciplinary dialog. Furthermore, the conference aims at creating collaborative opportunities for young researchers as well as an effective way of collecting valuable feedback from colleagues in a welcoming environment. DoCEIS is intended to provide such an environment, releasing Ph.D. students from the pressure of presenting their propositions in more formal contexts. Furthermore, the conference aims at facilitating dialog among disciplines, opening new perspectives to young researchers towards a multi-disciplinary and interdisciplinary perspective.

This release of DoCEIS, which is supported by SOCOLNET, IFIP, and IEEE Industrial Electronics Society, attracted 50 paper submissions from Ph.D. students (and their supervisors) from 15 countries despite the pandemic circumstance. Out of these submissions, 22 were selected by the Program Committee. I’m especially grateful to every one of you that contributed with your high-quality work and hence allowed us to prepare this Program that will offer a very enriching experience to all participants.

A special word of thanks goes to the members of the International Program Committee who carried out the heavy task of evaluating all submissions.

This year we are pleased to also include, as an associated event, the YEF-ECE 2022, the 6th International Young Engineers Forum on Electrical and Computer Engineering, which also attracted a good number of submissions from 11 countries.

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
Message from the Organizers

Greetings and welcome to DoCEIS 2022!

Another year has passed, and the world is starting to push back against COVID-19 pandemic. We would like to reinforce our last year’s message: science for sure did not stop and neither did DoCEIS. Although, because conditions regarding the pandemic are not yet completely known, the 13th edition of DoCEIS will be held in a hybrid format. Therefore, we hope that you enjoy the thirteenth edition of the Advanced Doctoral Conference on Computing, Electrical and Industrial Systems in this new format. The conference, held from June 29th to July 1st, is organized in the context of the Electrical and Computer Engineering doctoral programme of the School of Science and Technology of NOVA University of Lisbon. The local organizing committee is mainly composed of PhD students or candidates from this doctoral programme. For us, co-organizing and being involved in all aspects of the conference, from program definition, dissemination, venue, sponsorship etc., has been quite an important and enriching experience that will accompany us throughout our careers, and will hopefully serve as a stepping-stone for the organization of future scientific events.

We would like to thank our keynotes and invited speakers for their availability in providing their time and knowledge at this event. To all participants, we thank you for your interest in having submitted your papers and posters to the conference. To the International Program Committee, our appreciation for all the hard work in the reviewing process.

We are celebrating the 13th edition of DoCEIS this year. In the last twelve years, DoCEIS has been an excellent venue for scientific dissemination for researchers, especially doctoral students that, often for the first time, are given the opportunity to have their work presented in an international conference, where they can discuss it with their peers in a familiar and welcoming environment.

In the previous editions we provided participants with opportunities to create new contacts and collaboration networks, or even just getting valuable feedback on their work by more experienced researchers. Although for the third year in a row the ongoing pandemic does not fully allow for the same kind of personal interaction, our efforts were to provide an engaging and similar mixed physical and virtual social experience.

Our objective at DoCEIS is to continuously provide a rich scientific programme and an open environment for sharing experiences and knowledge among all participants, instigating future collaborations. This year we count submissions from 15 countries, making DoCEIS a great opportunity to share and learn about significant scientific developments, to expand collaborative networks with people from similar fields of research and interests, and for exploring new domains of knowledge.

We wish everyone a very pleasant and rewarding conference - may DoCEIS 2022 be a positively memorable event!

The Local Organizers.
DoCEIS 2022 Conference Organisation

Conference and Program Chair:
Luis M. Camarinha-Matos, Portugal

Organizing Committee Co-chairs:
Luis Gomes, Portugal
João Goes, Portugal
João Martins, Portugal

