



# 9th Advanced Doctoral Conference on Computing, Electrical and Industrial Systems



Including the associated event  
YEF-ECE 2018  
Young Engineers Forum on Electrical and Computer  
Engineering

## Technological Innovation for Resilient Systems

May 02-04, Caparica - Portugal

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## Welcome Message

The ninth edition of the Advanced Doctoral Conference on Computing, Electrical and Industrial Systems, **DoCEIS 2018**, aims at bringing together PhD students, researchers, and engineers from all over the world, interested in innovative ideas and techniques around the development and application of **Resilient Systems**. Rapid evolution in Sensing Technology, Actuators, and Embedded Intelligence Technology and its seamless integration into multiple Systems Architecture and Platforms has revolutionized the technological world, and even the way we live, since the last decade. However, the pervasive nature of these technologies, coupled with increased rate of disruptive events around the globe such as: globalization, natural hazards and climate change, economic crisis, demographic shifts, fast technological evolution, cyber-attacks, rise of nationalisms and many more, has increased the world's vulnerability in diverse ways and forms. Therefore, the idea of integrating resilience into all facets and levels of engineering disciplines has become eminent and is rapidly gaining attention and focus not only within the academic circles and research communities worldwide, but also in the practical applications development. Potential benefits of resilient systems can enhance all engineering fields and at all levels, e.g. enhancing systems-of-systems, securing the industrial Internet, Industry 4.0, and networked enterprises, enabling more agile smart energy grids, ensuring good basis for smart environments, etc. A "Resilient System" approach can change the way engineering systems are conceptualized, designed and operated while leading to exciting challenges for researchers and industrial practitioners.

The key objective of the DoCEIS advanced doctoral conference is to create a space for sharing and discussing ideas and results from doctoral research in these inter-related areas of engineering. Innovative ideas and hypotheses can be better enhanced when presented and discussed in an encouraging and open environment. DoCEIS is designed to provide such an environment, releasing PhD students from the pressure of presenting their propositions in more formal contexts.

Although most PhD students still lack research experience, being in the process of learning how to do research, a number of empiric studies also show that a high number of technological innovation ideas are produced in the early careers of researchers. The combination of the eagerness to try new approaches and directions of young doctoral students with the experience and broad knowledge of their supervisors is likely to result in an important pool of innovation potential, with strong economic impact, being important that a **multi-disciplinary and interdisciplinary perspective** becomes an intrinsic part of the doctoral programs. DoCEIS aims at facilitating such dialog among disciplines, opening new perspectives to young researchers.

This edition of DoCEIS, which is sponsored by SOCOLNET, IFIP and IEEE Industrial Electronics Society, attracted a good number of paper submissions from a good number of PhD students (and their supervisors) from 21 countries. The selected papers correspond to an acceptance rate of 45.6%. I am particularly thankful to all of you that contributed with your high-quality work and therefore 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 that carried the heavy task of evaluating all submissions.

This year we are pleased to also repeat, as an associated event, the **YEF-ECE 2018 2<sup>nd</sup>** International Young Engineers Forum on Electrical and Computer Engineering, which attracted submissions from 16 countries and has an acceptance rate of 45.5%.

I wish you all a great conference in Costa da Caparica and invite you to play a very active role in all sessions.

*Prof. Luis M. Camarinha-Matos*  
*Conference Chairman*

## Message from the Organizers

Hello, and welcome to DoCEIS'18!

We hope that you enjoy this ninth edition of the Advanced Doctoral Conference on Computing, Electrical and Industrial Systems, held at Caparica, Portugal. This conference is organized in the context of the Electrical Engineering doctoral programme of the Faculty of Sciences and Technology of NOVA University of Lisbon. Most of the local organizers that you will meet are PhD students or candidates from this programme. For us, co-organizing and being involved in all aspects of the conference, from program definition, dissemination, venue, sponsorship etc., has been exciting, but quite a challenge, more importantly a very enriching experience which will accompany us in our future careers.

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 this conference. To the International Program Committee, our appreciation for all the hard work in the reviewing process.

Our objective at DoCEIS is to continuously provide a rich scientific programme and especially an open atmosphere for sharing experiences and knowledge among all participants. We had submissions from 21 countries, making this an opportunity for expanding scientific networks, with people from similar fields of research and interests and for exploring new domains of application. Please feel free to engage in conversations and knowledge exchanges during the various events that have been organized. We expect that the social events will also be a chance to break the ice and find new and fruitful friendships and future collaborations.

Wishing everyone a very pleasant and rewarding conference - may DoCEIS'18 be a positively memorable event!

