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<b>Timetable A:</b> <b>SpliTech2023 Program</b>			
<b>June 20, 2023, IoT Day, University of Split, FESB, Virtual Access   TIME: 8:30 – 16:00</b>			
<b>June 21, 2023, Hotel Elaphusa, Bol (island of Brač), Virtual Access</b>			
TIME	BRAC 1	HVAR	KORCULA
08:00	REGISTRATION		
08:30-10:00	Invited: M. Santamouris BD1: Decarbonization strategies in buildings	IoT1: Session on IoT-aware Solutions and Research projects on One-Health and Safety ecosystems	RFID1: Special Session on RFID and IoT electronic and electromagnetic augmented devices and systems for sustainability, wellness, industry, and safety
10:00-10:30	Coffee Break		
10:30-11:00	Keynote: Ultan Mc Carthy, "The Electronic transformation of AgriFood Systems" (BRAC 1)		
11:00-12:30	Invited: T. Theodosiou BD2: Energy efficiency in buildings	IoT2: Special Session on Cybersecurity and IoT	RFID2: IEEE-CRFID Workshop on Flexible and Printable Technologies in Electronics and Electromagnetics (WFPE)
12:30-13:30	Lunch		
14:00-14:30	Keynote: Will Whittow, "3D printed antennas, metamaterials, and metasurfaces for microwave application" (BRAC 1)		
14:30-16:00	Meet the Editors	IoT3: Session on IoT technologies and use cases	RFID3: Wearable, conformal and flexible antennas for RFID/IoT
16:00-16:30	Coffee Break		
16:30-17:00	Keynote: Ivica Galic, "Defining the safety of pressure equipment in energy applications using XFEM" (BRAC 1)		
17:00-18:30	Invited: P. Fokaides BD3: Nzeb and high-performance buildings	IoT4: Session on BigData and Machine Learning Applications	RFID4: Future Trends of RFID Technology for Society and Industry Toward green IoT Devices
19:00-21:00	GUIDED TOUR		
<b>June 22, 2023, Hotel Elaphusa, Bol (island of Brač), Virtual Access</b>			
TIME	BRAC 1	HVAR	KORCULA
09:00-10:30	Invited: F. Ascione BD4: Energy and buildings	IoT5: Special Session on AI and Deep Learning applied to Smart environment	RFID5: Artificial intelligence (AI)-enhanced edge sensing and decision-making for electromagnetic devices
10:30-11:00	Keynote: Liming Luke Chen, "Hybrid Human Artificial Intelligence (HHA): Concept, Evolution and Application" (BRAC 1)		
11:00-11:30	Coffee Break		
11:30-13:30	<b>OPENING CEREMONY AND PLENARY TALKS (BRAC 1)</b> <i>HENRIK LUND "Resilient and Fully Decarbonized Smart Renewable Energy Systems.", ANDREA MASSA "Towards a Smart EM Environment (SEME) - Perspectives, Recipes, and Future Trends"</i>		
13:30-14:30	Lunch		
14:30-15:00	Keynote: Vladimir Blasko, "Practical Aspects and Trends in the Development and Design of Electrical Drives". (BRAC 1)		
15:00-15:30	Keynote: Thomas M. Jahns, "The Promising Future of Integrated Motor Drives in Tomorrow's E-Mobility Applications". (BRAC 1)		
15:30-17:00	BD5: Advanced energy systems and technologies in buildings		
21:00	CONFERENCE DINNER AND COCKTAILS		
<b>June 23, 2023, Hotel Elaphusa, Bol (island of Brač), Virtual Access</b>			
TIME	BRAC 1	HVAR	KORCULA
09:00-10:30	P1: Professional papers session I	H1: Health I	TPS IoT: Technical short papers IoT
10:30-11:00	Coffee Break		
11:00-12:30	P2: Professional papers session II	H2: Health II	TPS EM: Technical short papers engineering modelling
12:30-15:00	Lunch		

## Timetable B: SpliTech2023 Program

**June 20, 2023, IoT Day, University of Split, FESB, Virtual Access | TIME: 8:30 – 17:00**

**June 21, 2023, Hotel Elaphusa, Bol (island of Brač), Virtual Access**

TIME	VIS	SOLTA	BRAC 2
08:00	REGISTRATION		
08:30-10:00	EM1: Engineering modelling I	SC1: Smart City I	E1: Energy systems and processes I
10:00-10:30	Coffee Break		
10:30-11:00	Keynote: Ultan Mc Carthy, "The Electronic transformation of AgriFood Systems" (BRAC 1)		
11:00-12:30	EM2: Engineering modelling II	SC2: Smart City II	E2: Renewable energy systems and energy technologies
12:30-13:30	Lunch		
14:00-14:30	Keynote: Will Whittow, "3D printed antennas, metamaterials, and metasurfaces for microwave application" (BRAC 1)		
14:30-16:00	EM3: Engineering modelling in energy systems	SML1: Symposium Statistics and ML in Electronics I	E3: Energy efficiency and energy modelling
16:00-16:30	Coffee Break		
16:30-17:00	Keynote: Ivica Galic, "Defining the safety of pressure equipment in energy applications using XFEM" (BRAC 1)		
17:00-18:30	EM4: Engineering modelling III	SML2: Symposium Statistics and ML in Electronics II	E4: Energy systems and processes II
19:00-21:00	GUIDED TOUR		
<b>June 22, 2023, Hotel Elaphusa, Bol (island of Brač), Virtual Access</b>			
TIME	VIS	SOLTA	BRAC 2
09:00-10:30	CS1: Citizen Science session I	WF1: Wildfires Track I	WSP: RESHeat Workshop
10:30-11:00	Keynote: Liming Luke Chen, "Hybrid Human Artificial Intelligence (HHA): Concept, Evolution and Application" (BRAC 1)		
11:00-11:30	Coffee Break		
11:30-13:30	<b>OPENING CEREMONY AND PLENARY TALKS (BRAC 1)</b> <i>HENRIK LUND, "Resilient and Fully Decarbonized Smart Renewable Energy Systems",</i> <i>ANDREA MASSA "Towards a Smart EM Environment (SEME) - Perspectives, Recipes, and Future Trends"</i>		
13:30-14:30	Lunch		
14:30-15:00	Keynote: Vladimir Blasko, "Practical Aspects and Trends in the Development and Design of Electrical Drives". (BRAC 1)		
15:00-15:30	Keynote: Thomas M. Jahns, "The Promising Future of Integrated Motor Drives in Tomorrow's E-Mobility Applications". (BRAC 1)		
15:30-17:00	CS2: Citizen Science session II	WF2: Wildfires Track II	WSP: FSES: Flexible and smart energy systems to decarbonise buildings
21:00	CONFERENCE DINNER AND COCKTAILS		
<b>June 23, 2023, Hotel Elaphusa, Bol (island of Brač), Virtual Access</b>			
TIME	VIS	SOLTA	BRAC 2
09:00-10:30	TUTORIAL: Human Exposure to Electromagnetic Fields	PS: Professional short papers	
10:30-11:00	Coffee Break		
11:00-12:30	SDN: Smart Distributed Electrical Network	PV: Photovoltaics	
12:30-15:00	Lunch		

Symposium on IoT organizer: L. Patrono

Symposium on RFID & EM for IoT organizer: L. Catarinucci

Symposium on Statistics and Machine Learning in Electronics organizers: M. B. Marinov, S. Hensel, M. Ivanova

Symposium on Mitigation and Adaptation Strategies towards Decarbonization of Built Environment organizers: M. Santamouris

Symposium on Photovoltaics organizer: P. Manganiello, M. Muttillio

Special session: The Wildfires track organizers: Lj. Šerić, I. Gitas, M. Bugarić

Special session: Smart Distributed Electrical Network: Opportunities and Challenges for Integration of Renewable Energy Systems organizers: M. L. Kolhe, N. J. Johannesen

Special session: Enabling Citizen Science with emerging technologies to foster pro-environmental behaviour organizers: D. C. Mansilla, D. López de Ipiña

Special session: Wireless Power Transfer - Honour on the 80th anniversary of Nikola Tesla Death organizers: D. Poljak, Z. Blažević

Workshop: RESHeat organizer: P. Oclon

Workshop: Meet the editors Moderator: Sandro Nižetić Speakers: H. Lund, A. Papadopoulos, P. Oclon, M. Arici

Tutorials: Human Exposure to Electromagnetic Fields organizers: D. Poljak, M. Cvetković