International Program Committee

António Abreu, Portugal
Vanja Ambrožic, Slovenia
Frederick Bénaben, France
Luis Bernardo, Portugal
Xavier Boucher, France
Giuseppe Buja, Italy
Luis M. Camarinha-Matos, Portugal
Ricardo Carelli, Argentina
Laura Carnevali, Italy
Wojciech Cellary, Poland
Noélie Correia, Portugal
Jose de la Rosa, Spain
Filipa Ferrada, Portugal
Florin G. Filip, Romania
Maria Helena Fino, Portugal
Adrian Florea, Romania
José M. Fonseca, Portugal
Rosanna Fornasiero, Italy
Paulo Gil, Portugal
João Goes, Portugal
Luis Gomes, Portugal
Juanqiong Gou, China
Paul Grefen, Netherlands
Michael Huebner, Germany
Ricardo Jardim-Gonçalves, Portugal
Tomasz Janowski, Poland
Vladimir Katic, Serbia
Asal Kiazadeh, Portugal
Evgeny Kuzmin, Russia
Matthieu Lauras, France
Marin Lujak, France
João Martins, Portugal
Rui Melício, Portugal
Paulo Miyagi, Brazil
Filipe Moutinho, Portugal
Horácio Neto, Portugal
Paulo Novais, Portugal
Luis Oliveira, Portugal
Rodolfo Oliveira, Portugal
Angel Ortiz, Spain
Peter Palensky, Austria
Luis Palma, Portugal
Nuno Paulino, Portugal
Pedro Pereira, Portugal
Paulo Pinto, Portugal
Armando Pires, Portugal
Ricardo J. Rabelo, Brazil
Luis Ribeiro, Sweden
Juan Rodríguez-Andina, Spain
Enrique Romero-Cadaval, Spain
Carlos Roncero, Spain
Imre Rudas, Hungary
Roberto Sabatini, Australia
Ioan Sacala, Romania
Eduard Shevtshenko, Estonia
Thomas Strasser, Austria
Zoltán Ádám Tamus, Hungary

Kleanthis Thramboulidis, Greece
Damien Trentesaux, France
Manuela Vieira, Portugal
Ramon Vilanova, Spain
Valery Vyatkin, Sweden
Lai Xu, UK
Soufi Youcef, France

Local Organizing Committee (PhD Students)

Behrooz Saeidi, Portugal / Iran
Daniel Almeida, Portugal
David Leonardo, Portugal
Diogo Pereira, Portugal
Florindo Canas, Portugal
Fábio Oliveira, Portugal
Jorge Calado, Portugal
João Madeira, Portugal
Leandro Filipe, Portugal

Luis Lourenço, Portugal
Masoud Ardestani, Portugal / Iran
Miguel Lourenço, Portugal
Rafael Oliveira Rodrigues, Portugal
Sepideh Kalateh, Portugal / Iran
Shuai Liu, Portugal
Sonia Hosseinpour, Portugal / Iran
Terrin Pulikottil, Portugal / India
Invited Keynote Speakers

Keynote 1: Isabel Ramos, University of Minho, Portugal
Title: Mindful sociotechnical systems: connecting human and artificial intelligence in organizations

Short Bio: Isabel Ramos is an Associate Professor (Ph.D., Habilitation) at the Department of Information Systems of the School of Engineering of the University of Minho and researcher at the Research Center Algoritmi. She is president of the Portuguese Association for Information Systems, Chair of the IFIP Technical Committee 8 (Information Systems), and has recently been elected as Vice-President of Membership of the Association for Information Systems (AIS). Her contribution to the Information Systems field has been recognized with the attribution of the IFIP Outstanding Service Award (2009) and Silver Core Award (2013), as well as IIAKM – Lifetime Academic Achievement Award (2021). More details on https://orcid.org/0000-0001-8035-4703

Abstract: The study of IT applications’ use will undergo a paradigm shift in the next decade. Artificial intelligence (AI) applications make decisions, perform tasks with ambiguous requirements, learn based on pre-specified rules and heuristics, and collaborate with humans to achieve operational goals. Since the research of "Strong AI" (self-aware and conscious machines) is in its initial stage, in the next decade, AI applications will continue producing mindless rigidity in sociotechnical systems as they can only collect and process data based on pre-specified rules and heuristics or process new information based on what it has learned from previously accessed information. Highly-reliable organizations (HROs) theories propose that these organizations display a high collective ability to attend events as they unfold and monitor small signs of change, i.e., collective mindfulness. This collective mindfulness is particularly relevant to ensuring the reliability and adaptability of organizations operating in environments of great uncertainty and turbulence; it has very tangible means of being assessed by determining the collective preoccupation with failure, reluctance to simplify interpretations, commitment to resilience, sensitivity to operations and appreciation of expertise in decision-making processes.

In today’s organizations, collective mindfulness is achieved by combining mindless (nonconscious and non-self-aware) attention (AI) with mindful attention (Human). There is still no scientific knowledge about the sociotechnical configurations that leverage the effectiveness of this combination but a few insights are starting to emerge. In this lecture, this emerging research stream will be presented and venues for future research will be explored.