*The Local Organizers.*

# DoCEIS 2018 Conference Organisation

## Conference and Program Chair:

Luis M. Camarinha-Matos, Portugal

## Organizing Committee Co-chairs:

Luis Gomes, Portugal

João Goes, Portugal

Pedro Pereira, Portugal

## International Program Committee

Vanja Ambrozic, Slovenia

Amir Assadi, USA

Ezio Bartocci, Austria

Olga Battaia, France

Marko Beko, Portugal

Luis Bernardo, Portugal

Nik Bessis, UK

Andrea Bottino, Italy

Erik Bruun, Denmark

Barbora Buhnova, Czech Republic

Giuseppe Buja, Italy

Luis M. Camarinha-Matos, Portugal

Laura Carnevali, Italy

Wojciech Cellary, Poland

Noelia Correia, Portugal

Luis M. Correia, Portugal

Jose de la Rosa, Spain

Stefano Di Carlo, Italy

Dirk Dirk Lehmkus, Germany

Ruggero Donida Labati, Italy

Florin G. Filip, Romania

Maria Helena Fino, Portugal

José M. Fonseca, Portugal

Diego Gachet, Spain

Adriana Giret, Spain

João Goes, Portugal

Luis Gomes, Portugal

Antoni Grau, Spain

Paul Grefen, Netherlands

Michael Huebner, Germany

Oleksandr Husev, Estonia

José Igreja, Portugal

Ricardo Jardim-Gonçalves, Portugal

Vladimir Katic, Serbia

Asal Kiazadeh, Portugal

Hans-Jörg Kreowski, Germany

Zbigniew Leonowicz, Poland

Marin Lujak, France

João Martins, Portugal

Rui Melicio, Portugal

Paulo Miyagi, Brazil

Renato Moraes, Brazil

Filipe Moutinho, Portugal

Horacio Neto, Portugal

Rodolfo Oliveira, Portugal

Luis Oliveira, Portugal

Eugenio Oliveira, Portugal

Angel Ortiz, Spain

Gordana Ostojic, Netherlands

Peter Palensky, Austria

Luis Palma, Portugal

Nuno Paulino, Portugal

Pedro Pereira, Portugal

Duc Pham, UK

João Pimentão, Portugal

Paulo Pinto, Portugal  
Armando Pires, Portugal  
Ricardo J. Rabelo, Brazil  
Rita Ribeiro, Portugal  
Juan Rodriguez-Andina, Spain  
Enrique Romero-Cadaval, Spain  
Carlos Roncero, Spain  
Thilo Sauter, Austria  
Eduard Shevtshenko, Estonia

Pierluigi Siano, Italy  
Thomas Strasser, Austria  
Damien Trentesaux, France  
Antonios Tsourdos, UK  
Manuela Vieira, Portugal  
Ramon Vilanova, Spain  
Soufi Youcef, France  
Ahmed F. Zobaa, UK  
Tamus Zoltán Ádám, Hungary

### **Organizing Committee (PhD Students)**

Kankam O. Adu-Kankam, Ghana  
Andreia Artifice, Portugal  
Koorosh Aslansefat, Iran  
Adriana Jesus, Portugal  
Mohammad Julashokri, Iran  
Paulo Lourenço, Portugal  
Ricardo Madeira, Portugal

### **Impact and Dissemination Task Force**

Filipe Moutinho, Portugal  
Rodolfo Oliveira, Portugal  
Luis Palma, Portugal

## Conference Venue & Activities

The conference will be held at "Hotel Aldeia dos Capuchos" in Caparica, south of Lisbon, the capital of Portugal. Lisbon is an illuminated city. The almost constant presence of sunshine and the River Tagus transforms the Portuguese capital into a mirror of a thousand colours - highlighting the city's unique architecture and beauty. There are so many things to see and do in Lisbon that visitors have access to a wide array of different experiences.

### Address:

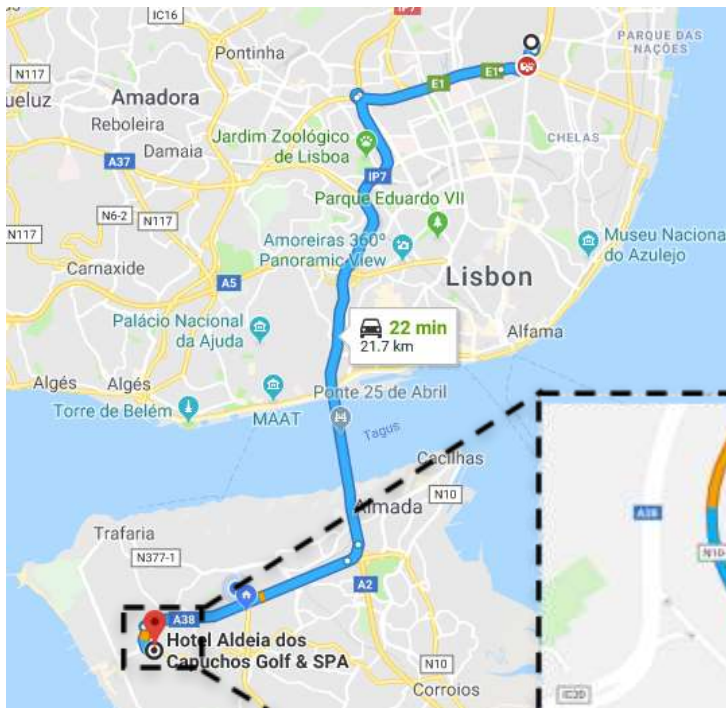
Largo Aldeia dos Capuchos, 2825-017 Caparica,  
Almada - Portugal, Tel: (351) 212 909 000 - Fax: (351) 212 909 009

**E-mail:** melia.capuchos@meliaportugal.com

**WWW:** <http://www.aldeiadoscapuchos.pt/hotel-overview.html>



### How to get there (from Lisbon Airport)



**By Taxi:** During the day, it should cost roughly 30 €. Please be aware that you only pay what is marked, which includes luggage, plus toll back to Lisbon (1.75 €). During the night, it should cost roughly 40 €. Taxis have meters so make sure the driver is using it. There is an initial flag-fall or bandeirada charge and then a charge for the distance covered. Taxis are also more expensive at night (usually 10pm-6am), weekends and public holidays and charge for luggage carried in the trunk (boot).