**June 20, 2023 IoT Day, University of Split, FESB – ICT Županija, Virtual Access**

08:30	Registration
09:00-10:45	Career Speed Dating, IoT Workshop 1, IoT Workshop 2
10:45-11:00	Coffee Break
11:00-12:00	Company Presentations
12:00-12:30	Exhibition Sessions
12:30-13:00	Lunch
13:00-14:30	Career Speed Dating, IoT Workshop 3, IoT Workshop 4
14:30-14:45	Coffee Break

**June 21, 2023 Hotel Elaphusa, Bol (island of Brač), Virtual Access**

08:00	Registration
08:30-10:00	<b>Invited: M. Santamouris</b> , Technical Program: BD1, IoT1, RFID1, EM1, SC1, E1
10:00-10:30	Coffee Break
10:30-11:00	<b>Keynote speech Ultan Mc Carthy</b>
11:00-12:30	<b>Invited: T. Theodosiou</b> , Technical Program: BD2, IoT2, RFID2, EM2, SC2, E2
12:30-13:30	<b>Lunch</b>
14:00-14:30	<b>Keynote speech Will Whittow</b>
14:30-16:00	Meet the Editors, Technical Program: IoT3, RFID3 EM3, SML1, E3
16:00-16:30	Coffee Break
16:30-17:00	<b>Keynote speech Ivica Galić</b>
17:00-18:30	<b>Invited: P. Fokaides</b> , Technical Program: BD3, IoT4, RFID4, EM4, SML2, E4
19:00- 21:00	Guided Tour

**June 22, 2023 Hotel Elaphusa, Bol (island of Brač), Virtual Access**

09:00-10:30	<b>Invited: F. Ascione</b> , Technical Program: BD4, IoT5, RFID5, CS1, WF1, WSP
10:30-11:00	<b>Keynote speech Liming Luke Chen</b>
11:00-11:30	Coffee Break
11:30-13:30	<b>OPENING CEREMONY, Plenary talks: Henrik Lund, Andrea Massa</b>
13:30-14:30	<b>Lunch</b>
14:30-15:00	<b>Keynote speech Vladimir Blasko</b>
15:00-15:30	<b>Keynote speech Thomas M. Jahns</b>
15:30-17:00	Technical Program: BD5, CS2, WF2, WSP
21:00	<b>CONFERENCE DINNER AND COCKTAILS</b>

**June 23, 2023 Hotel Elaphusa, Bol (island of Brač), Virtual Access**

09:00-10:30	Technical Program: P1, H1, TPS IoT, PS, Tutorial
10:30-11:00	Coffee Break
11:00-12:30	Technical Program: P2, H2, TPS EM, SDN, PV
12:30-15:00	Lunch



# TECHNICAL PROGRAM CHAIR MESSAGE



**Joel J.P.C. Rodrigues**

Senac Faculty Ceará; KSU; UFPI;  
INATEL; IT - UBI.pt,  
Instituto de Telecomunicações



**Sandro Nižetić**

University of Split, Croatia

*Dear participants of the SpliTech2023 Conference*

*It is our pleasure to welcome you again to the new edition of SpliTech conference. Pandemic is behind us, and we are happy to experience normalization and to be able to organize SpliTech2023 as full-on site event. The main advantage and strength of SpliTech conference is unique approach for addressing of all major population problems and issues such as digitalization in all engineering professions, energy, energy efficiency, waste management and circular economy, renewable energy technologies, optimization and modelling of systems and processes in engineering and many others. All mentioned issues are key one to enable sustainable future that would be driven by smart use of information technologies. The new knowledge presented in a few days' high quality SpliTech2023 event will ensure information exchange between all important parties involved in society development by technological advancements such as academia members, professionals, industrial experts, etc. We are proud that we had the opportunity to take important role as TPC chairs and to ensure quality conference program with popular topics related to, Smart City/Environment, Energy and Engineering Modelling and eHealth. We have ensured quality and rich conference program in different events that will ensure fruitful discussions and new networking opportunities between all interested parties. Our main goal was to enable high quality event followed with address of all important topics for global population, i.e., to "Make life easier" as the main SpliTech conference slogan directs.*

*Special thanks go to our main conference Chairs prof. Dr. Henrik Lund and prof. Dr. Diego López-De-Ipiña González-De-Artaza, the plenary, keynote and invited speakers, technical program committee, session chairs, reviewers and finally authors. Also special thanks to our sponsors and their support to make this event on the high level. In the end, we would like to thank the entire organization team for their efforts and devoted time!*

*The 8th International Conference on Smart and Sustainable Technologies (SpliTech2023), co-sponsored by the IEEE Communications Society, will be held in Bol (Island of Brač) and in the beautiful historic city of Split. Therefore, we wish to welcome you to the SpliTech2023 and we are sure that you will enjoy your time during the conference!*

Joel J.P.C. Rodrigues and Sandro Nižetić  
SpliTech 2023 TPC Chairs

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# SPEAKERS



June 22, 11:30–13:30; Brač 1  
PLENARY SPEAKER



Henrik Lund  
Professor in Energy Planning at Aalborg University in Denmark

## Resilient and Fully Decarbonized Smart Renewable Energy Systems

This presentation focusses on how societies can design and achieve resilient and fully decarbonization energy systems based on renewable energy. The presentation addresses a set of methods and criteria to design Smart Energy Systems, while considering the context of 100% renewable energy on a national level. Countries should handle locally what concerns local demands, and at the same time acknowledge the international context when discussing resources and industrial and transport demands. Following such approach will also lead to a resilient energy solution. To illustrate the method, it is applied to the cases of Denmark and European within the context of a global fully decarbonized energy system.

The goals of the Danish Government supported by the Danish Parliament is to reduce Greenhouse gas emissions by 70% in 2030 and to achieve a net zero emission society by 2050. Moreover, due to the war in Ukraine, there is also a strong wish for a resilient energy supply. This presentation includes a list of theoretical and methodological considerations as well as a concrete proposal on how such targets can be implemented. It is highlighted that already now one must think beyond 2030 to prepare for the next step to achieve a full decarbonization by 2040 or 2050. It is also highlighted that a country such as Denmark must consider how to include its share of international shipping and aviation as well as how to design a solution with Denmark's share of sustainable biomass resources.

Moreover, the presentation includes the results of detailed hourly modeling of the EU "A Clean Planet" scenarios for a fully decarbonized Europe in 2050 and compare it to a "smart energy systems" alternative. The case illustrates how the focus on a fully sector-coupling as expressed in a smart energy systems approach will lead to higher energy efficiency and the identification of a more affordable green transition in Europe.

## **Biography**

Henrik Lund (born 2 July 1960) is a Danish engineer (M.Sc.Eng.1985) and Professor in Energy Planning at Aalborg University in Denmark. He holds a Ph.D. in Implementation of Sustainable Energy Systems (1990), and a Dr. Techn. in Choice Awareness and Renewable Energy Systems (2009).

Henrik Lund is a highly ranked world-leading researcher. He is listed among ISI Highly Cited researchers ranking him among the top 1% researchers in the world within engineering and on the Stanford list of top 2% scientists.

Henrik Lund has many years of management experience as head of department for approx. 200 staff persons (1996-2002), head of section for approx. 50 persons (2014 – 2016) and head of research group of 20-30 persons (2002 – present). During his time the Sustainable Energy Planning research group at Aalborg University has now grown to approx. 30 staff members including 4 professors.

Henrik Lund is Editor-in-Chief of Elsevier's high-impact journal Energy with annual 10000+ submissions.

Henrik Lund is the author of more than 400 books and articles including the book "Renewable Energy Systems". He is the architect behind the advanced energy system analysis software EnergyPLAN, which is a freeware used worldwide that have form the basis of more than 200 peer reviewed journal papers around the world.