Keynote 2: Damien Trentesaux, Université Polytechnique Hauts-de-France, France
Title: Architecting Industrial Cyber-Physical-Human Systems: theories and applications

Short Bio: Damien Trentesaux (male) is full professor at the LAMIH UMR CNRS 8201 research lab of the Université Polytechnique Hauts-de-France (France). His areas of interest concern the sustainable control and optimization of discrete event systems (manufacturing, transport, logistics, and services) and their efficient and effective interaction with the human in the context of Industry 4.0 and industrial cyber-physical systems. Prof. Trentesaux has supervised 16 PhD thesis and is author and co-author of more than 200 peer reviewed publications in journals, books, and chapters of books and conference proceedings.

Abstract: Cyber-Physical Systems mix the physical and digital worlds through networks. This presentation deals with the architecting of Industrial Cyber-Physical-Human Systems where architectures are made up of autonomous artificial entities (agents, holons, etc.) orchestrated and
interacting with others and humans. Non-centralization is therefore a prerequisite for these architectures. Such entities implement a common function while at the same time they have to face the unexpected. The functions that are covered in this presentation are scheduling, supervision and maintenance. Several applications are presented as an illustration of the potential benefits of these architectures in production (industry 4.0), transportation and logistics.

**Keynote 3: Yang Liu, Linköping University, Sweden**  
**Title: Sustainable Smart Manufacturing – current reality and future prospect**

**Short Bio:** Yang Liu received his M.Sc. (Tech.) degree in telecommunication engineering and D.Sc. (Tech.) degree in industrial management from the University of Vaasa, Finland, in 2005 and 2010, respectively. He is currently a tenured Associate Professor and Doctoral Supervisor with the Department of Management and Engineering, Linköping University, Sweden, and a Chair Professor with Jinan University, China. Meanwhile, he is an Adjunct/Visiting Professor at multiple other universities. His research interests include sustainable smart manufacturing, product service innovation, decision support system, competitive advantage, control systems, autonomous robots, signal processing, and pattern recognition.

Prof. Liu has authored or co-authored over 100 Web of Science indexed publications. He is ranked No.1 among the top authors on “big data analytics in manufacturing”, and among the top 1% scientists in Engineering and Technology by Research.com. His publications have appeared in multiple distinguished journals, and some ranked in the top 0.1% ESI Hot Papers and top 1% ESI Highly Cited Papers. He serves as an Associate Editor of the prestigious Journal of Cleaner Production and Journal of Intelligent Manufacturing, referees in over 70 SCI leading journals with the Top Reviewer for Decision Sciences award by Publons (Web of Science). He also serves as an external reviewer for NSERC of Canada and CONICYT of Chile.

**Abstract:** Recent advancements in smart technologies, such as the Internet of Things, Cyber-Physical System, Cloud Computing, Artificial Intelligence, Big Data Analytics, Digital Twin, etc., have greatly stimulated the development of smart manufacturing. There is plenty of existing research in smart manufacturing and sustainable manufacturing. However, some issues are challenging but have not been properly addressed until now. Sustainable smart manufacturing aims to integrate and apply various smart technologies in the entire lifecycle and decision-making processes, uncover the real potential of lifecycle big data, achieve data and knowledge sharing among all lifecycle stages, and promote the realization of sustainable smart manufacturing in a lifecycle perspective. The talk will cover a holistic system view of sustainable solutions, particularly in the production and operations management, and emerging technologies in digitalization and modelling to form the new paradigm of sustainable smart manufacturing in a wider range of product lifecycles. The current state of the art and challenges are discussed, and future research directions are proposed.
## Program Overview

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Detailed Schedule DoCEIS 2022

Day 1 – Wednesday 29 Jun 2022

9:00 – 9:30 Opening session

9:30 – 10:30 Keynote 1

Mindful sociotechnical systems: connecting human and artificial intelligence in organizations
Isabel Ramos, University of Minho, Portugal

10:30 – 11:00 Coffee Break

11:00 – 13:00 Session A

A – Smart Systems Thinking
Chairs: Luis Lourenço, David Leonardo, Jorge Calado

- Modelling Mutual Influence Towards Sustainable Energy Consumption
  Kankam O. Adu-Kankam, Luis M. Camarinha-Matos

- Assessing the Benefits of Renewable Energy Communities: A Portuguese Case Study
  Humberto Queiroz, Rui Amaral Lopes, João Martins, Luís Fialho, João Bravo Dias, Nuno Bilo

- Open Innovation Association with Feeling Economy
  Sepideh Kalateh, Sanaz Nikghadam Hojjati, Luis Alberto Estrada-Jimenez, Terrin Pulikottil, José Barata

- Creating Meaningful Intelligence for Decision-Making by Modelling Complexities of Human Influence: Review and Position
  Paulo Pina, Rui Neves-Silva