It is slightly more expensive if you phone for a pick one up on the street.



taxi than

**By Public Transportation:** The Aerobus (Bus Carris nº 91) leaves every 20 minutes, from 7.00 to 23.00. It goes to "Cais do Sodré" (Sodré's Quay) where there are boats to Cacilhas. The boat's Company is "[Transtejo](http://www.transtejo.pt)"

For more possible options visit: <http://transporlis.sapo.pt>

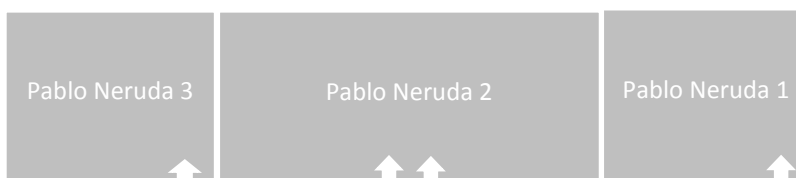


## Conference Rooms

The conference will take place at the second level floor of the “Aldeia dos Capuchos Golf & SPA Hotel”. This hotel is located at the entrance of the historical Vila dos Capuchos, known for its unique character and the majestic presence of the Convent which, itself, is a magnificent belvedere overlooking the sea. The hotel is surrounded by an extensive green area, where the golf course stands out and where the guests can find excellent running tracks.

The conference has a total of three rooms:

- Room Pablo Neruda 1
- Room Pablo Neruda 2
- Room Pablo Neruda 3



2nd Level

The **registration desk of the Conference** will be held at room “**Pablo Neruda 2**”. **Opening Session, Keynote Sessions 1, 2 and 3, Horizontal Topics 1, 2 and 3, Tutorial Sessions 1 and 3, Panel Session** and sessions A<sub>1</sub>, B<sub>1</sub>, C<sub>1</sub>, D<sub>1</sub>, E<sub>1</sub> and F<sub>1</sub>, will take place in room “**Pablo Neruda 2**”. Sessions A<sub>2</sub>, B<sub>2</sub>, C<sub>2</sub>, D<sub>2</sub>, Y<sub>2</sub> and Y<sub>4</sub> will take place in room “**Pablo Neruda 1**” and the “**Pablo Neruda 3**” room will be used for the sessions Y<sub>1</sub> and Y<sub>3</sub>.

**Lunches** are included in the registration fee, as well, as the Welcome Reception and Conference Dinner.





**Coffee-breaks** will be held at the hotel’s main lobby (bellow picture), whereas **Lunches** will take place at the “Al-Madan Restaurant” with its beautiful outdoors balcony (above picture) looking over the swimming pool (access to the balcony area might need prior agreement with the hotel).





# Social Events Venues



## Welcome Reception



🕒 19:00 to 21:00


🚶 Within walking distance (approx. 550 m).

## Conference Dinner



🕒 19:30 to 23:00

🚌 A Chartered Bus will be leaving the Hotel at 19:30 and returning at 23:00.



## Invited Speakers



**Keynote 1: Professor Laura Ricci**, University of Pisa, Italy

**Title:** Blockchains Beyond Cryptocurrencies

**Short Bio:** *Laura Ricci is an Associate Professor of the Department of Computer Science, University of Pisa. She received her diploma in Computer Science and her PhD from University of Pisa where she currently teaches several courses in the area of Computer Networks. Her main research interests are in the field of distributed computing, in particular P2P, blockchains and data intensive computing. She is the co-chair of the Large Scale Distributed Virtual Environments, LSDVE, workshop series, held every year in conjunction with EUROPAR. She has been the guest editor of several special issues in international journals and has chaired several workshops in International Conferences. Laura Ricci is author of more than 120 papers*

*published in in refereed journals, books and international conference proceedings.*

**Abstract:** Blockchain technology has been initially successfully applied to digital currencies, to achieve a tamper-free distributed ledger that securely stores all the transactions. The basic technology underlying Bitcoin is now attracting more and more attention all over the world and in fields that strongly differ from that of cryptocurrencies. The possibility of defining a distributed reliable memory that can store events without a trusted authority or a central server, has led to the development of several blockchain-based applications, like identity management, supply chains, Internet of Things, edge computing, social networking, crowdsourcing, Cyber Physical Systems, e-voting and so on. The talk introduces the basic concepts of blockchain technology, i.e. basic cryptographic tools, consensus and data structures, in the Bitcoin and Ethereum context. Then, it will be shown how important problem such as scalability, privacy, efficiency, and flexibility can be addressed. Finally, several applications of blockchains will be presented



**Keynote 2: Professor Kay Römer**, TU Graz, Austria,

**Title:** Dependable Internet of Things

**Short Bio:** *Kay Römer is professor at and director of the Institute for Technical Informatics, as well as head of the Field of Expertise "Information, Communication & Computing" at TU Graz, Austria. He obtained his doctorate in computer science from ETH Zurich in 2005 with a thesis on wireless sensor networks. As a senior researcher, he led the sensor network-related research activities of the Distributed Systems Group at ETH Zurich between 2005 and 2009. From 2009 to 2013 he held a professorship at University of Lübeck in Germany. Kay Römer is an internationally recognized expert on networked embedded systems, with research focus on*

*wireless networking, fundamental services, operating systems, programming models, dependability, testbeds, and deployment methodology. He was the scientific coordinator of the EU FP7 FIRE project RELYonIT on dependable networking in the Internet of Things. He is currently the coordinator of the TU Graz Research Center "Dependable Internet of Things".*

**Abstract:** Wireless networked embedded systems are increasingly used for safety-critical applications. Even in harsh environments and under deliberate attacks these systems must continue to operate correctly, which requires resilience - and more generally - dependability properties. In this talk we present recent research results obtained at the Dependable Things research center at TU Graz. Specifically, we will introduce methods to improve the dependability of wireless communication and localization, to improve the security of embedded computing, and to verify the correctness and interoperability of communication protocols used in the Internet of Things.