PLENARY SPEAKER  
June 22, 11:30–13:30; Brač 1



ANDREA MASSA  
Full Professor of Electromagnetic Fields at  
University of Trento since 2005.,  
"ELEDIA Research Centre"

## Towards a Smart EM Environment (SEME) - Perspectives, Recipes, and Future Trends

Future standards beyond the fifth-generation (5G) will substantially change the way a communication system is nowadays conceived and deployed. The progressive shift to millimeter-waves and the need for massive access and ubiquitous wireless coverage with extreme data throughput will pose unprecedented challenges in the design of next generation systems. Higher capacity and link reliability, lower latency and power consumption as well as reduced costs and complexity are just few representative examples of several goals to be addressed in the forthcoming years by academic and industry researchers with unconventional solutions. Clearly, the era of designing communication systems in ideal propagation conditions and without obstacles in the propagation channel is destined to end soon. Indeed, the complex scattering environment where the communication architecture is deployed cannot be no more regarded as an uncontrollable impairment to the overall quality of service (QoS). Accordingly, standard line-of-sight (LOS) key performance indicators (KPIs) such as gain, half-power beam-width, and side-lobe level should be discarded in favour of QoS system-level KPIs. Moreover, the environment has to be reinterpreted as an enabling factor towards a smart electromagnetic environment (SEE) for the radio communications. According to such a vision, the propagation channel is not only involved in the design process, but it also assumes a positive role in fulfilling demanding system-level performance requirements. This talk will discuss on the perspectives of the SEME vision dealing with current trends and advances towards its implementation and full-deployment.



## Biography

Andrea Massa (IEEE Fellow, IET Fellow, Electromagnetic Academy Fellow) he has been a Full Professor of Electromagnetic Fields at University of Trento since 2005.

At present, Prof. Massa is the director of the network of federated laboratories “ELEDIA Research Center” located in Brunei, China, Czech, France, Greece, Italy, Japan, Peru, Tunisia with more than 150 researchers. Moreover, he is holder of a Chang-Jiang Chair Professorship at UESTC (Chengdu ñ China), Visiting Research Professor at University of Illinois at Chicago (Chicago ñ USA), Visiting Professor at Tsinghua (Beijing - China), Visiting Professor at Tel Aviv University (Tel Aviv ñ Israel), and Professor at CentraleSupÉlec (Paris - France). He has been holder of a Senior DIGITEO Chair at L2S-CentraleSupÉlec and CEA LIST in Saclay (France), UC3M-Santander Chair of Excellence at Universidad Carlos III de Madrid (Spain), Adjunct Professor at Penn State University (USA), Guest Professor at UESTC (China), and Visiting Professor at the Missouri University of Science and Technology (USA), the Nagasaki University (Japan), the University of Paris Sud (France), the Kumamoto University (Japan), and the National University of Singapore (Singapore). He has been appointed IEEE AP-S Distinguished Lecturer (2016-2018) and served as Associate Editor of the “IEEE Transaction on Antennas and Propagation” (2011-2014).

His research activities are mainly concerned with inverse problems, antenna analysis/synthesis, radar systems and signal processing, cross-layer optimization and planning of wireless/RF systems, system-by-design and material-by-design (metamaterials and reconfigurable-materials), and theory/applications of optimization techniques to engineering problems (coms, medicine, and biology).

Prof. Massa published more than 900 scientific publications among which more than 350 on international journals (> 14.700 citations ñ h-index = 63 [Scopus]; > 12.000 citations ñ h-index = 58 [ISI-WoS]; > 23.900 citations ñ h-index = 88 [Google Scholar]) and more than 570 in international conferences where he presented more than 210 invited contributions (> 50 invited keynote speaker) ([www.eledia.org/publications](http://www.eledia.org/publications)). He has organized more than 100 scientific sessions in international conferences and has participated to several technological projects in the national and international framework with both national agencies and companies (18 international prj, > 5 MÄ; 8 national prj, > 5 MÄ; 10 local prj, > 2 MÄ; 63 industrial prj, > 10 MÄ; 6 university prj, > 300 KÄ).

KEYNOTE SPEAKER



Ultan Mc Carthy  
South East Technological University (SETU)  
Ireland

## The Electronic transformation of AgriFood Systems

The lecture will adopt both a technical and application based focus on the Electronic transformation of our global AgriFood Systems. It will encompass a variety of approaches towards using a vast array of electronic technologies being adopted globally to add value and beneficially transform many areas of our global AgriFood sector. It will aim to answer questions including but not limited to (1) how and where are electronics currently being deployed into the global AgriFood sector and (2) where is the value add being realised within each sector and (3) Discuss the suitability of the technology and also present (where possible) many of the deployment challenges. Finally it will where possible identify some key areas worthy of further exploration into the future to fully leverage the potential of the technology.

This session will provide the audience with a wide perspective of the current and future needs of the existing and future value-adding potential of the Electronic transformation of our global AgriFood Systems.

June 21, 10:30–11:00, Brač 1

## **Biography**

Ultan Mc Carthy PhD MBA, is currently an academic based at the South East Technological University (SETU) Ireland. He has many years experience in experience across Europe ad the USA in the deployment of a variety of Auto ID and sensing technologies across multiple sectors including pharmaceutical, food, automotive, aviation and defense. He has also explored the impact of the potential of these technologies to add value to these process through the provision on data being made available across the value chains with which to improve decision making, transparency and overall system responsiveness.



William G. Whittow  
Wolfson School of Mechanical, Electrical  
and Manufacturing Engineering (WSMEME)  
at Loughborough University

## 3D printed antennas, metamaterials, and metasurfaces for microwave application

My research relates to radiofrequency materials which encapsulates altering the dielectric properties and internal / external shape to design novel antennas, filters, and metamaterials. I have been working in this area for more than a decade and recently led a large multi-institution project on this topic. 3D printing not only allows control of the external shape, the local relative permittivity can be tailored to precise specifications by controlling the internal geometry and hence varying the ratio of air and filament. The local relative permittivity can then be graded in all three axes for extra degrees of freedom. This can be exploited to create flat grade index lenses as well as hybrid lenses. By using specialist printers and careful control of the settings, filaments with relative permittivities up to 15 can be printed. Ceramics can be used for ultra-low loss materials. The talk will demonstrate how these RF materials can be used to create artificial dielectrics, filters, metamaterials, and bespoke antennas. The talk will also cover the challenges of measuring dielectric properties. We have recently developed a bespoke system to measure the properties of anisotropic and (dia)magnetic materials. In addition, we will discuss inkjet printing including on curved surfaces; RFID tags; metasurfaces, intelligent reconfigurable surfaces; and sensing for Bioelectromagnetics in Healthcare.

## Biography

Prof. William G. Whittow AFWES SFHEA SMIEEE received the B.Sc. degree in Physics and the Ph.D. degree in Computational Electromagnetics from the University of Sheffield, Sheffield, U.K., in 2000 and 2004, respectively. From 2004 to 2012, he was a Research Associate at Loughborough University, Loughborough, U.K. In 2012, he became a Lecturer in the Wolfson School of Mechanical, Electrical and Manufacturing Engineering (WS-MEME) at Loughborough University. He became a Senior Lecturer in 2014, a Reader (Associate Professor) in 2018, and a Professor of Radiofrequency Materials in 2020. He leads the Wireless Communications Research Group (WiCR) and is the Director the Connected Infrastructure Research Hub. He is a named Investigator on research grants totalling in excess of £12m. He has authored more than 250 peer-reviewed journal and conference papers in topics related to metamaterials, metasurfaces, synthetic and heterogeneous dielectrics, dielectric measurements, 3D-printing, wearable antennas and phantoms, specific absorption rate, embroidered antennas, inkjet printing, and RFID tags. From 2007-2011, he was the Coordinating Chair of the Loughborough Antennas and Propagation Conference (LAPC). He has served as an Associate Editor of IET's Electronics Letters and also Microwaves, Antennas and Propagation. He serves on the technical programme committees of several IEEE international conferences. He has been asked to give more than 25 invited conference presentations; a 4-day invited workshop on bioelectromagnetics and teaches about dielectric measurements at the European School of Antennas. In 2017, he won the Women in Engineering Society (WES) Men As Allies Award and he is the inaugural male Associate Fellow of WES. He is a Senior Fellow of the Higher Education Academy.



Ivica Galić  
Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia

## Defining the safety of pressure equipment in energy applications using XFEM

Valves are the primary elements used to control the flow of media in power plants. Therefore, they greatly affect the very reliability of the operation of such plants. They are often loaded by high internal pressure and high temperature of the medium flowing through them. To define are the valves safe for people in their environment, they fall under strict pressure equipment directives 2014/68/EU. According to those directives it is necessary to defining a category in which is considered valve. Defining the category an engineer can determine the scope of the technical calculations and the necessary certificates that need to be obtained before putting the valve into operation. Here lies one big problem because directives support only vessels and pipes. Therefore, this paper describes in detail the categorization of valve with respect to those directives and procedure of valve body wall thickness calculation during the design phase.