13:00 – 14:30 Lunch Break

14:30 – 16:00 Session B

B – Smart Devices
Chairs: Sepideh Kalateh, Rafael Oliveira Rodrigues

- Rib Waveguide Plasmonic Sensor for Lab-On-Chip Technology
  Daniel Almeida, João Costa, Alessandro Fantoni, Manuela Vieira

- An Energy-Efficient Wideband Input-Buffer for High-Speed CMOS ADCs
  David Leonardo, João Goes

- Novel Graphene Electrode for Electromyography using Wearables based on Smart Textiles
  Manuel Humberto Herrera Argiró, Cláudia Quaresma, Hugo Plácido Silva

16:00 – 16:30 Coffee Break
16:30 – 18:30  Session C

**C – Cyber-Physical Systems**

*Chairs: Shuai Liu, João Madeira, Miguel Lourenço*

- **Asynchronous Communication between Modular Cyber-Physical Production Systems and Arduino based Industrial Controllers**  
  Fábio M. Oliveira, André Rocha, Duarte Alemão, Nelson Freitas, José Barata

- **Mechanisms for Service Composition in Collaborative Cyber-Physical Systems**  
  Artem A. Nazarenko, Luis M. Caminha-Matos

- **Hippo-CPS: Verification of Boundedness, Safeness and Liveness of Petri net-based Cyber-Physical Systems**  
  Marcin Wojnakowski, Mateusz Popławski, Remigiusz Wiśniewski, Grzegorz Bazydło

- **Estimation of the End-to-End Delay in 5G Networks through Gaussian Mixture Models**  
  Diyar Fadhil, Rodolfo Oliveira

19:00 – 20:30  Welcome Reception

Day 2 – Thursday 30 June 2022

9:00 – 11:00  Session D

**D – Health-related Digitalization**

*Chairs: Fábio Oliveira, Masoud Ardestani, Florindo Canas*

- **Towards Digital Twin in the Context of Power Wheelchairs Provision and Support**  
  Carolina Lagartinho-Oliveira, Filipe Moutinho, Luís Gomes

- **Real-Time PPG-Based HRV Implementation Using Deep Learning and Simulink**  
  Filipa Esgalhado, Arnaldo Batista, Valentina Vassilenko, Manuel Ortigueira

- **Neuromotor Evaluation of the Upper Limb During Activities of Daily Living: A Pilot Study**  
  Patrícia Santos, Cláudia Quaresma, Inês Garcia, Carla Quintão

- **Gesture-based Feedback in Human-Robot Interaction for Object Manipulation**  
  Leandro Filipe, Ricardo Silva Peres, Francisco Marques, José Barata

11:00 – 11:30  Coffee Break

11:30 – 13:00  Session E

**E – Control and Digital Platforms**

*Chairs: Diogo Pereira, Leandro Filipe*

- **PLC as the Main Controller for Additive Manufacturing Machines**  
  Gerson Fabio da Silva, Marcosiris Amorim de Oliveira Pessoa, Paulo Eigi Miyagi, Ahmad Barari, Marcos Sales Guerra Tsuzuki
● Dynamic and Efficiency Study Applied to Automotive Vehicles  
*S. André, Nelson Santos, G. O. Duarte, P. Almeida, P. M. Fonte, R. Pereira*

● Digital Platform for Environmental and Economic Analysis of Wire Arc Additive Manufacturing  
*Samruddha Kokare, Radu Godina, João P. Oliveira*

**13:00 – 14:30**  Lunch Break

**14:30 – 15:30**  Keynote 2

*Architecting Industrial Cyber-Physical-Human Systems: theories and applications*

*Damien Trentesaux, Université Polytechique Hauts-de-France, France*

**15:30 – 16:00**  Coffee Break

**16:00 – 18:00**  Panel Session

*My research in a Digitalized World*

*Carla Ferreira, NOVA School of Science and Technology & NOVA LINCS*

*Cláudia Soares, NOVA School of Science and Technology & NOVA LINCS*

*Paulo Condado, CENSE – Center for Environmental and Sustainability Research*

*Manuel Pio, EDP NEW R&D*

*Ricardo Martins, NOVA Information Management School*

*Terrin Pulikottil, UNINOVA*

**19:30 – 22:30**  Conference Dinner

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**Day 3 – Friday 1 July 2022**

