

### Day 1 – Wednesday 1 July 2020

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

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

#### **Interpretability, Privacy, and Ethics in Intelligent Systems**

**Catarina Silva**

*Assistant Professor*

*Department of Informatics Engineering*

*University of Coimbra*

*Portugal*

**11:30 – 11:40 Break**

**11:40 – 13:00 Session A**

#### **A1 – Decision Systems (Room: DoCEIS-A)**

*Chairs: Amineh Mazandarani, Paula Graça*

##### **Selecting Normalization Techniques for the Analytical Hierarchy Process**

*Nazanin Vafaei, Rita A. Ribeiro and Luis M. Camarinha-Matos*

##### **ColANet: A UAV Collision Avoidance Dataset**

*Dário Pedro, André Mora, João Carvalho, Fábio Azevedo and José Fonseca*

##### **A Decision-Making Tool to Provide Sustainable Solutions to a Consumer**

*Ricardo Santos, J. C. O. Matias and António Abreu*

##### **A Risk Assessment Model for Decision Making in Innovative Projects**

*Vitor Anes, Luis Reis, Elsa Henriques and António Abreu*

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#### **A2 – Communication Systems (Room: DoCEIS-B)**

*Chairs: Helena Rico Pereira, Omid Nasrollahi*

##### **Cooperative Communication Mechanisms Applied to Wireless Sensor Network**

*Suelen Laurindo, Ricardo Moraes and Carlos Montez*

##### **Probabilistic Network Coding for Reliable Wireless Sensor Networks**

*Eman Al-Hawri, Farooq Al-Tam, Noelia Correia and Alvaro Barradas*

**Joint Channel and Information Estimation on Symbol Decomposition-based Secure Point-to-point Communications**

*Akashkumar Rajaram, David Borges, Paulo Montezuma, Rui Dinis, Dushnatha Nalin K. Jayakody and Marko Beko*

**Self-interference in Multi-tap Channels for Full-Duplex Wireless Systems**

*Ayman T. Abusabah, Rodolfo Oliveira and Luis Irio*

**13:00 – 14:00 Break**

**14:00 – 15:00 Session B**

**B1 – Collaborative Networks (Room: DoCEIS-A)**

*Chairs: Paulo Lourenço, Luis Alberto Estrada*

**Performance Indicators of a Collaborative Business Ecosystem – A Simulation Study**

*Paula Graça and Luis M. Camarinha-Matos*

**Towards a Reference Model for Mass Collaborative Learning**

*Majid Zamiri and Luis M. Camarinha-Matos*

**A Framework for Behavioural Change Through Incentivization in a Collaborative Virtual Power Plant Ecosystem**

*Kankam O. Adu-Kankam and Luis M. Camarinha-Matos*

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**B2 – Energy Control (Room: DoCEIS-B)**

*Chairs: Leonardo Martins, Filipa Cardoso*

**Prospects for the Improvement of Energy Performance in Agroindustry Using Phase Change Materials**

*Carlos Simão, João Murta-Pina, Luís Coelho, João Pássaro, Rui Amaral Lopes, Fernando Reboredo, Tiago Jorge and Diogo Lemos*

**Modeling of Asymmetric Supercapacitor Cells Based on Electrode's Laboratorial Test Data**

*Leonardo Malburg and Rita Pereira*

**Design of a SFCL with an Inductive Stage in Series with a Resistive Stage which Transits by Magnetic Field**

*Belén Rivera, Alfredo Álvarez and Belén Pérez*

**15:00 – 15:10 Break**

**15:10 – 16:10 Session C**

**C1 – Analysis & Synthesis Algorithms (Room: DoCEIS-A)**

*Chairs: Humberto Queiroz, João Pires*

**Reachability Graph of IOPT Petri Net Models Using CUDA C++ Parallel Application**

*Carolina Lagartinho-Oliveira, Filipe Moutinho, and Luís Gomes*

**Automatic Flat-Level Circuit Generation with Genetic Algorithms**

*Miguel Campilho-Gomes, Rui Tavares, and João Goes*

## Towards the Detection of Malicious URL and Domain Names Using Machine Learning

*Nastaran Farhadi Ghalati, Nahid Farhady Ghalaty, and José Barata*

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### **C2 – Power Transportation (Room: DoCEIS-B)**