As mentioned, the reliability of power plants is largely related to the reliability of valve operation, and therefore it is necessary to define their maintenance interval. In order to obtain this interval, it is necessary to determine the maximum failure that the valve body can contain and still safely operate until the next maintenance. Common method is defining number of cycles necessary for the crack reaching its critical dimension. One way to accomplish this is using the Finite Element Method (FEM) and the classical singular element formulation to determine the fracture mechanics parameters and then with help of Paris law to define the crack growth. Knowing this rate, it is possible to define the service interval. This method is very time-consuming, so this article describes in detail the relatively new eXtended Finite Element Method (XFEM), its application, as well as the possible dangers of using XFEM. At the end of article, it is shown an example of defining crack growth in the wall of the valve body.

## Biography

Ivica Galić was born on 26th November 1975. in Široki Brijeg, BiH. He graduated from primary school in Mostar and finished high school in Široki Brijeg. He started to study mechanical engineering at the Faculty of Mechanical Engineering and Naval Architecture of the University of Zagreb in the academic year 1994/95. He graduated in 2001, majoring in Mechanical Engineering.

He was employed in 2002 in the company ATM Ltd. as a constructor. In the academic year 2003/2004. he enrolled in postgraduate studies at the Faculty of Mechanical Engineering and Naval Architecture, majoring in Structural Theory. Since 2009, he has been working as an assistant at the Chair of Machine Elements at the Department of Design of the Faculty of Mechanical Engineering and Naval Architecture in Zagreb. From the first of November 2010. to the tenth of July 2017., he was the head of the Laboratory for Machine Assemblies at the Department of Design. He defended his doctoral thesis entitled "Estimation of the service life of the valve housing" on the twenty-eighth of June 2012. He was awarded the associate title of senior assistant on the seventeenth of October 2012. He was elected to the scientific title of Assistant research scientist on the eighth of May 2013., while he was elected to the scientific-teaching title of assistant professor on second of November 2015. He was elected to the scientific title of Associate research scientist on the eighth of December 2021. From the second of November 2022. he was Associate professor.

During his previous work at the faculty, he gave lectures from the courses Elements of Construction, Lightweight constructions, Mechanical Constructions and participated in exercises from the courses Elements of Constructions, Construction Elements of Robots, Lightweight constructions and Mechanical constructions.

In the period from the first of June 2018. to the first of June 2019. he spent time in Vienna at the AtomInstitute at the Technical University as part of professional training.

As an author or co-author, he published 17 scientific papers. He participated in 5 international and 3 domestic scientific conferences. He reviewed a book for the needs of the Technical Polytechnic in Zagreb, entitled "Technical documentation of drawings - documentation".

He is a member of the technical committee TO 544, Machine components at the Croatian Standards Institute, and since December 2019 he is also a member of the editorial board of the journal Transactions of FAMENA. He is married and has three children. He speaks and writes in English and uses German passively.



Liming Luke Chen  
Research Director School of Computing Uni-  
versity of Ulster, United Kingdom

## Hybrid Human Artificial Intelligence (HHAI): Concept, Evolution and Application

The growing computation power enabled by cloud computing, coupled with the ever-increasing machine learning and statistical methods, in addition to the availability of big data generated by the Internet of Things (IoT), mobile devices and social networks, have led to a great leap in the need and progress of Artificial Intelligence (AI) technologies and applications. Nevertheless, there are deeply-rooted concerns from a technical and ethical perspective with the foreseen AI-enabled industrial innovation and intelligent world.

June 22, 10:30–11:00, Brač 1

Humans want machines to be intelligent, thus serving them, as much as possible, and yet they concern that these machines with full autonomy may one day outperform them to become too powerful to be controlled. The blend of desire and fear has led to this emerging futuristic research area - hybrid human-artificial intelligence.

— from the Editorial of Special Issue on Hybrid Human Artificial Intelligence, *IEEE Computer*, July 2020

In this talk the speaker will elaborate the concept of hybrid human artificial intelligence and its evolution and examine closely the research issues and approaches. Following this he will present two exemplar HHAi research in the context of digital healthcare and IoT cyber security. He will then discuss research challenges and future directions to stimulate new ideas and approaches in this promising research area.



## **Biography**

Dr Liming (Luke) Chen is Professor of Data Analytics, Research Director for the School of Computing at Ulster University, UK. His current research interests include data analytics, artificial intelligence, pervasive computing, user-centred smart cyber-physical systems and their applications in smart healthcare and IoT cybersecurity. Dr Chen has over 280 publications in internationally recognised journals, book series and conferences. He was the General Chair for IEEE Digital Twin 2023, IEEE WoWMoM2022, IEEE Smart World Congress 2019, IEEE UIC2017, IEEE HealthCom2017, and an associate or guest editor for IEEE THMS and Computer, Elsevier PMC and IJDSN and Springer PUC and AIHC. His research has been funded by external grants from the UK research councils, European Research Programmes such as FP7, AAL and Horizon 2020, and industrial collaborators like SAP, British Telecommunication and PwC. Dr Chen has delivered over 40 keynotes, invited talks and seminars in various forums, conferences, industry and academic events. He has served as an expert for research funding assessment for UKRI, EU Horizon2020, Canada, Chile, Netherlands and Denmark.

KEYNOTE SPEAKER

June 22, 14:30–15:00, Brač 1



Vladimir Blasko  
Sikorsky Aircraft Corp, University of Wisconsin – Madison, USA

## Practical Aspects and Trends in the Development and Design of Electrical Drives

Over last 50 years industrial drives have been subject to significant improvements. The development was driven primarily by the advances of power electronics devices transitioning from thyristors with soft switching commutation over silicon-based junction device (slow BJT and faster IGBTs), towards modern nowadays drives with SiC and GaN (very fast switching) channel devices. Power devices have been driving size, efficiency, and the development of power converter topologies. Operation and performances were further significantly influenced by advancements in control hardware (combinations of microprocessors and FPGAs) and control algorithms with model-based design, reaching nowadays amazing flexibility and creativity in implementation.

The talk will start with historic overview of power converters driven by technology advancements in power devices, control hardware and software/algorithms. The starting point will be availability of hard switching bipolar transistors (BJT) in the middle of 1970-ties replacing thyristors in line or load commutated soft - switching converters. The introduction of hard switching device resulted with explosion in the development of new power converter topologies. Some of the most popular in industry: nonregenerative 2 level, 3 level DC/AC, 3 phase regenerative back-to-back AC/DC/AC converters, regenerative direct frequency changes – Matrix Converters, current source, Z DC link, Vienna and resonant converters will be compared. Practical implementation, EMI, thermal management, and reliability issues as major part of the design of industrial drives will be presented. The talk will be concluded with future challenges, trends and opportunities arriving from new SiC and GaN device in drive designs.

## **Biography**

Dr. Vladimir Blasko received PhD, MSc and BSc, from the University of Zagreb, Croatia all in Electrical Engineering. He holds the position of LM Fellow at Sikorsky Aircraft Corp. Previously he was a Senior Fellow, Fellow and Power Electronics group leader at United Technologies Research Center, Fellow and Principal Engineer at Otis Elevator Company, Principal Engineer at Rockwell Automation - Allen Bradley Co all in USA, and Research Engineer at Koncar Co, Zagreb, Croatia. He is IEEE Life Fellow and a member of National Academy of Engineering (NAE) USA and a member of Connecticut Academy of Science and Engineering (CASE). He holds the position of Adjunct Professor at the University of Wisconsin - Madison. He was a recipient of IEEE - 2020 Gerald Kliman Innovation Award "For the contributions to the theoretical and practical advancements of regenerative converters and electrical drives". Dr. Blasko has published more than 50 papers and holds more than 30 patents. His areas of research interest are electrical aircraft power propulsion systems, power electronics, modern AC drives, distributed energy systems, and applied modern control theory and technology.