**Keynote 3: Professor Zita Vale**, Polytechnic Institute of Porto, Portugal

**Title:** Enabling efficient management of distributed energy resources in the context of smart grids: A cognitive and multi-Agent based approach

**Short Bio:** *Zita Vale is full professor at the Polytechnic Institute of Porto and the director of the Research Group on Intelligent Engineering and Computing for Advanced Innovation and Development (GECAD). She received her diploma in Electrical Engineering in 1986 and her PhD in 1993, both from University of Porto.*

*She has been involved in more than 50 funded projects involving the development and use of Knowledge-Based systems, Multi-Agent systems, Genetic Algorithms, Neural networks, Particle Swarm Intelligence, Constraint Logic Programming and Data Mining. Most of these projects concern several aspects of smart grids, network operation and electricity markets. Energy resources management, distributed generation, demand response and electric vehicles are important topics of her research in the current projects.*

**Abstract:** The talk addresses the current and envisioned options for the management of distributed energy resources in smart grids. Artificial intelligence-based approaches bring important new possibilities enabling the efficient individual and aggregated management of those resources in the frame of a market-driven environment. MARTINE (Multi-Agent based Real-Time INfrastructure for Energy), a platform to support real-time energy management and simulation of buildings and smart grids, will be described and used as the basis to present different data-driven and cognitive applications.

## Preliminary Program Overview

	Morning	Afternoon
<b>Day1</b> 2 May	<ul style="list-style-type: none"> <li>▪ Registration</li> <li>▪ Opening Session</li> <li>▪ <b>Keynote 1</b></li> <li>▪ <b>Sessions/Poster</b> <ul style="list-style-type: none"> <li>A1 Collaborative Systems</li> <li>A2 Electrical Systems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Horizontal topic 1</b></li> <li>▪ <b>Sessions</b> <ul style="list-style-type: none"> <li>B1 Supervision Systems</li> <li>B2 Energy Management</li> </ul> </li> <li>▪ <b>Tutorial session 1</b></li> <li>▪ <b>Tutorial session 2</b></li> <li>▪ Welcome Reception</li> </ul>
<b>Day2</b> 3 May	<ul style="list-style-type: none"> <li>▪ <b>Sessions</b> <ul style="list-style-type: none"> <li>C1 Smart Grid</li> <li>C2 Monitoring Systems</li> </ul> </li> <li>▪ <b>Keynote 2</b></li> <li>▪ <b>Horizontal topic 2</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Horizontal topic 3</b></li> <li>▪ <b>Horizontal topic 4</b></li> <li>▪ <b>Sessions</b> <ul style="list-style-type: none"> <li>D1 Decision Support Systems</li> <li>D2 Simulation and Analysis</li> </ul> </li> <li>▪ <b>Panel session</b></li> <li>▪ <b>Conference dinner</b></li> </ul>
<b>Day3</b> 4 May	<ul style="list-style-type: none"> <li>▪ <b>Sessions</b> <ul style="list-style-type: none"> <li>E1 Sensing Systems</li> <li>Y1 Computing Systems</li> <li>Y2 Energy Management</li> </ul> </li> <li>▪ <b>Keynote 3</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Tutorial session 3</b></li> <li>▪ <b>Tutorial session 4</b></li> <li>▪ <b>Sessions</b> <ul style="list-style-type: none"> <li>F1 Energy Distribution Systems</li> <li>Y3 Networks</li> <li>Y4 Control &amp; Energy</li> </ul> </li> <li>▪ <b>Closing and Awards</b></li> </ul>

