

Program Overview

	Morning	Afternoon
Day 1 7 July	<ul style="list-style-type: none"> ▪ Opening Session ▪ Keynote 1 ▪ Sessions <ul style="list-style-type: none"> A1 Collaborative Networks A2 Intelligent Decision Making I 	<ul style="list-style-type: none"> ▪ Sessions <ul style="list-style-type: none"> B1 CPS and Digital Twins B2 Intelligent Decision Making II ▪ Horizontal Session I ▪ Horizontal Session II
Day 2 8 July	<ul style="list-style-type: none"> ▪ Sessions <ul style="list-style-type: none"> C1 Smart Healthcare Systems C2 Communication and Electronics ▪ Keynote 2 	<ul style="list-style-type: none"> ▪ Sessions <ul style="list-style-type: none"> D1 Classification Systems D2 Smart Energy Management ▪ Panel: <i>"My Research and Applied AI Systems"</i>
Day 3 9 July	<ul style="list-style-type: none"> ▪ Sessions <ul style="list-style-type: none"> E1 Smart Manufacturing Y1.1 YEF-ECE I Y1.2 YEF-ECE I F1 Medical Devices I Y2.1 YEF-ECE II Y2.2 YEF-ECE II 	<ul style="list-style-type: none"> ▪ Keynote 3 ▪ Sessions <ul style="list-style-type: none"> G1 Medical Devices II Y3.1 YEF-ECE III Y3.2 YEF-ECE III ▪ Closing Session & Awards

Detailed Schedule DoCEIS 2021

Day 1 – Wednesday 7 July 2021

10:00 – 10:30 **Opening session (Room: DoCEIS-A)**

10:30 – 11:30 **Keynote 1 (Room: DoCEIS-A)**

Social Robots in the Real World: Current Challenges and Future Directions

Iolanda Leite

Assistant Professor

School of Electrical Engineering and Computer Science

KTH Royal Institute of Technology, Stockholm, Sweden

11:30 – 11:40 **Break**

11:40 – 13:00 **Session A**

A1 – Collaborative Networks (Room: DoCEIS-A)

Chairs: Luis Estrada, Artem Nazarenko

- **AI and Simulation for Performance Assessment in Collaborative Business Ecosystems**
Paula Graça and Luis M. Camarinha-Matos
- **The Benefits of Applying Social Network Analysis to Identify Collaborative Risks**
Marco Nunes and António Abreu
- **A Mixed Method for Assessing the Reliability of Shared Knowledge in Mass Collaborative Learning Community**
Majid Zamiri and Luis M. Camarinha-Matos

A2 – Intelligent Decision Making I (Room: DoCEIS-B)

Chairs: Carlos Marques, Rui Varandas

- **Matheuristic Algorithms for Production Planning in Manufacturing Enterprises**
Eduardo Guzman, Beatriz Andres and Raul Poler
- **Assessment of Sentinel-2 Spectral Features to Estimate Forest Height with the New GEDI Data**
João E. Pereira-Pires, André Mora, Valentine Aubard, João M. N. Silva and José M. Fonseca
- **Assessing Normalization Techniques for TOPSIS Method**
Nazanin Vafaei, Rita A. Ribeiro and Luis M. Camarinha-Matos

13:00 – 14:00 **Lunch Break**

14:00 – 15:00 **Session B**

B1 – Cyber-physical Systems and Digital Twins (Room: DoCEIS-A)

Chairs: Guilherme Brito, Jack Chaplin

- **Verification of the Boundedness Property in a Petri Net-based Specification of the Control Part of Cyber-Physical Systems**
Marcin Wojnakowski and Remigiusz Wiśniewski
- **Collaborative Cyber-Physical Systems Design Approach: Smart Home Use Case**
Artem A. Nazarenko and Luis M. Camarinha-Matos
- **Digital Twin for Supply Chain Master Planning in Zero-Defect Manufacturing**
Julio C. Serrano, Josefa Mula and Raúl Poler