*Chairs: Ana Ferreira, Kankam O. Adu-Kankam*

#### **Study of Electrical Integrity of Low Voltage Nuclear Power Cables in Case of Plant Life Extension**

*Ehtasham Mustafa, Ramy S. A. Afia, Semih Bal and Zoltán Ádám Tamus*

#### **Investigating the Complex Permittivity of Low Voltage Power Cables Under Different Stresses**

*Ramy S. A. Afia, Ehtasham Mustafa, Semih Bal and Zoltán Ádám Tamus*

#### **Investigation of Power Line Sag Uncertainty in Day-Ahead DLR Forecast Models**

*Levente Rácz, Dávid Szabó, Gábor Göcsei and Bálint Németh*

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| <b>16:10 - 17:00 Tutorial Session (Room: DoCEIS-A)</b> |
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### **Using Energy Flexibility to Improve the Grid Interaction of nearly Zero-Energy Buildings**

**Rui Amaral Lopes**

## **Day 2 – Thursday 2 July 2020**

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| <b>10:30 – 11:50 Session D</b> |
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### **D1 – Digital Twins & Smart Manufacturing (Room: DoCEIS-A)**

*Chairs: Akashkumar Rajaram, Nazanin Vafaei*

#### **The Role of Digital Twins in Collaborative Cyber-Physical Systems**

*Artem A. Nazarenko and Luis M. Camarinha-Matos*

#### **Production Process Modelling Architecture to Support Improved Cyber-Physical Production Systems**

*Fábio A. Seixas-Lopes, Jose Ferreira, Carlos Agostinho and Ricardo Jardim-Goncalves*

#### **The Impact of Additive Manufacturing on Supply Chain Resilience**

*Bardia Naghshineh and Helena Carvalho*

#### **Big Data Acquisition Architecture: An Industry 4.0 Approach**

*Felipe A. Coda, Diolino J. Santos Filho, Fabrício Junqueira and Paulo E. Miyagi*

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### **D2 – Power Systems (Room: DoCEIS-B)**

*Chairs: Hugo Antunes, Sonia Hosseinpour*

#### **Study of Electric Field Emissions in Wireless Energy Transfer**

*Elena N. Baikova, R. Melicio, and S. S. Valtchev*

#### **Scenario Reduction for Stochastic Optimization Applied to Short-Term Trading of PV Power**

*Isaias L. R. Gomes, Rui Melicio, and Victor M. F. Mendes*

## **Model Predictive Current Control of Switched Reluctance Motor Drive: An Initial Study**

*Manuel Pereira and Rui Esteves Araújo*

## **A Simple Analysis to Determine the Limits of a CMOS Technology to Implement SC DC-DC Converters**

*Ricardo Madeira and Nuno Paulino*

**11:50 – 12:00 Break**

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

### **Activities of Daily Life (ADL) Recognition via Locomotion & Location Determination**

**Stefan Poslad**

*Associate Professor*

*School of Electronic Engineering and Computer Science*

*Queen Mary University of London*

*England*

**13:00 – 14:00 Break**

**14:00 – 15:00 Session E**

### **E1 – Optimization Systems (Room: DoCEIS-A)**

*Chairs: Carolina Lagartinho-Oliveira, Nastaran Farhadi Ghalati*

#### **Distributed Approach to Traffic Management Automation Implemented according to IEC 61499**

*Dmitry Elkin and Valeriy Vyatkin*

#### **Formal Verification of IEC 61499 Enhanced with Timed Events**

*Viktor Shatrov and Valeriy Vyatkin*

#### **Thin Film Refractive Index and Thickness**

*Paulo Lourenço, Manuela Vieira and Alessandro Fantoni*

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### **E2 – Biomedical Analysis & Diagnosis (Room: DoCEIS-B)**