# Detailed Schedule DoCEIS'18

Wednesday, May 02, 2018

	Session Title
08:00 – 09:00 Pablo Neruda 2	<b>Registration</b>
09:00 – 09:30 Pablo Neruda 2	<b>Opening Session</b>
09:30 – 10:30 Pablo Neruda 2	<b>Keynote 1</b> Blockchains Beyond Cryptocurrencies <i>Laura Ricci</i>
10:30 – 11:00	<b>Coffee Break</b>
11:00 – 12:30 Session A1: <b>Collaborative Systems</b>  Pablo Neruda 2	<b>Chairs:</b> Javaneh Ramezani, Collen Masilo  Learning Through Mass Collaboration - Issues and Challenges <i>Majid Zamiri, Luis M. Camarinha-Matos</i>  Semantic Modelling of User Interactions in Virtual Reality Environments <i>Jacek Sokolowski, Krzysztof Walczak</i>  Towards Collaborative Virtual Power Plants <i>Kankam O. Adu-Kankam and Luis M. Camarinha-Matos</i>  <b>Poster Session</b> Virtual Embodied Agent for Attention Improvement in eLearning <i>Andreia Artifice, João Sarraipa and Ricardo Jardim-Gonçalves</i> The Use of Cooperative NZEB Communities to Improve the Grid Resilience <i>Adriana Mar, Pedro Pereira and João Martins</i>
11:00 – 12:30 Session A2: <b>Electrical Systems</b>  Pablo Neruda 1	<b>Chairs:</b> José Lima de Oliveira, Paulo Lourenço  Experimental Set-up for an IoT Power Supply with an 130nm SC DC-DC Converter <i>Ricardo Madeira, Nuno Correia, João P. Oliveira, and Nuno Paulino</i>  Wireless Battery Charger for EV with Circular or Planar Coils: Comparison <i>L. Romba, E. Baikova, C. Borges, R. Melicio, S. S. Valtchev</i>  An Outline of Fault-Tolerant Control System for Electric Vehicles Operating in a Platoon <i>António Lopes and Rui Esteves Araújo</i>
12:30 – 13:45	<b>Lunch</b>
13:45 – 15:00 Pablo Neruda 2	<b>Horizontal Topic 1:</b> Communicating Science Visually <i>Marco Neves</i>
15:00 – 16:30  Session B1:	<b>Chairs:</b> Thais Baldissera, Mohammad Julashokri  Resilience Supported System for Innovative Water Monitoring Technology <i>Koorosh Aslansefat, Mohammad Hossein Ghodsirad, José Barata, Javad Jassbi</i>  Modelling Cyber Physical Social Systems Using Dynamic Time Petri Nets <i>Shabnam Pasandideh, Luis Gomes, Pedro Maló</i>



<b>Supervision Systems</b> Pablo Neruda 2	Supervisory Control System Associated with the Development of Device Thrombosis in VAD <i>José R. Sousa Sobrinho, Edinei Legaspe, Evandro Drigo, Jônatas C. Dia, Jeferson C. Dias, Marcelo Barboza, Paulo E. Miyagi, Jun Okamoto Jr, Fabrício Junqueira, Eduardo Bock, Diolino J Santos Filho</i>
15:00– 16:30	<b>Chairs:</b> Adriana Jesus, Fernando Monteiro
Session B2: <b>Energy Management</b> Pablo Neruda 1	Wind-PV-Thermal Power Aggregator in Electricity Market <i>I. L. R. Gomes R. Laia, H. M. I. Pousinho, R. Melicio, V. M. F. Mendes</i>
	Quantifying Potential Benefits from Flexible Household Storage Load <i>Beata Polgari, David Raisz, Daniel Divenyi</i>
	Energy Efficiency in Buildings by Using Evolutionary Algorithms: An Approach to Provide Efficiency Choices to the Consumer, Considering the Rebound Effect <i>Ricardo Santos, J.C.O. Matias, Antonio Abreu</i>
16:30 – 17:00	Coffee Break
17:00 – 18:30 Pablo Neruda 2	<b>Tutorial Session 1:</b> <b>Electricity Markets &amp; Intelligent Agents</b> <i>Fernando Lopes, Hugo Algarvio</i>
17:00 – 18:30 Pablo Neruda 1	<b>Tutorial Session 2:</b> <b>Wireless Architectures for the IoT</b> <i>Luis Bernardo, Rodolfo Oliveira</i>
19:00	Welcome Reception

## Thursday, May 03, 2018

	Session Title
9:00 – 10:30 Session C1: <b>Smart Grids</b> Pablo Neruda 2	<b>Chairs:</b> Ricardo Madeira, José Lima de Oliveira
	The Use of Smart Grids to Increase the Resilience of Brazilian Power Sector to Climate Change Effects <i>Débora de São José, J. Nuno Fidalgo</i>
	High-Frequency Transformer Isolated AC-DC Converter for Resilient Low Voltage DC Residential Grids <i>Nelson Santos, J. Fernando Silva, Vasco Soares</i>
	Analysis of Domestic Prosumer Influence on a Smart grid <i>João Carvalhuço, R. Pereira, P.M. Fonte</i>
9:00 – 10:30 Session C2: <b>Monitoring Systems</b> Pablo Neruda 1	<b>Chairs:</b> Koorosh Aslansefat, Artem Nazarenko
	Monitoring of Actual Thermal Condition of High Voltage Overhead Lines <i>Balint G. Halász, Bálint Németh, Levente Rác, Dávid Szabó, Gábor Göcsei,</i>
	Resilient Energy Harvesting System for Independent Monitoring Nodes <i>Alberto Gutiérrez-Martínez, Enrique Romero-Cadaval</i>
	Development and Testing of Remotely Operated Vehicle for Inspection of Offshore Renewable Devices <i>Romano Capocci, Edin Omerdic, Gerard Dooly, Daniel Toal</i>
10:30 – 11:00	Coffee Break