**9:00 – 11:00**  DoCEIS Session F, Opening YEF-ECE and YEF-ECE 1

*F – Electric Systems and Machines*

*Chairs: Daniel Almeida, Sonia Hosseinpour, Terrin Pulikottil*

● Exploring Electric Vehicles Energy Flexibility in Buildings  
*Daniel Dias, Rui Amaral Lopes, João Martins*

● A Rule-based Method for Efficient Electric Vehicle Charging Scheduling at Parking Lots  
*George Konstantinidis, Emmanuel Karapidakis, Alexandros Paspatis*

● A Novel Photovoltaic Maximum Power Point Tracking Method using Feedback Conductance Integral Compensation  
*S. André, J. Fernando Silva, Sónia F. Pinto, Pedro Miguens Matutino*

● Reduction of Air-Gap Flux Density Distortion for a 20 kW HTS Induction Motor  
*Masoud Ardestani and Hamid Reza Izadfar*
**Opening YEF-ECE 2022**

**Y1 – Electronics, Networks and Grids**

*Chair: Luis Oliveira*

  João Madeira, João Guerreiro and Rui Dinis
- An electrical model characterization of an electronic nose chemical sensor using a programmable system-on-a-chip based AFE  
  João J. M. Santos, Susana I. C. J. Palma, Carina Esteves, João Pedro Oliveira, Hugo Gamboa and Ana C. A. Roque
- Configurable Mapping of EtherCAT field-level devices to OPC UA  
  Balakrishna Balakrishna, Alexander Barth and Alexander Willner
- B2G (Buggy-to-Grid): Vehicle-to-Grid (V2G) concept in microgrids with strong penetration of electric vehicles  
  Guilherme Santos, João Murta-Pina and Ricardo Belém
- True Random Number Generator Implemented in 130 nm CMOS Nanotechnology  
  Pedro Monteiro and Luís Oliveira

**11:00 – 11:30 Coffee Break**

**11:30 – 13:00 YEF-ECE 2 and YEF-ECE 3**

**Y2 – IoT and Networks**

*Chair: Luis Gomes*

- IoT Based Targeting System - Airsoft Use-Case  
  Martim Vieira, João Pedro Matos-Carvalho, Sérgio D. Correia and Rui Tavares
- A scalable incremental algorithm for computing the evolution of structural virality in social networks  
  Rodrigo Calzada Haro, Félix Cuadrado Latasa and Javier Andión Jiménez
- Proposal of an IoT Architecture for Greenhouse Monitoring  
  Victor Lisnic, Filipa Ferrada and Patricia Correia
- GloFood: A Community-oriented System for Knowledge Sharing and Collaboration  
  Pedro Alves, Luís M. Camarinha-Matos and Majid Zamiri
- Extending the Synoptics of Things (SoT) Framework to Manage ISoS Technology Landscapes  
  Bruno Serras, Carlos Gonçalves, Tiago Dias and Luís Osório

**Y3 – Measurement and Sensors**

*Chair: João Murta Pina*

- Low-Cost Multi-Frequency Eddy Current Coating Thickness Measurement System  
  Ana C. Santos, André Barrancos, Luís S. Rosado and Fernando M. Janeiro
- Preliminary Analysis of Core Losses and Performance of an Axial Flux Motor
with High Temperature Superconducting Tapes on the Rotor
João Pinto, Fábio Gregório, Roberto de Oliveira, Xavier Granados and João Murta-Pina

Assessment of a Sonic Sensor for Measuring AC Losses in Superconducting Devices
Ricardo Walker, Diogo Durão, Diogo Dias, Isabel Catarino, João Murta-Pina and Roberto Oliveira

Coverage Characterization of LoRaWAN Sensor Networks for Citrus Orchard Monitoring
Bruno Mendes, Dário Passos and Noélia Correia

13:00 – 14:30 Lunch Break

14:30 – 15:30 Keynote 3

Sustainable Smart Manufacturing – current reality and future prospect
Yang Liu, Linköping University, Sweden

15:30 – 16:00 Coffee Break

16:00 – 17:30 Posters, Horizontal Session and YEF-ECE 4

Posters
Chairs: Behrooz Saeidi

- Inclusive and collaborative IoT systems design
  Jorge M. S. Calado and João Sarraipa

- Sustainability through IoT digital Solutions
  Rafael Oliveira Rodrigues, João Sarraipa and Ricardo Goncalves

Horizontal Session
Communication in Science
Ana Sanchez, ITQB, Portugal

Y4 – Control Systems
Chair: Rui Neves-Silva

- Applying Deep Neural Networks to Improve UAV Navigation in Satellite-less Environments
  Ricardo Santos, João P. Matos-Carvalho, Slavisa Tomic, Marko Beko and Sérgio D. Correia