B2 – Intelligent Decision Making II (Room: DoCEIS-B)

Chairs: Ali Gashtasbi, Yulia Berezovskaya

- **How Can e-grocers Use Artificial Intelligence Based on Technology Innovation to Improve Supply Chain Management?**
Mar Vazquez-Noguerol, Carlos Prado-Prado, Shaofeng Liu and Raul Poler
- **A Conceptual Framework of Human-System Interaction Under Uncertainty-Based on Shadow System Perspective**
Qingyu Liang and Juanqiong Gou
- **A New Challenge for Machine Ethics Regarding Decision-Making in Manufacturing Systems**
Esmail Kondori and Rui Neves-Silva

15:00 – 15:10 **Break**

15:10 – 16:10 **Horizontal Session I (Room: DoCEIS-A)**

WLCG Computing and Big Data

João Pina

Computing Researcher at LIP, Lisbon

16:10 - 17:00 **Horizontal Session II (Room: DoCEIS-A)**

Networking Session:

Creative Innovation

Day 2 – Thursday 8 July 2021

10:30 – 11:50

Session C

C1 – Smart Healthcare Systems (Room: DoCEIS-A)

Chairs: João Pires, Esmaeli Kondori

- **Assessment of Visuomotor and Visual Perception Skills in Children: A New Proposal Based on a Systematic Review**
Ana Isabel Ferreira, Carla Quintão and Cláudia Quaresma
 - **Benefits, Implications and Ethical Concerns of Machine Learning Tools serving Mental Health Purposes**
Patricia Gamboa, Cláudia Quaresma, Rui Varandas and Hugo Gamboa
 - **Multi-agent System Architecture for Distributed Home Health Care Information Systems**
Filipe Alves, Ana Maria A. C. Rocha, Ana I. Pereira and Paulo Leitão
- POSTER
- **Long-term unsupervised assessment of mobility in Parkinson’s Disease**
Pedro Ferreira

C2 – Communication and Electronics (Room: DoCEIS-B)

Chairs: Ricardo Martins, Okatakyie Adu-Kankam

- **Detection of Signaling Vulnerabilities in Session Initiation Protocol**
Diogo Pereira and Rodolfo Oliveira
 - **Interference Power Characterization in Directional Networks and Full-Duplex Systems**
Ayman T. Abusabah, Rodolfo Oliveira and Luis Irio
 - **FEM-parameterized Sensorless Vector Control of PMSM Using High-Frequency Voltage Injection**
Gergely Szabó and Károly Veszprémi
- POSTER
- **Memristive devices for neuromorphic applications based on amorphous oxide semiconductor nanoscale films**
Maria E. Pereira, Jonas Deuermeier, Pydi Ganga Bahubalindrani, Pedro Barquinha, Rodrigo Martins, Elvira Fortunato and Asal Kiazadeh

11:50 – 12:00 **Break**

12:00 – 13:00 **Keynote 2 (Room: DoCEIS-A)**

Location privacy from a statistical perspective

George Theodorakopoulos

Senior Lecturer

School of Computer Science and Informatics

Cardiff University, Wales, UK

13:00 – 14:00 **Lunch Break**

14:00 – 15:00 **Session D**

D1 – Classification Systems (Room: DoCEIS-A)

Chairs: Ayman Abu Sabah, Paula Graça

- **Deep Learning-Based Automated Detection of Inappropriate Face Image Attributes for ID Documents**
Amineh Mazandarani, Pedro Miguel Figueiredo Amaral, Paulo da Fonseca Pinto and Seyed Jafar Hosseini Shamoushaki
- **Automatic Cognitive Workload Classification Using Biosignals for Distance Learning Applications**
Rui Varandas, Hugo Gamboa, Inês Silveira, Patrícia Gamboa and Cláudia Quaresma
- **Design of an Attention Tool Using HCI and Work-Related Variables**
Patricia Gamboa, Cláudia Quaresma, Rui Varanda, Helena Canhão, Rute Dinis de Sousa, Ana Rodrigues, Sofia Jacinto, João Rodrigues, Cátia Cepeda and Hugo Gamboa