June 22, 15:00–15:30, Brač 1  
KEYNOTE SPEAKER



Thomas M. Jahns  
Grainger Emeritus Professor of Power Electronics and Electrical Machines WEMPEC /  
University of Wisconsin – Madison USA

## The Promising Future of Integrated Motor Drives in Tomorrow's E-Mobility Applications

The electrification of all modes of transportation holds great potential for significantly reducing global fossil fuel consumption and greenhouse gas emissions. A promising strategy for spurring much broader adoption of adjustable-speed motor drives is to physically integrate the power electronics inside electric machines, achieving major mass, volume, and cost reductions by eliminating separate enclosures and connecting cables. This tutorial explores the past, present, and future of integrated motor drives (IMDs) by first reviewing past and recent milestones in IMD developments including the underlying technologies that have both enabled and constrained them. Attention is next turned to transformative advances in wide-bandgap (WBG) power semiconductor technology (SiC and GaN) that offer exciting opportunities for shrinking the size of power converters by significantly raising their operating frequencies. Looking ahead, the case will be made for using WBG switches to spark a revival of current-source inverters (CSIs) for future machine drives. Recent IMD research projects at UW-Madison covering a wide range of power ratings from 3 kW to 1 MW will be briefly reviewed. These projects will be used to highlight the impressive progress that is being made worldwide to extend the boundaries of IMD technology in demanding high-performance applications ranging from electric vehicle traction drives to electrified aircraft propulsion drives. The presentation will conclude with a review of both the opportunities and challenges presented by WBG switches for realizing the full potential of integrated motor drives during coming years.

## **Biography**

Thomas M. Jahns received his PhD and combined MS/BS degrees in electrical engineering from the Massachusetts Institute of Technology in 1978 and 1974, respectively.

In 1998, Dr. Jahns joined the Department of Electrical and Computer Engineering at the University of Wisconsin-Madison as a Grainger Professor of Power Electronics and Electric Machines, where he served as Co-Director/Director of the Wisconsin Electric Machines and Power Electronics Consortium (WEMPEC) for 14 years from 2007 to 2021. Prior to joining UW, he worked at GE Corporate Research and Development (now GE Global Research Center), in Niskayuna, NY, for 15 years. Since his retirement from the active faculty in 2021, Dr. Jahns is continuing to pursue research as a Grainger Emeritus Professor in the areas of high-performance permanent magnet machines, and integrated motor drives using wide-bandgap switches.

Dr. Jahns received the 2005 IEEE Nikola Tesla Technical Field Award and the IAS Outstanding Achievement Award in 2011. He has served both the IEEE Industry Applications Society and Power Electronics Society (PELS) as a Distinguished Lecturer. Dr. Jahns is a Past President of PELS and served two years as Division II Director on the IEEE Board of Directors (2001-2002). He was elected as a member of the US National Academy of Engineering in 2015 and received the IEEE Medal in Power Engineering in 2022.

June 21, 08:30–10:00, Brač 1 INVITED SPEAKER



MATTHEOS SANTAMOURIS

Anita Lawrence Chair on High Performance Architecture; Faculty of Built Environment; University of New South Wales, Sydney, Australia

## Recent developments and proposal to overcome extreme overheating in cities

Overheating of the Built Environment is the most documented phenomenon of climate change impacting the human life in many ways. This lecture will present the most recent developments on the magnitude and the characteristics of the urban overheating and the potential synergies with the global climatic change. It will analyse the latest qualitative and quantitative data on the impact of higher urban temperatures on the building's energy supply and demand, heat related mortality, morbidity and wellbeing, human productivity, survivability of low-income population and environmental quality of cities. It will present and describe the state of the art on the development of innovative mitigation materials, advanced urban greenery, heat dissipation and evaporative techniques, as the main mitigation and adaptation technologies to offset the impact of urban overheating. It will analyse and present the current knowledge on the impact of each mitigation technology on energy, health, environmental quality, urban economy and survivability. Finally, it will present the main future challenges related to urban overheating and proposes a specific research agenda to alleviate and counterbalance its impact on human life.

## **Biography**

Mat Santamouris is the Anita Lawrence Professor of High Performance Architecture in the University of New South Wales in Australia. He is a past professor at the University of Athens, Greece and visiting Professor at the Cyprus Institute, Metropolitan University of London, Tokyo Polytechnic University, Bolzano University, Brunel University and National University of Singapore. Past President of the National Center of Renewable and Energy Savings of Greece. Editor in Chief of the Energy and Buildings, Past Editor in Chief of the Journal of Advances Building Energy Research, Associate Editor of the Solar Energy Journal and actual or past Member of the Editorial Board of the International Journal of Solar Energy, Journal of Buildings and Environment, Journal of Sustainable Energy, Journal of Low Carbon Technologies, Journal of Open Construction and Building Technology, Sustainable Cities and Society and of the Journal of Ventilation. Editor of the Series of Book on Buildings, Energy and Solar Technologies published by Earthscan Science Publishers in London. Editor and author of 15 international books on topics related to heat island, solar energy and energy conservation in buildings published by Earthscan, Springer, etc. Guest editor of twelve special issues of various scientific journals. Scientific coordinator of many international research programs and author of almost 290 scientific papers published in peer reviewed international scientific journals. Reviewer of research projects in 15 countries including USA, UK, France, Germany, Canada, Sweden, etc. Expert in various International Research Institutions. Highly Cited researcher according to Clarivate in 2017 and 2018.

June 21, 11:00–12:30, Brač 1  
INVITED SPEAKER



Theodoros Theodosiou  
Civil Engineering Department of the Aristotle University of Thessaloniki, Greece

## Supporting decarbonization in the built environment through effective construction & demolition waste management

The relevance of the embodied energy of new structures has grown as a result of the systematic adoption of effective policies, technologies, and “know-how” that allowed for the achievement of the “near zero energy building” aim in new structures. Establishing long-term, challenging goals like those for the year 2050 forces the life-cycle approach to be used in all decarbonization efforts. The need to improve the environmental performance of the urban environment has grown as a result of the predicted accelerated urbanization and the steadily rising demand for high-quality materials for building construction or renovation. Ideally, this should be done by converting the urban environment from a material consumer to a source of materials for its efficiency improvement. To limit the CO<sub>2</sub> emissions from the entire construction chain, this transition necessitates the development of new techniques and technologies throughout the entire chain. The presentation tries to provide insight into the problem and the first actions to improve this part of our effort for decarbonization.

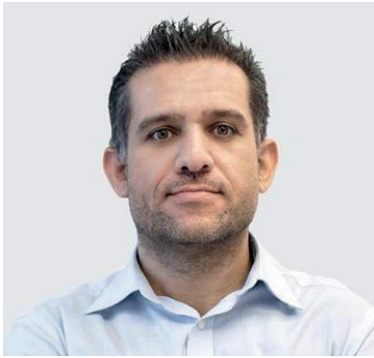


## **Biography**

Dr. Theodoros Theodosiou is a Civil Engineer, Professor at the Civil Engineering Department of the Aristotle University of Thessaloniki, Greece, teaching courses relevant to the environmental and energy performance of buildings.

His research interests are mainly focused on building energy efficiency, building physics, advanced building envelopes, Low and Near Zero Energy Buildings, and sustainability of buildings and circularity in the built environment. He has participated in many European and National research programs and has more than 100 publications in international journals and conference proceedings. He has been ranked among the top 2% of researchers in his scientific field based on his published record for the years 2019, 2020, 2021 and in the top 2% in his scientific field based on his entire career publications, according to Elsevier & Stanford University's ranking.

June 21, 17:00 – 18:30, Brač 1 INVITED SPEAKER



Paris Fokaides  
School of Engineering, Frederick University,  
Cyprus

## Tools for Digitizing Buildings Energy Audits: Case Studies and First Evidences

The current methods of conducting energy audits in buildings are time-consuming and resource-intensive. New approaches to energy audits that integrate digital twin practices with building measurement technologies, creating a complete digital representation of the building for online energy audits are required. Digitizing energy audits give the potential to revolutionize the field of energy auditing, providing more accurate recommendations for improvement while saving time and resources.

This study presents a new approach to conducting energy audits in buildings. The study focuses on the integration of measurements taken in buildings with digital twin practices to create an online energy audit. The purpose of this study is to present the architecture of the tool used for this purpose as well as the first results of the integration of these practices. The tool used in this study is a combination of digital twin practices and building measurement technologies. The digital twin allows for the creation of a virtual model of the building, while the measurement technologies provide the necessary data to populate the virtual model. The result is a complete digital representation of the building that can be used for online energy audits.

The study presents the architecture of the tool used in this process, which includes the use of sensors to collect data on energy consumption, the creation of a digital twin of the building, and the integration of the two to create an online energy audit. The study also presents the first results of this approach, which indicate that this method is effective in identifying energy inefficiencies and providing recommendations for improvement. The study is expected to be a breakthrough in the way energy audits are conducted. By digitizing the process, the energy audit can be conducted online, saving time and resources. The integration of digital twin practices with building measurement technologies provides a more comprehensive understanding of the building's energy consumption, leading to more accurate recommendations for improvement.