- Indoor location infrastructure for time management tools: a case study
  André Teixeira, Rui Esteves Araújo and Hélder Silva

- Simulation and Control of a Cyber-Physical Elevator Prototype
  Duarte Santos, Luís Brito Palma and Vasco Brito

- Irrigation Management System using Artificial Intelligence Algorithms
  Gonçalo Mestre, João Pedro Matos Carvalho and Rui Tavares

- Adhesion estimation based novel approach to control wheel slip in electric locomotives
  Shikha Saini and Ganga Singh Bhawaria
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Horizontal Session

Ana Sanchez, Assistant Professor & Head of the Communication Office at ITQB NOVA.

Title: Communication in Science

Short Bio: Ana Sanchez is currently the head of the Communication Office at ITQB, a research institute in chemistry and biology. Her duties include both institutional communication and the institute’s outreach program. In addition, she is committed to science communication training within ITQB and together with António Granado (FCSH), has started and now coordinates a Masters Course in Science Communication at UNL. She holds a PhD in Biology from the University of Nijmegen, The Netherlands (2001) and has worked as a post-doctoral researcher in a plant molecular biology lab.

Abstract: In an increasingly complex world, communicating science to non-specialists is essential. Scientists from all areas are challenged to simplify their message and interact with a wide range of audiences, but it’s not always easy to ensure an effective transmission of a scientific message without sacrificing accuracy. Like other transversal skills, communication skills require practice.

Panel

Carla Ferreira

Associate Professor at Computer Science Department, NOVA School of Science and Technology | FCT NOVA & Researcher at NOVA LINCS

Carla started her academic career as an Assistant at Universidade do Minho. After that, she joined the Dependable Systems & Software Engineering Group (DSSE) of the University of Southampton, first as a PhD student and later as a research fellow. After returning to Portugal in 2003, she was an Assistant Professor at IST.

Cláudia Soares

Assistant Professor at NOVA School of Science and Technology | FCT NOVA & Researcher at NOVA LINCS

Cláudia Soares holds the Ph.D., M.Sc., and B.Sc. degrees in electrical and computer engineering from the Instituto Superior Técnico, Portugal, and the degree in modern languages and literature from the Nova University of Lisbon. She uses real-world data problems to identify the shortcomings of current machine learning, data science, and big data methods. She applies optimization, statistics, and probability theory to address those gaps, developing robust, interpretable, and fair learning methods that can be trusted in real life. Her application areas are in healthcare, transportation, environmental and urban sciences, and space.
Paulo Condado
Researcher at CENSE – Center for Environmental and Sustainability Research

Paulo Condado proposed several solutions to assist people with motor disabilities and/or speech disorders, namely (a) a system, called EasyVoice, that combines text-to-speech with voice over IP and text-entry methods to allow people with speech disorders to make phone calls, (b) a text-entry method, called EasyWrite, that allows people with low hand coordination to use small touchscreen devices, (c) a system to allow people with disabilities and their family members to control their home environments using mobile devices, and (d) a low-cost and multi-functional robotic solution to enrich assisted living environments.

In June 2019, Paulo started a research work to develop inexpensive robotic solutions, as well as alternative environment control methods, to enrich smart environments used by people with limitations. Paulo Condado has an important mission to fulfil. He wants to apply his knowledge to make the world a better place for those who have disabilities.

Manuel Pio
Head Digital Energy EDP NEW R&D

Manuel Pio is currently the head of Digital Energy area at EDP NEW R&D, leading the work in European funding projects related to Renewable Energy forecasting, 5G, Energy Data Spaces and intelligent image recognition and classification. In complement, he is coordinating the consultancy works for Mozambique’s Energy main utility on customers’ big data and supporting the work with data for several projects related with Smart Cities and Energy grids. He holds a MsC in Electric and Electronic Engineering, a MsC in Management and a Post-Graduation in Data Science and Analytics. Prior to join EDP in 2000, he worked in Communication consultancy, was technical lecturer and collaborated in academic R&D in the field of power electronics. He is also Director of a NGO supporting pregnant women in need. Fan of swimming and hiking whatever the weather.