11:00– 12:00 Pablo Neruda 2	<b>Keynote 2</b> Dependable Internet of Things <i>Kay Römer</i>
12:00 – 13:00 Pablo Neruda 2	<b>Horizontal Topic 2:</b> Design Thinking <i>Guilherme Victorino</i>
13:00– 14:15	Lunch
14:15 – 15:15 Pablo Neruda 2	Horizontal Topic 3: Finishing My PhD: The Next 90 Days <i>Joana Marques</i>
14:15 – 15:15 Pablo Neruda 1	<b>Horizontal Topic 4:</b> Leadership <i>Pedro Sousa</i>
15:15 – 16:45 Session D1: <b>Decision Support Systems</b>  Pablo Neruda 2	<i>Chairs:</i> Kankam Adu-Kankam, Ricardo Almeida Selection of Normalization Technique for Weighted Average Multi-Criteria Decision Making <i>Nazanin Vafaei, Rita A. Ribeiro, Luis M. Camarinha-Matos</i> Residence Efficiency Based on Smart Energy Systems <i>André Monteiro, R. Pereira, F. A. Barata</i> Next Day Load Forecast: A Case Study for the City of Lisbon <i>Svetlana Chemetova, Paulo Santos and Mário Ventim-Neves</i>
15:15 – 16:45 Session D2: <b>Simulation and Analysis</b>  Pablo Neruda 1	<i>Chairs:</i> David Borges, Nuno Correia Systemic Model of Cardiac Simulation with Ventricular Assist Device for Medical Decision Support <i>Jônatas C. Dias, Jeferson C. Dias, Marcelo Barboza, José R. Sousa Sobrinho, Diolino J. Santos Filho</i> Simulation and Experiment on Electric Field Emissions Generated by Wireless Energy Transfer <i>E.N. BaikovaI, L. RombaI, R. Melicio, S. S. Valtchev</i> Simulation and Analysis of Surface Plasmon Resonance Based Sensor <i>Paulo Lourenço, Manuela Vieira, Alessandro Fantoni</i>
16:45– 17:00	Coffee Break
17:00–18:45 Pablo Neruda 2	<b>Panel session:</b> Young Researchers Views on Resilient Systems in a Digitized World <i>Collen Masilo, Kankam Okatakyie Adu, António Falcão, Miguel Teixeira, Cristiano De Faveri, Javaneh Ramezani. Ana Correia, Artem Nazarenko</i>
19:30 – 22:30	<b>Conference dinner</b>

## Friday, May 04, 2018

See also detailed program for **YEF-ECE 2018** in following sections.

	Session Title
9:30 – 11:00	<i>Chairs:</i> Bruno Mozzaquatro, Ricardo Madeira
Session E1: <b>Sensing Systems</b>	Fair Resource Assignment at Sensor Clouds Under the Sensing as a Service Paradigm <i>Joel Guerreiro, Luís Rodrigues and Noélia Correia</i>
Pablo Neruda 2	Elephant Herding Optimization Algorithm for Wireless Sensor Network Localization Problem <i>Ivana Strumberger, Marko Beko, Milan Tuba, Miroslav Minovic, and Nebojsa Bacanin</i>
	Hybrid RSS/AoA-based Target Localization and Tracking in Wireless Sensor Networks <i>Slavisa Tomic, Marko Beko, Rui Dinis</i>
11:00– 11:30	Coffee Break
11:30– 12:30	<b>Keynote 3</b> Enabling efficient management of distributed energy resources in the context of smart grids: A cognitive and Multi-Agent based approach <i>Zita Vale</i>
12:30– 13:45	Lunch
13:45 – 15:15	<b>Tutorial session 3:</b>
T3	<b>Petri Nets &amp; IOPT-tools</b> <i>Luis Gomes, Fernando Pereira, Filipe Moutinho</i>
Pablo Neruda 2	
13:45 – 15:15	<b>Tutorial session 4:</b>
T4	<b>Smart manufacturing and digitalization</b> <i>José Barata</i>
Pablo Neruda 1	
15:15 – 15:45	Coffee Break
15:45 – 17:30	<i>Chairs:</i> Fernando Monteiro, Andreia Artifice
Session F1: <b>Energy Distribution Systems</b>	Some Significant Problems of Lightning Protection in Flexible Energy Systems <i>Zoltán Tóth, István Kiss, Bálint Németh</i>
	Effect of Enhancing Distribution Grid Resilience on Low Voltage Cable Ageing <i>Gergely Márk Csányi, Zoltán Ádám Tamus, Péter Kordás</i>
Pablo Neruda 2	Suppression of Conducted Disturbances during the Partial Discharge Monitoring of Industrial Cable Systems <i>Richárd Cselkó, István Kiss</i>
17:30 – 18:15	<b>Closing and Awards</b>



# Horizontal Sessions

## **Horizontal Session 1:** *Marco Neves, NOVA FCSH*

**Title:** Strategies for visual scientific communication

**Abstract:** Visual communication elements as resource for effective transmission of scientific results.

Graphic design principles and their connection with main media used in academic research.

## **Horizontal Session 2:** *Guilherme Victorino, NOVA IMS*

**Title:** Design Thinking

**Abstract:** Design thinking is about believing we can make a difference, and having an intentional process in order to get to new, relevant solutions that create positive impact. Design Thinking gives you faith in your creative abilities and a process for transforming difficult challenges into opportunities for design.

## **Horizontal Session 3:** *Joana Marques, FPUL*

**Title:** Finishing My PhD: The Next 90 Days

**Abstract:** This session focuses on the development of skills to understand, redefine and/or change the path of a professional career using a stabilised framework of career planning and also to explore how to establish professional relationships potentially interesting.

## **Horizontal Session 4:** *Pedro Sousa, FCT NOVA*

**Title:** Leadership

**Abstract:** Doctors are used to work primarily as individuals, guarding their independence jealously. They value autonomy highly, but leadership is about working with others.