*Chairs: Dario Pedro, Fabio A. Seixas Lopes*

#### **Combination of Medical Imaging and Demographic Data for Parkinson's Disease Diagnosis**

*Helena Rico Pereira, José Manuel Fonseca and Hugo Alexandre Ferreira*

#### **Ventricular Assist Device in Health 4.0 Context**

*Marcelo Barboza, Fabricio Junqueira, Eduardo Bock, Tarcisio Leão, Jeferson Dias, Jonatas Dias, Marcosiris Pessoa, José Ricardo Souza and Diolino dos Santos*

#### **RehabVisual: Application on Subjects with Stroke**

*Ana Ferreira, Patrícia Santos, Pedro Dias, Amélia Alves, Beatriz Carmo, Filipe Vilhena, Sofia Costa, Cláudia Quaresma and Carla Quintão*

**"My Research for Life Improvement"**



**Hugo Gamboa**

*Assistant Professor at Department of Physics  
FCT NOVA*



**Inês Oliveira**

*Assistant Professor at Department of Electrical and Computer Engineering  
FCT NOVA*



**André Mora**

*Assistant Professor at Department of Electrical and Computer Engineering  
FCT NOVA*



**Maria Marques**

*Researcher at CTS UNINOVA*



**João Pires**

*PhD Student at Department of Electrical and Computer Engineering  
FCT NOVA*



**João Rodrigues**

*PhD Student at Department of Physics  
FCT NOVA*

**Moderator: Pedro Pereira**

**Day 3 – Friday 3 July 2020**

**F1 – Instrumentation & Health 1 (Room: DoCEIS-A)**

*Chairs: Ricardo Madeira, David Borges*

**Algorithm for Automatic Peak Detection and Quantification for GC-IMS Spectra**

*Jorge M. Fernandes, Valentina Vassilenko and Paulo H. Santos*

### **Algorithm for Automated Segmentation and Feature Extraction of Thermal Images**

*Anna A. Poplavska, Valentina B. Vassilenko, Oleksandr A. Poplavskiy, Sergei V. Pavlov and Fernando M. Pimentel-Santos*

### **Development and Validation of an Experimental Protocol to Evaluate Posture Control**

*Daniel Noronha Osório, Emanuela Teixeira, Fernando Pimentel-Santos, Hugo Silva, Hugo Gamboa and Cláudia Quaresma*

### **A Genetic Algorithm to Design Job Rotation Schedules with Low Risk Exposure**

*João Rodrigues, Hugo Gamboa, Nafiseh Mollaei, Daniel Osório, Ana Assunção, Carlos Fajão and Filomena Carnide*

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## **Opening YEF-ECE 2020 (Room: YEF-ECE)**

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### **Y1 – Image Processing (YEF-ECE 2020) (Room: YEF-ECE)**

*Chairs: André Mora*

#### **Pixel-based and object-based change detection methods for assessing fuel break maintenance**

*João E. Pereira-Pires, Valentine Aubard, João M. N. Silva, Rita A. Ribeiro, José M. C. Pereira, José Manuel Fonseca, Manuel L. Campagnolo and André Mora*

#### **FPGA-based Satellite Image Classification for Water Bodies Detection**

*Carlos Garcia, Rui Tavares, André Mora, José Fonseca, Henrique Oliveira and Luís Oliveira*

#### **Infrared Fire Alarm for Vehicle Protection**

*José Curva, Nuno Paulino, João Pedro Oliveira, Luís Oliveira and Henrique Oliveira*

#### **Assessment of Using Superconducting Magnetic Energy Storage for Current Harmonic Compensation**

*Francisco Luís Simões, Victor Fernão Pires and João Murta Pina*

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| <b>11:50 – 12:00 Break</b> |
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| <b>12:00 – 13:00 Keynote 3 (Room: DoCEIS-A)</b> |
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### **Trends in Renewable Energy Integration in Smart Grids**