Ricardo Martins
Invited Assistant Professor & Researcher at NOVA Information Management School (NOVA IMS)

Ricardo holds a master in Marketing Intelligence and received his Ph.D. in Information Management at the Universidade NOVA de Lisboa. His research interests are focused on the study of the diffusion of technological artefacts that can be used by firms to become more efficient and competitive. Also, his interests include the user behaviour towards the adoption and use of technological innovations. He has published his research in academic outlets, such as Computers in Human Behavior, International Journal of Information Management and Information Technology & People. He is also the Manager of the R&D center of NOVA IMS – MagIC and participates in some H2020 and Horizon Europe projects, such as Managing Digital Transformation (Erasmus +), TwinERGY (H2020), TwinAIR (HorizenEurope), DeRisk (HorizonEurope).
Terrin Pulikottil
PhD Student & Researcher at UNINOVA

Terrin currently works as a researcher in UNINOVA on H2020 DIMAND project and is also pursuing his Ph.D. in Electrical and Computer Engineering from Nova University of Lisbon. Previously, He worked as a Research Fellow in National Research Council of Italy for three years in Institute for Intelligent Industrial Technologies and Systems for Advanced Manufacturing (STIIMA). He also has industrial experience as technical deputy manager for Carborundum Universal, a materials manufacturer. He completed his master’s degree from Politecnico di Milano, Italy in Mechanical Engineering and bachelor’s degree in manufacturing engineering from Anna University, India. His research interest focuses on developing an intelligent manufacturing shop-floor.
Proceedings

DoCEIS 2022 Proceedings are published by Springer, under its IFIP AICT series. Proceedings in digital format are available through a link provided at the conference website (starting June 24th and during the following three weeks).

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

Welcome reception

Welcome reception will be held on Campus.come restaurant.

Conference dinner

Conference dinner will be held on Solar dos Zagallos.

The address is: Largo António José Piano Júnior, Sobreda.

The how to get instructions can be accessed through this link.
Scope

Following the success of the 2017, 2018, 2019, 2020, and 2021 editions we are proud to organize the 2022 International Young Engineers Forum on Electrical and Computer Engineering – YEF-ECE 2022.

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 2022 International Young Engineers Forum combines the latest developments and applied research 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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João Martins

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Rui Neves-Silva
Rodolfo Oliveira

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## Detailed Schedule YEF-ECE 2022