# Tutorial Sessions

## **Tutorial session 1:** *Fernando Lopes, Hugo Algarvio*

**Title:** Electricity markets and intelligent agents: The MATREM system and its application to the Iberian Daily Market

**Abstract:** The electric power industry has undergone a sweep restructuring resulting in the emergence of electricity markets (EMs) worldwide. The trend towards EMs has led to extensive efforts by the research community to develop optimization and equilibrium models adapted to the new competitive industry. The complexity of EMs calls, however, for richer and more flexible modelling techniques. The agent-based approach presents itself as a promising approach to accurately model and analyse in detail the behaviour of EMs over time. This session first gives an overview of intelligent agents and electricity markets, then presents an agent-based simulation tool for EMs, called MATREM (for Multi-Agent TRading in Electricity Markets), and finally describes specific cases of its application to the Iberian Daily Market.

## **Tutorial session 2:** *Luis Bernardo, Rodolfo Oliveira*

**Title:** Wireless Architectures for the Internet of Things

**Abstract:** The Internet of Things (IoT) is an emerging concept, where using sensors, the entire physical infrastructure is closely coupled with information and communication technologies. This encompasses intelligent monitoring and management, which can be achieved via the usage of networked embedded devices. The goal of this tutorial is to provide an overview on the existing wireless architectures for IoT, covering its major enablers, technologies, and several of its key applications. Different wireless standards and technologies capable of interconnecting the distributed wireless sensor networks will be overviewed. Additionally, we will browse their integration with the applications and the security mechanisms provided.

## **Tutorial session 3:** *Luis Gomes, Fernando Pereira, Filipe Moutinho*

**Title:** Petri Nets and IOPT-tools application – hands-on exercise

**Abstract:** This tutorial addresses usage of a model-based development approach using Petri nets as the underlying modeling formalism. The tutorial is divided into two parts, being the first one more on Petri nets fundamentals and presentation of the IOPT-Tools framework, while the second one emphasizes hands-on using IOPT-Tools for the development of controllers. s

The IOPT-Tools web-based framework provides support for the complete development flow for cyber-physical systems and embedded systems, offering tools for engineers as well as for academics, including editor, simulator, remote debugger, and property verification tools. Rapid-prototyping is fully supported, allowing automatic code generation ready to be directly deployed in different types of platforms, ranging from FPGAs (where VHDL code is produced) to popular low-cost boards, such as Arduino and Raspberry Pi (where C code is produced), and also including PLCs (through Instruction List generation).

Attendees are welcome to bring their own portable computers or smart phones to play with IOPT-Tools.

## **Tutorial session 4:** *José Barata*

**Title:** Smart manufacturing and digitalization

**Abstract:** Manufacturing systems are facing many challenges as a result of market and society needs. Personalised products, extended products, improved quality, rapid response, and other factors are forcing manufacturing companies to become smarter and more agile. The smart factory represents a leap forward from traditional automation to a fully connected and agile system. To achieve this goal we are assisting to a convergence of the digital and physical worlds, in which information technologies such as the Industrial Internet of the Things (IIOT), the Cyber Physical Systems (CPS), cloud computing, big data and data analytics, collaborative robotics, and 3D printing, are fundamental transforming factors. All these factors contribute to the current strong effort towards digitising industry, as represented by various national initiatives such as Industry 4.0 (DE), Made in China 2025 (CN), Smart Manufacturing (NL), etc.

This key note will briefly cover an historical perspective behind different manufacturing paradigms, presenting the most important challenges faced by current manufacturing systems, discussing the research that has been done the convergence between the digital and physical worlds, and finally pointing out some of the challenges that should drive future manufacturing systems research.



# Proceedings

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



## 2nd International Young Engineers Forum on Electrical and Computer Engineering (YEF-ECE 2018)

Innovation in Electrical and Computer Engineering Solutions

### Scope

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 computer 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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# Detailed Schedule YEF-ECE 2018

Friday, May 04, 2018

9:00 – 9:20 Opening Session: ROOM ???	YEF-ECE Opening Session	
9:20 – 11:00	<i>Chair: Tiago Cardoso</i>	
Session Y1: Process Systems	Cyber Security Challenges: An Efficient Intrusion Detection System Design <i>M. Firoz Kabir , Sven Hartmann</i>	
Pablo Neruda 3	Mixed reality application to support infrastructure maintenance <i>Hugo Silva, Ricardo Resende , Maurício Breternitz</i>	
	The Impact of Phase-noise on OFDM BER <i>Andreia Ribeiro, Luis Irio, Luis Oliveira , Rodolfo Oliveira</i>	
	Increasing Self-sufficiency of a Wastewater Treatment Plant with Integrated Implementation of Anaerobic Co-digestion and Photovoltaics <i>Pedro Duarte, João Pina , Elizabeth Duarte</i>	
9:20 – 11:00	<i>Chair: Anabela Gonçalves Pronto</i>	
Session Y2: Renewable Energies and Power Electronics	A better Integration of Wind Power Generation in Adrar Algerian Insulated Power System <i>Tarek Chihani, Saida Makhloufi, Abdelouahab Mekhaldi, Madjid Tegar , Arezki Kerkar</i>	
Pablo Neruda 1	PV panel for self-consumption in public buildings <i>Ana Catarina Monteiro, Cristina Camus , Eduardo Eusébio</i>	
	Modelling of a microgrid for high integration of renewable sources <i>Francisco J Gonzalez, Abraham Marquez , Jose I Leon</i>	
	Assessment of a Power Electronic Conversion System for a Self-Consumption PV Unit <i>Rodrigo M. M. Nunes , Sónia F. Pinto</i>	
	Multicell-type Charger for Supercapacitors with Power Factor Correction <i>Ievgen Verbytskyi, Oleksandr Bondarenko , Oleksandr Kaloshyn</i>	
11:00– 11:30	Coffee Break	
11:30– 12:30	<b>Keynote 3</b> Smart Grids <i>Zita Vale</i>	
Pablo Neruda 2		
12:30– 13:45	Lunch	
13:45– 15:15	<b>Tutorial 3</b> Petri Nets & IOPT-tools <i>Luis Gomes, Fernando Pereira, Filipe Moutinho</i>	<b>Tutorial 4</b> Smart manufacturing and digitalization <i>José Barata</i>
T3: Pablo Neruda 2 T4: Pablo Neruda 1		