D2 – Smart Energy Management (Room: DoCEIS-B)

Chairs: Daniel Dias, Nazanin Vafaei

- **Towards a Hybrid Model for The Diffusion of Innovation in Energy Communities**
Kankam O. Adu-Kankam and Luis M. Camarinha-Matos
- **Towards Extension of Data Centre Modelling Toolbox with Parameters Estimation**
Yulia Berezovskaya, Chen-Wei Yang and Valeriy Vyatkin
- **Power Transformer Design Resorting to Metaheuristics Techniques**
Pedro Alves, P. M. Fonte and R. Pereira

“My Research and Applied AI Systems”

Panelists:



Ana Paiva

Full Professor at the Department of Computer Science and Engineering of Instituto Superior Técnico and Research Group Leader at Instituto de Engenharia de Sistemas e Computadores, Investigação e Desenvolvimento em Lisboa.



Luis Paulo Reis

Associate Professor at the University of Porto and President of the Portuguese Association for Artificial Intelligence



Nuno Fachada

Researcher at COPELABS and Assistant Professor at the Universidade Lusófona de Humanidades e Tecnologias



Miguel Cabrira

Chief Financial Office at Enlightenment.AI



Paulo Novais

Professor of Computer Science at the Department of Informatics in the School of Engineering of the University of Minho

Moderator: Pedro Pereira

10:30 – 11:50

Sessions E + YEF-ECE 1

E1 – Smart Manufacturing (Room: DoCEIS-A)

Chairs: Omid Nasrollahi, Amineh Mazandarani

- **Characteristics of Adaptable Control of Production Systems and the Role of Self-Organization Towards Smart Manufacturing**
Luis Alberto Estrada-Jimenez, Sanaz Nikghadam-Hojjati and Jose Barata
- **Predictive Manufacturing: Enabling Technologies, Frameworks and Applications**
Terrin Pulikottil, Luis Alberto Estrada-Jimenez, Sanaz Nikghadam-Hojjati and Jose Barata
- **Control of Manufacturing Systems by HMS / EPS Paradigms Orchestrating I4.0 Components Based on Capabilities**
Jackson T. Veiga, Marcosiris A. O. Pessoa, Fabrício Junqueira, Paulo E. Miyagi and Diolino J. dos Santos Filho
- **A Framework for Self-Configuration in Manufacturing Production Systems**
Hamood Ur Rehman, Jack C. Chaplin, Leszek Zarzycki and Svetan Ratchev

Opening YEF-ECE 2021 (Room: YEF-A)

Y1.1 – Advanced Systems and Services (YEF-ECE 2021) (Room: YEF-A)

Chair: Rodolfo Oliveira

- **A Comparative Study of Microservices Frameworks in IoT Deployments**
Shani du Plessis, Bruno Mendes and Noélia Correia
- **Mathematical Model for Early Diagnosis of Diabetes Mellitus**
Indira Uvaliyeva and Aigerim Ismukhamedova
- **Agent-based simulation of consumer occupancy distribution in shopping centers**
Rui Baptista and Rui Neves-Silva
- **Synoptics of Things (SoT): An Open Framework for the Supervision of IoT Devices**
Bruno Serras, Carlos Gonçalves, Tiago Dias and Luís Osório

Y1.2 – Control Systems (YEF-ECE 2021) (Room: YEF-B)

Chair: Rui Neves da Silva

- **NOVA.DroneArena: design and control of a low-cost drone testbed**
Hugo Cabrita and Bruno Guerreiro
- **Model predictive control strategies for parcel relay manoeuvres using drones**
Francisco Matos and Bruno J. Guerreiro
- **The Use of Bézier Curves for Optimal Motion Planning of Autonomous Vehicles**
Thomas Berry and António Pascoal
- **Integration of Remote Interfaces for Industrial Automation Applications**
Maria da Graça Almeida, Daniel Santiago and Armando Cordeiro