**Theo Tryfonas**

*Associate Professor*

*University of Bristol*

*England*

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| <b>13:00 – 14:00 Break</b> |
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| <b>14:00 – 15:00 Sessions G and Y</b> |
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### **G1 – Instrumentation & Health 2 (Room: DoCEIS-A)**

*Chairs: Pedro C. Moura, Anna A. Poplavska*

#### **Real Time Mental Stress Detection through Breath Analysis**

*Paulo Santos, Peter Roth, Jorge M. Fernandes, Viktor Fetter and Valentina Vassilenko*

## **Multi-Sensor Synchronization Model for Sensor Fusion Applied to Innovative Cardiovascular Markers**

*Paulo Bonifacio, Valentina Vassilenko, Andreia Serrano, Filipa Cardoso and Stanimir Valtchev*

## **Device Development for Evaluation of Gingiva Microcirculation**

*Hojat Lotfi, Valentina Vassilenko, Paulo Bonifacio and Bibiana Falcao*

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### **Y2 – Power Electronics (YEF-ECE 2020) (Room: YEF-ECE)**

*Chairs: Anabela Pronto*

#### **A Novel Topology of Modular Multilevel Bidirectional Non-Isolated dc-dc Converter**

*Vitor Monteiro*

#### **Modular Multilevel Converter in Electrified Railway Systems: Applications of Rail Static Frequency Converters and Rail Power Conditioners**

*Mohamed Tanta, Luis Barros, Gabriel Pinto, Antonio Martins and João Afonso*

#### **Power-Train ECU programming using Rapid Prototyping through Matlab/Simulink**

*Carmen Romero-Saiz, María Isabel Milanés-Montero, Enrique Romero-Cadaval and Jaime Pando-Acedo*

#### **Fault Diagnosis in DC-DC Power Converters Based on Parity Equations**

*Willer Jorge Mattos and Rui Araújo*

#### **Grid-Connected PV System Using a T Type qZS Inverter with an Integral Time Derivative Approach to Ensure MPP and Decoupled Current Control**

*Manuel Pina and Vitor Pires*

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| <b>15:00 – 15:10 Break</b> |
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| <b>15:10 – 16:10 Sessions H + Y</b> |
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### **H1 – Instrumentation & Health 3 (Room: DoCEIS-A)**

*Chairs: Leonardo Malburg, Ricardo Santos*

#### **Arterial Stiffness and Central Hemodynamic Assessment by Novel Portable Device**

*Andreia Serrano, Valentina Vassilenko, Beatriz Ramalho, Paulo Bonifácio and Anna Poplavska*

#### **Indoor & Outdoor Air Profiling with GC-IMS**

*Pedro C. Moura, Valentina Vassilenko, Jorge M. Fernandes and Paulo H. Santos*

#### **Idle Tone Detection in Biomedical Signals Using Time-Frequency Techniques**

*Filipa E. Cardoso, Arnaldo Batista, Valentina Vassilenko, Andreia Serrano and Manuel Ortigueira*

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### **Y3 – Industry & Buildings (YEF-ECE 2020) (Room: YEF-ECE)**

*Chairs: André Rocha*

#### **A New Risk Assessment and Management Approach for Agile Projects**

*Vitor Anes, António Abreu and Ricardo Santos*

### **Industrial Network Topology Generation with Genetic Algorithms**

*Christoph Fischer, Maximilian Berndt, Dennis Krummacker, Janis Zemitis, Daniel Fraunholz and Hans Dieter Schotten*

### **Forecasting Heating and Cooling Energy Demand in an Office Building using Machine Learning Methods**

*Xavier Godinho, Hermano Bernardo, Joao C. Sousa and Filipe Oliveira*

### **Demand Response Model for Hardware Implementation**

*Bruno Capitão, João Lagarto, Rita Pereira, Pedro Fonte and Paulo Almeida*

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| <b>16:10 – 16:20 Break</b> |
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| <b>16:20 – 16:50 Closing Session &amp; Awards (Room: DoCEIS-A)</b> |
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