15:15 – 15:45	Coffee Break
15:45 – 17:25	<i>Chair: Rui Neves da Silva</i>
Session Y3: Control Issues	Hybridized Moth Search Algorithm for Constrained Optimization Problems <i>Ivana Strumberger, Eva Tuba, Nebojsa Bacanin, Marko Beko , Milan Tuba</i>
Pablo Neruda 3	Trajectory Control Approaches for a Fault Tolerant Quadcopter <i>Alexandre Brito, Vasco Brito , Luis Brito Palma</i>
	Increasing the efficiency of NOC routing algorithms Based on Fault Tolerance measurement method <i>Mohammad Reza Hemmati, Mehdi Dolatshahi , Ahmad Mehrbod</i>
	Quality Control in Porcelain Industry based on Computer Vision Techniques <i>Daniela Onita, Nicolae Vartan, Manuella Kadar , Adriana Birlutiu</i>
	Impact of VCO Non-Linearities on VCO-based Sigma-Delta Modulator ADCs <i>Bruno Miguel Rosa Ferreira, Miguel Fernandes, Luís Oliveira , João Goes</i>
15:45 – 17:25	<i>Chair: Pedro Pereira</i>
Session Y4:	Power Quality Phenomena in Electrified Railways: Conventional and New Trends in Power Quality Improvement toward Public Power Systems <i>Mohamed Tanta, Vitor Monteiro , João Luiz Afonso</i>
Pablo Neruda 1	A Novel Two-Switch Three-Level Active Rectifier for Grid-Connected Electrical Appliances in Smart Grids <i>Vitor Monteiro, Tiago Sousa, Mohamed Tanta , João Afonso</i>
	LCL Filter Design for a Grid Connected Telecom Station AC-DC Converter using SiC Devices <i>Alexandre Bento, Ricardo Luís , Fernando Silva</i>
	Control strategies for low voltage DC residencial grids with constant power loads <i>Guilherme Paraíso, José Silva , Sónia Pinto</i>
	Cascade Multilevel STATCOM as a Solution to Improve the Voltage Profile of a Power Grid <i>Yasin Ahmad , Sonia Pinto</i>
17:30– 18:15	Closing and Awards

## Proceedings



Proceedings of YEF-ECE 2018, including the papers presented at the event, will be proposed to be published by IEEE and included in IEEE Xplore Digital Library.





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## DoCEIS 2018 & YEF-ECE 2018

### Wednesday 2 May 2018

08:00	Registration	
09:00	Opening session	
09:30	<b>Keynote 1</b> Blockchains <i>Laura Picci</i>	
10:30	Coffee break	
11:00	<b>A1</b> (3 papers)	<b>A2</b> (3 papers)
12:30	Lunch	
13:45	<b>H1</b> Strategies for visual scientific communication <i>Marco Neves</i>	
15:00	<b>B1</b> (3 papers)	<b>B2</b> (3 papers)
16:30	Coffee break	
17:00	<b>T1</b> Electricity markets & intelligent agents <i>Fernando Lopes, Hugo Algarvia</i>	<b>T2</b> Wireless Architectures for the IoT <i>Luís Bernarda, Rodolfo Oliveira</i>
18:30		
19:00	Welcome reception	

### Thursday 3 May 2018

09:00	<b>C1</b> (3 papers)	<b>C2</b> (3 papers)
10:30	Coffee break	
11:00	<b>Keynote 2</b> Dependable Internet of Things <i>Kay Römer</i>	
12:00	<b>H2</b> Design Thinking <i>Guthrie Victorino</i>	
13:00	Lunch	
14:15	<b>H3</b> Finishing my PhD <i>J. Marques</i>	<b>H4</b> Leadership <i>Pedro Sousa</i>
15:15	<b>D1</b> (3 papers)	<b>D2</b> (3 papers)
16:45	Coffee break	
17:00	Panel	
18:45		
19:30	Conference dinner	

### Friday 4 May 2018

09:00	Opening YEF-ECE			
	<b>E1</b> (3 papers)	<b>Y1</b> (5 papers)	<b>Y2</b> (5 papers)	
11:00	Coffee break			
11:30	<b>Keynote 3</b> <b>Smart grids</b> <i>Zita Vale</i>			
12:30	Lunch			
13:45	<b>T3</b> Petri Nets & IoT tools <i>Luís Gomes, Fernando Pereira, Filipe Moutinho</i>	<b>T4</b> Smart manufacturing and digitalisation <i>João Borralha</i>		
15:15	Coffee break			
15:45	<b>F1</b> (3 papers)	<b>Y3</b> (5 papers)	<b>Y4</b> (5 papers)	
17:30				
18:15	Closing and Awards			