11:50 – 12:00 **Break**

12:00 – 13:00 **Sessions F and YEF-ECE 2**

F1 – Medical Devices I (Room: DoCEIS-A)

Chairs: Pedro Ferreira, Patricia Gamboa

- **Analysis of Electromyography Signals for Control Models of Power-Assisted Stroke Rehabilitation Devices of Upper Limb System**
Paulo Bonifacio, Valentina Vassilenko, Guilherme Marques and Diogo Casal
- **AI-based Classification Algorithm of Infrared Images of Patients with Spinal Disorders**
Anna Poplavska, Valentina Vassilenko, Oleksandr Poplavskiy and Diogo Casal
- **Improvements on Signal Processing Algorithm for the VOPITB Equipment**
Filipa E. Cardoso, Valentina Vassilenko, Arnaldo Batista, Paulo Bonifácio, Sergio Rico Martin, Juan Muñoz-Torrero and Manuel Ortigueira

Y2.1 - Electronics (YEF-ECE 2021) (Room: YEF-A)

Chairs: Luis Oliveira

- **A sub-1V CMOS Instrumentation Amplifier for an AFE Interfacing with Carbon Nanotubes Sensors**
Francisco Neves, João Oliveira and Henrique Oliveira
- **A Reconfigurable Switched-Capacitor DC-DC Step-up Converter Integrated in 130 nm CMOS**
João Gerhardt, Luís Oliveira and Henrique Oliveira
- **Speed Test and Cluster Analysis Processing Method of Hydraulic Mechanism in High-voltage Circuit-Breakers**
Li Wang, Xudong Deng, Liangfeng Guo, Fan Jiang, Jia Chen, Jinsong Xie, Lijiang Chen, Chuan Liu and Xiaojun Yan
- **Analysis and Implementation of a Charge Pump DC-DC Converter**
Marta Gameiro, Luís Oliveira and Henrique Oliveira

Y2.2 – Modelling and Localization (YEF-ECE 2021) (Room: YEF-B)

Chair: José Fonseca

- **Multi-image Super-Resolution Algorithm Supported on Sentinel-2 Satellite Images Geolocation Error**
Miguel Vaqueiro, José Manuel Fonseca, André Mora and Henrique Oliveira
- **Flight Control of Hybrid Drones Towards Enabling Parcel Relay Manoeuvres**
Bruno Neves and Bruno Guerreiro
- **Sensorless Switched Reluctance Machine and Speed Control: A Study to Remove the Position Encoder at High-speed of Operation**
Jonathan V. Costa and Paulo J. C. Branco

13:00 – 14:00 **Break**

14:00 – 15:00

Keynote 3 (Room: DoCEIS-A)

Trusting AI: helping AI make the right decisions and fighting the bad bias

Milos Manic

Professor

Virginia Commonwealth University, USA

Director, VCU Cybersecurity Center (CSeC), NSA CAE-CD, CAE-R

Joint Appt., Idaho National Laboratory (INL)

15:00 – 15:10

Break

15:10 – 16:10

Sessions G + YEF-ECE 3

G1- Medical Devices II (Room: DoCEIS-A)

Chairs: Diyar Fadhil, Filipe Alves

- **Pilot Study for Validation and Differentiation of Alveolar and Esophageal Air**
Paulo Santos, Valentina Vassilenko, Carolina Conduto, Jorge M. Fernandes, Pedro C. Moura, Paulo Bonifácio
- **Application of Machine Learning Methods to Raman Spectroscopy Technique in Dentistry**
Iulian Otel, J. M. Silveira, V. Vassilenko, A. Mata and S. Pessanha
- **Gas Chromatography-Ion Mobility Spectrometry Instrument for Medical Applications: A Calibration Protocol for ppb and ppt Concentration Range**
Jorge M. Fernandes, Valentina Vassilenko, Pedro C. Moura and Viktor Fetter