## Biography

Dr.-Ing. Paris A. Fokaides is an Associate Professor at the School of Engineering of Frederick University, Cyprus, and a research mentor at Kaunas University of Technology, Lithuania. In Frederick University, Paris is lecturing the courses of Fluid Mechanics and Heat Transfer at the Department of Mechanical Engineering, as well as the courses of Sustainable Energy Resources, and Energy Design of Buildings in the Masters Programme of Energy Engineering, which he also coordinates. He is also the supervisor of 5 PhD students and 3 PhD graduates. Paris holds a PhD from the University of Karlsruhe, in Germany in the field of Process Engineering and a Diploma in Mechanical Engineering of Aristotle University in Thessaloniki, Greece. Paris research is mainly related to sustainable energy technologies for the built environment, as well as novel energy related applications in constructions. Paris is involved in research, having actively participated in over 25 research projects related to the field of sustainable built environment over the past 10 years. His research projects are related to the promotion of Industry 4.0 practices for the assessment of the energy performance of the built environment, smart buildings, as well as the field of digitization and analysis of energy related processes. Paris has also served as consultant of the Republic of Cyprus in numerous projects related to the transposition of the European Acquis into the national legislation, in the policy fields of energy, environment and transportation. Paris leads the Sustainable Energy Research Group at Frederick University, an ISO 9000 certified self-funded research team consisting of 10 FTE researchers, involved in European and national funded R&I activities. He is also actively involved in the publications section, being Editor in Chief of the International Journal of Sustainable Energy (Taylor and Francis) and editorial board member in other Q2 and Q3 Springer, Taylor and Francis and MDPI journals in the field of sustainable energy. As of mid 23, Paris has authored and co-authored over 150 Scopus indexed studies, and has an h-index of 32.

June 22, 09:00–10:30, Brač 1 INVITED SPEAKER



Fabrizio Ascione  
Assistant Professor at Fisica Tecnica Ambientale, Università degli Studi di Napoli, Italy

## Decarbonization of the EU Cities: methodological approach and technological challenges, from single building to the building stock

The last Energy Performance of Building Directive has been just approved in the winter/spring 2023, by EU Institution. This novel version of EPBD strongly will orient building activity and the construction sector in the next future, establishing new targets, strong and that cannot be postponed, to improve the thermal and energy performance of our cities, and finally achieve a zero-emission built environment, within 2050. Still today, building demands a too-high share of energy, being responsible for more than 35% of greenhouse-gas emissions. The high energy intensity, besides pollution and global and local warming, has concerns related to the poor availability of energy and sources for a significant share of the EU population, being thus necessary to consider the dramatic phenomena of energy poverty, which risks being more intense with the increase of climate change and rising of building cooling needs. This lecture, even if with brief spots, concerns some of such topics, and thus open-issues and novel opportunities, particularly with reference to new challenges for next years, to mitigate energy demands in existing buildings, moving toward the zero-emission targets for new buildings, contrasting indoor overheating, measures to face vulnerability for low-income households, even with a view from a single building to a stock-perspective.

## Biography

Fabrizio Ascione is an Associate Professor of Applied Thermodynamics and Heat Transfer in Buildings, at the University of Napoli Federico II, Department of Industrial Engineering. After the Ph.D. in Engineering of Mechanical Systems (2009), he was research fellow at the University of Sannio (2010-2012), then a researcher, and after a professor at University Federico II. Ascione teaches Applied Thermodynamics and Heat Transfer in Buildings, Technological Systems, Air-conditioning, and Building Bioclimatic Envelope, being the Tutor of many Thesis dissertations (Energy Engineering, Civil Engineering, Mechanical Engineering, Architecture, Bachelor and Master of Science). He is member of the teaching body of the Ph.D. program TIM - Technology, Innovation and Management - provided jointly by the University of Bergamo and the University of Naples Federico II. The research is carried out through analytic, numerical, and experimental approaches, together with the consolidated research partners at the University of Molise and the University of Sannio. The scientific work focuses on the evaluation of energy performances of buildings and HVAC systems, the energy-saving potential of historical buildings and centers, hospitals, schools, and museums, innovative components for the building envelope, and numerical methods for studying the effect of thermal bridges under transient conditions, low-energy heating and cooling systems, ground cooling, energy optimizations of buildings and districts, renewable energy sources at the building scale, all investigated also by means of model predictive control. He is the author of more than 140 scientific articles, a reviewer for about 30 international journals. In June 2022, F. Ascione is Associate Editor of Energy Reports (Elsevier) and Editorial Board Member of Energy and Buildings (Elsevier), Energy Sources Part A: Recovery, Utilization and Environmental Effects (Taylor & Francis), Sustainability Analytics and Modeling (Elsevier), Energies (MDPI), Buildings (MDPI), Geosciences (MDPI). Ascione received international awards as the author (Best Paper 2016/2017 for Solar Energy Journal, topic Solar Thermal / Heating / Cooling) and reviewer (among the Best Reviewers of Applied Energy Journal 2013, recognized top reviewer for several international journals) and ranked among the top 100'000 world scientists for specific years. He served as an international reviewer or referee and auditor for several projects and proposals, for projects of the EU Commission, national and international competitions, in several countries, and for public Institutions and Universities. Starting from 2015, at the University of Napoli Federico II, he is the coordinator of the International Agreement with the BBSR – German Federal Institute for Research on Building, Urban Affairs, and Spatial Development.

# TECHNICAL PROGRAM

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The text suggests that a consistent and thorough record-keeping system is essential for identifying trends and making informed decisions.

In the second section, the author addresses the challenges of budgeting and financial planning. It notes that many businesses struggle to stay within their budgets due to unforeseen expenses or changes in market conditions. The document provides several strategies to mitigate these risks, such as creating a contingency fund and regularly reviewing the budget to adjust for any deviations.

The third part of the document focuses on the role of technology in modern accounting. It highlights how software solutions can streamline the accounting process, reduce errors, and provide real-time insights into the company's financial health. The text encourages businesses to invest in reliable accounting software and to ensure that their staff is properly trained to use these tools effectively.

Finally, the document concludes by discussing the importance of transparency and communication in financial management. It stresses that clear communication with stakeholders, including investors and creditors, is crucial for building trust and ensuring the long-term success of the business. The author advises businesses to provide regular financial reports and to be open to feedback and suggestions from their partners.

## Wednesday, June 21

Wednesday, June 21 8:30 - 10:00

### BD 1: Decarbonization strategies in buildings

Room: BRAČ 1

Chair: Theodoros Theodosiou, Aristotle University of Thessaloniki

#### **Weights of embodied energy and carbon emissions in an energy retrofit of the building envelope: Assessment for a Mediterranean residential building**

Teresa Iovane (Università degli Studi di Napoli Federico II, Italy); Fabrizio Ascione and Nicola Bianco (Università degli studi di Napoli Federico II, Italy); Margherita Mastellone (Università degli Studi di Napoli Federico II, Italy); Manuela Almeida and Ricardo Mateus (University of Minho Guimarães Portugal, Portugal)

#### **From consumers to prosumers: the rise of Energy Communities and their role in the energy transition**

Giuseppe Aruta (Università degli Studi di Napoli Federico II, Italy); Fabrizio Ascione (Università degli studi di Napoli Federico II, Italy); Nicola Bianco (University of Naples, Italy); Luisa Bindi (University of Naples Federico II, Italy); Filippo De Rossi (Università degli Studi di Napoli Federico II, Italy); Giacomo Manniti (University of Naples Federico II, Italy)

#### **Identifying Promising Domains of Decarbonization Technologies: an Improved Methodology**

Paulo Moisés Almeida Costa (ESTGV & ESTGV - IPV, Portugal); Paulo Tomé (Travessa Príncipe Perfeito Lote B 17 A, Portugal); Bruno F. C. Almeida (IPV & ESTGV, Portugal); Nuno Bento (Instituto Universitario de Lisboa (ISCTE-IUL), DINAMIA/CET, Portugal); António Costa Duarte (ESTGV, Portugal)

#### **Analysis of energy standards for low-income housing throughout the 21st century: A focus on reducing cooling loads in Mexico**

Claudia Eréndira Vázquez-Torres (Autonomous University of Yucatán, Mexico); José Gabriel Hernández-Pérez, Bassam Ali and Luis Ricalde Castellanos (Autonomous University of Yucatan, Mexico)