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<th>Time</th>
<th>Session Details</th>
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<tr>
<td>9:00 – 09:15</td>
<td>Opening Session</td>
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<tr>
<td>9:15 – 11:00</td>
<td><strong>Session Y1: Electronics, Networks, and Grids</strong>&lt;br&gt;Chair: Luis Oliveira&lt;br&gt;<strong>A Software Defined Radio Implementation of Physical Layer Security Using MIMO-SVD</strong>&lt;br&gt;João Madeira, João Guerreiro and Rui Dinis&lt;br&gt;<strong>An electrical model characterization of an electronic nose chemical sensor using a programmable system-on-a-chip based AFE</strong>&lt;br&gt;João J. M. Santos, Susana I. C. J. Palma, Carina Esteves, João Pedro Oliveira, Hugo Gamboa and Ana C. A. Roque&lt;br&gt;<strong>Configurable Mapping of EtherCAT field-level devices to OPC UA</strong>&lt;br&gt;Balakrishna Balakrishnan, Alexander Barth and Alexander Willner&lt;br&gt;<strong>B2G (Buggy-to-Grid): Vehicle-to-Grid (V2G) concept in microgrids with strong penetration of electric vehicles</strong>&lt;br&gt;Guilherme Santos, João Murta-Pina and Ricardo Belém&lt;br&gt;<strong>True Random Number Generator Implemented in 130 nm CMOS Nanotechnology</strong>&lt;br&gt;Pedro Monteiro and Luís Oliveira&lt;br&gt;11:00–11:30 Coffee Break</td>
</tr>
<tr>
<td>11:30–13:00</td>
<td><strong>Session Y2: IoT and Networks</strong>&lt;br&gt;Chair: Luis Gomes&lt;br&gt;<strong>IoT Based Targeting System - Airsoft Use-Case</strong>&lt;br&gt;Martim Vieira, João Pedro Matos-Carvalho, Sérgio D. Correia and Rui Tavares&lt;br&gt;<strong>A scalable incremental algorithm for computing the evolution of structural virality in social networks</strong>&lt;br&gt;Rodrigo Calzada Haro, Félix Cuadrado Latasa and Javier Andión Jiménez&lt;br&gt;<strong>Proposal of an IoT Architecture for Greenhouse Monitoring</strong>&lt;br&gt;Victor Lisnic, Filipa Ferrada and Patricia Correia&lt;br&gt;<strong>GloFood: A Community-oriented System for Knowledge Sharing and Collaboration</strong>&lt;br&gt;Pedro Alves, Luís M. Camarinha-Matos and Majid Zamiri&lt;br&gt;<strong>Extending the Synoptics of Things (SoT) Framework to Manage ISoS Technology Landscapes</strong>&lt;br&gt;Bruno Serras, Carlos Gonçalves, Tiago Dias and Luís Osório&lt;br&gt;11:30–13:00 Lunch Break</td>
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<td>13:00–14:30</td>
<td><strong>Session Y3: Measurement and Sensors</strong>&lt;br&gt;Chair: João Murta Pina&lt;br&gt;<strong>Low-Cost Multi-Frequency Eddy Current Coating Thickness Measurement System</strong>&lt;br&gt;Ana C. Santos, André Barrancos, Luís S. Rosado and Fernando M. Janeiro&lt;br&gt;<strong>Preliminary Analysis of Core Losses and Performance of an Axial Flux Motor with High Temperature Superconducting Tapes on the Rotor</strong>&lt;br&gt;João Pinto, Fábio Gregório, Roberto de Oliveira, Xavier Granados and João Murta-Pina&lt;br&gt;<strong>Assessment of a Sonic Sensor for Measuring AC Losses in Superconducting Devices</strong>&lt;br&gt;Ricardo Walker, Diogo Durão, Diogo Dias, Isabel Catarino, João Murta-Pina and Roberto Oliveira&lt;br&gt;<strong>Coverage Characterization of LoRaWAN Sensor Networks for Citrus Orchard Monitoring</strong>&lt;br&gt;Bruno Mendes, Dário Passos and Noélia Correia&lt;br&gt;14:30–15:30 Keynote&lt;br&gt;Sustainable Smart Manufacturing – current reality and future prospect&lt;br&gt;Yang Liu, Linköping University, Sweden</td>
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<td>15:30 – 16:00</td>
<td>Coffee Break</td>
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<td><strong>Chair:</strong> Rui Neves Silva</td>
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<td>16:00-17:30</td>
<td>Session Y4: Control Systems</td>
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<td>Applying Deep Neural Networks to Improve UAV Navigation in Satellite-less Environments</td>
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<td><em>Ricardo Santos, João P. Matos-Carvalho, Slavisa Tomic, Marko Beko and Sérgio D. Correia</em></td>
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<td>Indoor location infrastructure for time management tools: a case study</td>
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<td><em>André Teixeira, Rui Esteves Araújo and Hélder Silva</em></td>
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<td>Simulation and Control of a Cyber-Physical Elevator Prototype</td>
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<td><em>Duarte Santos, Luis Brito Palma and Vasco Brito</em></td>
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<tr>
<td>Irrigation Management System using Artificial Intelligence Algorithms</td>
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<td><em>Gonçalo Mestre, João Pedro Matos Carvalho and Rui Tavares</em></td>
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<td>Adhesion estimation based novel approach to control wheel slip in electric locomotives</td>
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<td><em>Shikha Saini and Ganga Singh Bhawaria</em></td>
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<td>17:30 – 17:45</td>
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<tr>
<td>17:45 – 18:15</td>
<td>Closing Session &amp; Awards</td>
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**Proceedings**

Proceedings of YEF-ECE 2021, including the papers presented at the event, will be proposed to be published by IEEE and included in IEEE Xplore Digital Library.

**Contacts**

DoCEIS Secretariat

NOVA University of Lisbon
School of Science and Technology
Dept. Electrical and Computer Engineering
2829-516 Caparica, Portugal

Tel: (+351) 21 294 85 45
Fax: (+351) 21 294 85 32
Monday - Friday 09:00 a.m. - 06:00 p.m.
Closed Saturday and Sunday

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Program overview

Lisbon / London time zone

Wednesday – 29 Jun 2022

UNINOVA Conference Room

09:00
Opening Session

09:30
Keynote 1

10:30

11:00
A
Smart Systems Thinking

13:00
B
Smart Devices

16:00
C
Cyber-Physical Systems

18:30
Welcome reception

Thursday – 30 Jun 2022

UNINOVA Conference Room

09:00
D
Health-related Digitalization

11:00
E
Control and Digital Platforms

13:00

14:00
Keynote 2

15:30
Panel

Friday – 1 Jul 2022

UNINOVA Conference Room

09:00
F
Electric Systems and Machines

11:00
Y1
Electronics, Networks and Grids

11:30
Y2
IoT and Networks

13:00
Y3
Measurement and Sensors

14:00
Keynote 3

15:30
Posters

16:00
Horizontal Session

17:30
Y4
Control Systems

18:15
Closing Session & Awards