Y3.1 – Power Electronics (YEF-ECE 2021) (Room: YEF-A)

Chair: João Murta Pina

- **A Multilevel Bidirectional Four-Port DC-DC Converter to Create a DC-Grid in Solid-State Transformers with Hybrid AC/DC Grids**
Vitor Monteiro and Joao Afonso
 - **A Bidirectional Multilevel DC-DC Converter Applied to a Bipolar DC Grid: Analysis of Operation under Fault Conditions**
Cátia F. Oliveira, Vitor Monteiro and João L. Afonso
 - **Wireless Power Transfer System Design and Implementation**
Pedro Lopes, Pedro Costa and Sónia F. Pinto
 - **Simulation analysis of a control system for a Solid-State Transformer**
Mário Jorge Marques and Rui Araújo
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Y3.2 – Systems Modelling and Decision (YEF-ECE 2021) (Room: YEF-B)

Chair: José Barata

- **Constrained-optimization in a 3D bin packing realistic problem**
Yamil Mateo Rodriguez, Juan Carlos Dueñas López and Javier Andión Jiménez
- **Online Model Generation for Scalable Predictive Process Monitoring**
Pedro Rico, Félix Cuadrado and Juan C. Dueñas
- **A heuristic model to identify organizational collaborative critical success factors**
Marco Nunes, Antonio Abreu, Jelena Bagnjuk and Vanessa D'Onofrio
- **Mathematical Modeling of the Interests of Social Network Users**
Zhenisgul Rakhmetullina, Raushan Mukhamedova, Roza Mukasheva and Bolat Batyrkhanov

16:10 – 16:20

Break

16:20 – 16:50

Closing Session & Awards (Room: DoCEIS-A)

Horizontal Session I



João Pina

Computing Researcher

LIP - Laboratório de Instrumentação e Física Experimental de Partículas

Lisbon, Portugal

Title: WLCG Computing and Big Data

Abstract: The Large Hadron Collider (LHC) experiments are located at CERN in Geneva Switzerland and are producing around 90 petabytes of data per year since the beginning of 2010. The data needs to be stored and made available for analysis to more than 12000 researchers spread across the globe. In order to achieve this, the Worldwide LHC Computing Grid (WLCG) project was created which aimed to develop, build, and maintain a global computing facility of more than 170 computing centres spread over 40 countries, linking up national and international grid infrastructures.

Even though WLCG has been operating a distributed computing infrastructure for the past 15 years and currently most of the LHC computing resources are being provided by the classical grid sites, over the last years the LHC experiments have been using more and more public clouds and High-Performance Centers. Till talk will present the past, current, and future challenges of WLCG computing and how to handle one of the most emblematic Big Data challenges of today.

Short Bio: João Pina [M], is a computing researcher at LIP. He has a Ph.D. in Physics with research work in the ATLAS detector at the CERN Large Hadron Collider (LHC). He joined the LIP computing group as a post-doc researcher, to work on grid computing technologies acting as a contact point for the Portuguese LHC community. In 2013 joined the European Grid Infrastructure (EGI) and currently, he is responsible for the coordination of the EGI software stack and liaising between the several international development teams. He also is the Regional Contact Point for the EGI Spanish federation and National Infrastructure Liaison for Portugal. He participated in major e-infrastructure projects like EGI-Inspire and EOSC-Hub as well as in the WLCG and IBERGRID infrastructures. He is currently collaborating with the Portuguese National Distributed Computing Infrastructure (INCD) acting as a technical advisor.

Horizontal Session II

Creative Innovation

Description: In this session participants will be divided in groups and asked to create and give a new life to an existent device, looking into it from a different approach, focusing on its Design, Engineering, AI, Versatility. Then the groups will rejoin and share their work with each other.