#### **Social housing as an open issue of energy consumption in the building sector in Europe: a case study in Berlin**

Fabrizio Ascione and Nicola Bianco (Università degli studi di Napoli Federico II, Italy); Olaf Böttcher (Federal Institute for Research on Building Urban Affairs and Spatial Development, Germany); Aniello Cappiello and Margherita Mastellone (Università degli Studi di Napoli Federico II, Italy); Gerardo Maria Mauro (Università degli studi del Sannio, Italy); Jana Muhle (Federal Institute for Research on Building Urban Affairs and Spatial Development, Germany); Francesco Tariello (Università degli studi del Molise, Italy)

Wednesday, June 21 8:30 - 10:00

### E1: Energy systems and processes I

Room: BRAČ 2

Chair: Ankica Kovač, University of Zagreb

#### **Design and analysis of a solid oxide fuel cell based novel polygeneration system with power-ejector refrigeration and multi-stage flash desalination**

Onder Kizilkcan (Isparta University of Applied Sciences, Turkey); Sandro Nizetic (University of Split, FESB, Croatia)

#### **Multi-Attribute Approach in Product Design during Group Decision Support Making Process**

Kresimir Osman (Zagreb University of Applied Sciences, Croatia); Mato Perić (University of North, Croatia)

#### **Energy analysis of microwave heating process of corn straw particles in a microwave chamber**

Longfei Cui, Wenke Zhao and Yaning Zhang (Harbin Institute of Technology, China)

#### **New energy storage design methods**

Aneta Kalbarczyk (Warsaw University of Technology & Solid Energy Group, Poland); Aldona Zalewska and Michał Marzantowicz (Warsaw University of Technology, Poland); Michał Kalbarczyk (Solid Energy Group Sp z o.o. Elk, Poland)

#### **Towards a Smart Operation - Novel Grey-box Modelling of Ultra-low Temperature Freezing Chambers**

Tao Huang, Peder Bacher and Jan Kloppenborg Møller (Technical University of Denmark, Denmark)

#### **A novel approach to efficient biodiesel production using waste cooking oil**

Marina Corral-Bobadilla and Ruben Lostado-Lorza (University of La Rioja, Spain); Fátima Somovilla-Gómez (Universidad de La Rioja, Spain); Saúl Iñiguez Macedo and Celia Sabando-Fraile (University of La Rioja, Spain)

#### **Securing electrical energy in the case of climate extremes and natural disasters**

Ankica Kovač, University of Zagreb



(Universidad de La Rioja, Spain); Saúl Iñiguez Macedo and Celia Sabando-Fraile (University of La Rioja, Spain)

**Wednesday, June 21 8:30 - 10:00**

**EM1: Engineering modelling**

Room: VIS

Chair: Ivica Galić, University of Zagreb

***New analytic model for torsion with shear influence of thin-walled composite beams with symmetrical open sections***

Marko Vukasović, Branka Bužančić Primorac and Karla Delić (University of Split, Croatia)

***Eccentric compressive load on short pultruded wide flange beam***

Radoslav Pavazza, Frane Vlak, Marko Vukasović and Branka Bužančić Primorac (University of Split, Croatia)

***An Efficient Stochastic Modeling of Transmitted Power Density in Two-layered Planar Tissue Exposed to Incident Plane Wave***

Anna Sušnjara (University of Split & FESB, Croatia); Dragan Poljak (University of Split, Croatia); Marin Galić (Centar za Mjerenja u Okolisu, Croatia)

***Wireless Power Transfer by using Thin Wire Antennas Case of Dipole Antennas in Free Space***

Dragan Poljak (University of Split, Croatia)

***Some Notes on Tesla Coil Design and Power Transfer Performances***

Zoran Blažević (University of Split, Croatia)

**Wednesday, June 21 8:30 - 10:00**

**IoT1: Session on IoT-aware Solutions and Research projects on One-Health and Safety ecosystems**

Room: HVAR

Chair:Luigi Patrono, University of Salento

***ElectroSense: a Low-cost Wearable Potentiostat for Real-time Monitoring of Glucose Level***

Antonio V Radogna (University of Salento, Italy); Luca Francioso (CNR- Institute for Microelectronics and Microsystems, Italy); Elisa Sciurti, Daniele Bellisario and Vanessa Esposito (CNR-IMM, Italy); Giuseppe Grassi (University of Salento, Italy)

***Design and development of an IoT learning system for health-related applications***

Milovan Medojevic (The Institute for Artificial Intelligence Research and Development of Serbia & EnergyPulse DOO, Serbia); Marko Vasiljević-Toskić (University of Novi Sad, Serbia); Dubravko Culibrk (The Institute for Artificial Intelligence Research and Development of Serbia, Serbia); Petar Solic (University of Split & FESB, Croatia); Toni Perkovic (University of Split, FESB, Croatia); Milana Medojevic (University of Novi Sad, Serbia)

***Evaluation of a Teleemergency Service for Older People Living at Home: A Study Protocol***

Elena Casabona (University of Turin, Italy); Sara Campagna and Paola Di Giulio (University of Torino, Italy); Valerio Dimonte (Università degli Studi di Torino, Italy); Angela Castello (University of Torino, Italy); Dante Viotti (G. Agnelli Ville Roddolo Nursing Home, Italy)

***An IoT-aware system for remote monitoring of patients with chronic heart failure***

Ilaria Sergi, Teodoro Montanaro and Angela-Tafadzwa Shumba (University of Salento, Italy); Alessia Bramanti, Michele Ciccarelli and Albino Carrizzo (University of Salerno, Italy); Paolo Visconti (University of Salento, Italy); Massimo De Vittorio (Istituto Italiano di Tecnologia, Italy); Luigi Patrono (University of Salento, Italy)

***An IoT-based Platform for Remote Monitoring of Patients with Heart Failure: an Overview of Integrable Devices***

Ilaria Sergi, Teodoro Montanaro, Angela-Tafadzwa Shumba, Roberto de Fazio, Paolo Visconti and Luigi Patrono (University of Salento, Italy)

***Advising chatbot for high school in smart cities***

Suha Khalil Assayed and Manar Alkhatib (The British University in Dubai, United Arab Emirates); Khaled F. Shaalan (The British University in Dubai & Cairo University, United Arab Emirates)

### **Advancing Sustainability Impact Assessment: A Comprehensive Tool for Low Emissions Zone Management**

Eduardo Illueca Fernandez (Department of Informatics and Systems University of Murcia, Spain), Noel Gomariz Kuhne (Research and Development Department Libelium Murcia, Spain), Nuria Bernabe Mulero (Department of Informatics and Systems University of Murcia, Spain) and Antonio J. Jara (Research and Development Department Libelium Murcia, Spain)

**Wednesday, June 21 8:30 - 10:00**

**RFID1: Special Session on RFID and IoT electronic and electromagnetic augmented devices and systems for sustainability, wellness, industry, and safety**

Room: KORČULA

Chair: Andrea Ria - University of Pisa and Francesco P. Chietera - University of Salento

#### ***RFID Portable System For Sensing Applications***

Sonia Gomez and Almudena Rivadeneyra (University of Granada, Spain); José F. Salmerón (University of Granada & ECSens, Spain); Victor Toral and Francisco Romero (University of Granada, Spain)

#### ***Self-sensing antenna for soil moisture***

Maja Skiljo and Roko Radanović (University of Split, Croatia); Toni Perkovic (University of Split, FESB, Croatia); Zoran Blažević (University of Split, Croatia); Petar Solic (University of Split & FESB, Croatia)

#### ***An IoT sensor platform for LED-based optical spectroscopy***

Andrea Ria, Andrea Motroni, Francesco Gagliardi, Massimo Piatto and Paolo Bruschi (University of Pisa, Italy)

#### ***Robot-based UHF-RFID joint SAR localization and tag sensing***

Andrea Motroni, Andrea Ria, Glauco Cecchi and Paolo Nepa (University of Pisa, Italy)

#### ***Extracting the ID Code of a Time/Frequency Chipless-RFID Tag with Only One Power Splitter Output***

Amirhossein Karami-Horestani (CIMITEC, Departament d'Enginyeria Electrònica & Universitat Autònoma de Barcelona, Spain); Ferran Paredes (Universitat Autònoma de Barcelona, Spain); Ferran Martín (Universitat autònoma de Barcelona, Spain)

#### ***Exploring the Potential of Bluetooth Low Energy for Wireless Sensing and On-Board Computation in Remote Health Monitoring***

Petar Solic (University of Split, FESB, Croatia), Riccardo Colella (University of Salento, Lecce, Italy / National Research Council, Institute of Clinical Physiology, Research Unit of Lecce, via Monteroni, Lecce, Italy), Toni Perkovic (University of Split, FESB, Croatia), Carlo Giacomo Leo, Saverio Sabina (National Research Council, Institute of Clinical Physiology, Research Unit of Lecce, via Monteroni, Lecce, Italy / MOVE-mentis s.r.l., Cesena, Italy) and Luca Catarinucci (University of Salento, Lecce, Italy)

**Wednesday, June 21 8:30 - 10:00**

**SC1: Smart City I**

Room: ŠOLTA

Chair: Marin Bugarić, University of Split

#### ***Presentation and comparison of methods for evaluating the recyclability of electrotechnical products***

Krešimir Osman (Zagreb University of Applied Sciences, Croatia); Josip Pranjić (ETI Group, Croatia); Trpimir Alajbeg (Zagreb University of Applied Sciences, Croatia); Mato Perić (University of North, Croatia)

#### ***A Standards-based Approach for Cross-Domain Modelling of Smart City System Architectures***

Goran Lastro (Salzburg University of Applied Sciences, Austria); Jounes-Alexander Gross DI (University of Applied Science Salzburg, Austria); Christian Neureiter (Salzburg University of Applied Sciences, Austria)

#### ***Smart and Urban Innovation Policies' Risks of Gentrification: a Focus on Venice***

Brian Franco Guilhelm Fabregue (University of Zurich & Retreeb Company, Switzerland)

#### ***Towards an automated security-by-design approach in automotive system-of-systems architectures***

Boris Brankovic (University of Applied Sciences Salzburg, Austria); Katharina Polanec (Salzburg University of Applied Sciences, Austria)

#### ***Respiratory Disease Detection through Spectrogram Analysis with Explainable Deep Learning***

Francesco Mercaldo and Antonella Santone (University of Molise, Italy); Fabio Martinelli (CNR-IIT, Italy); Mario Cesarelli (University of Napoli, Italy); Luca Brunese (University of Molise, Italy)

**Modelling a Big Data-based Analytical Process: an Aerospace Case Study**

Angelo Corallo (Italy); Francesco Otello Buccoliero, Anna Maria Crespino, Vito Del Vecchio and Marianna Lezzi (University of Salento, Italy); Alessandra Spennato (Università del Salento, Italy)

**Wednesday, June 21 11:00 - 12:30**

**BD2: Energy efficiency in buildings**

Room: BRAC 1

Chair: Paris Fokaides, Frederick University

**Sensitivity analysis about the effectiveness of the energy efficiency measures for residential building under the Italian incentive opportunities**

Antonio Gigante (University of Sannio, Italy); Rosa Francesca De Masi (Università degli Studi del Sannio, Italy); Valentino Festa (University of Sannio, Italy); Silvia Ruggiero (Università degli Studi del Sannio, Italy); Alessandro Russo and Michele Parrotta (University of Sannio, Italy)

**Improving the cooling performance of an Opaque Ventilated Facade using an Airflow Network Model for the Mediterranean climate**

Aikaterina Karanafti, Theodoros Theodosiou and Katerina Tsikaloudaki (Aristotle University of Thessaloniki, Greece)

**Comparative Analysis of Energy Efficiency Policies for Existing Building by Countries**

Suin Lee (Korea Institute of Civil Engineering and Building Technology, Korea (South)); Jae-Sik Kang (Korea Institute of Civil Engineering and Building Technology(KICT), Korea (South)); Hyun-Jung Choi and Hosang Ahn (Korea Institute of Civil Engineering and Building Technology, Korea (South))

**Simulation of EU building stock energy performance through artificial neural networks**

Ana Veljkovic (European Commission, Joint Research Centre, Italy); Daniel A. Pohoryles and Dionysios A. Bournas (European Commission Joint Research Centre, Italy)

**Wednesday, June 21 11:00 - 12:30**

**E2: Renewable energy systems and energy technologies**

Room: BRAC 2

Chair: Efrosini Giama, Aristotle University of Thessaloniki

**Photovoltaic-thermal system coupled with ice bank**

Mišo Jurčević, Sandro Nizetic and Ivan Čorić (University of Split, FESB, Croatia); Muslum Arici (Kocaeli University, Turkey); Efrosyni Giama and Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece)

**Optimal Land Suitability Based on GIS Tools for Solar PV Farms**

Kacem Gairaa (URAER EPST CDER, Algeria); Mawloud Guermoui (University of Batna, Algeria); Mohammed Zaiani, Sabrina Belaid and Said Benkacali (URAER EPST CDER, Algeria)

**Analysis of PV and EV Chargers Integration Impact on Radial LV Distribution Network**

Marina Dubravac, Zvonimir Šimić and Danijel Topić (J. J. Strossmayer University of Osijek, Croatia); Goran Knežević and Kresimir Fekete (FERIT Osijek, Croatia)

**A Sizing and Techno-Economic Analysis for Local Hybrid Microgrid**

Marija Mandić (KONCAR - Electrical Engineering Institute Ltd. & University of Zagreb, Croatia); Motalleb Miri, Mario Barišić and Iva Popović (KONCAR - Electrical Engineering Institute Ltd., Croatia)

**Modification and testing of the microinverter development kit for the purpose of connecting the battery system**

Luka Šimunović and Danijel Jolevski (University of Split, Croatia); Damir Jakus (University of Split & Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Croatia); Josip Vasilj (University of Split, Croatia)

**Frosting performances of the metal heat-transfer surface for the air-source heat pump in Harbin**

Xiaoya Cao, Wenke Zhao, Yaning Zhang and Kaihan Xie (Harbin Institute of Technology, China)

**Wednesday, June 21 11:00 - 12:30**

**EM2: Engineering modelling II**

Room: BRAC 2

Chair: Ruben Lostado-Lorza, University of La Rioja

***Pipeline risk factors analysis using the Pierce correlation coefficient method and the random forest importance factor method***

Ziqing Ning, Bohong Wang, Shicheng Li and Xiaoye Jia (Zhejiang Ocean University, China); Shuyi Xie (Tubular Goods and Equipment Materials CNPC Tubular Goods Research Institute, China); Jianqin Zheng (China University of Petroleum, China)

***Modal and experimental analysis of floating floors***

Mario Malić, Zeljan Lozina, Damir Sedlar and Josipa Sarac (University of Split, Croatia)

***Measurement of sound transmission loss of floating floors***

Josipa Sarac, Damir Sedlar, Mario Malić and Zeljan Lozina (University of Split, Croatia)

***Design and control based on the concept of an inverted pendulum***

Damir Sedlar (University of Split, Croatia); Andrea Bosnjak (FESB, Croatia)

***Generalized finite difference method and advective problems***

Zeljan Lozina and Damir Sedlar (University of Split, Croatia)

***A Prediction Approach for Small Healthcare Dataset***

Nuha Ahmed Salman (Babylon, Iraq); Saad Talib Hasson (University of Babylon & College of Information Technology, Iraq)

**Wednesday, June 21 11:00 - 12:30**

**IoT2: Special Session on Cybersecurity and IoT**

Room: HVAR

Chair: Luca Mannella, Politecnico di Torino

***FeDef: A Federated Defense Framework Using Cooperative Moving Target Defense***

Chao Feng (University of Zurich, Switzerland); Jan von der Assen (University of Zurich UZH, Switzerland); Alberto Huertas Celdrán (University of Zürich UZH, Switzerland & University of Murcia, Spain); Steven Naf (University of Zurich, Switzerland); G erome Bovet (Armasuisse, Switzerland); Burkhard Stiller (University of Zurich, Switzerland)

***Watching against the Unseen: AI-powered Approach to Detect Attacks on Critical Infrastructure***

Domenico Lof  (Polytechnic University of Bari, Italy); Andrea Paziienza, Agostino Abbatecola, Eufemia Lella, Nicola Macchiarulo and Pietro Noviello (Exprivia SpA, Italy)

***A Gateway-based MUD Architecture to Enhance Smart Home Security***

Fulvio Corno and Luca Mannella (Politecnico di Torino, Italy)

***Digital Forensics Investigation Models: Current State and Analysis***

Malinka Ivanova and Svetlin Stefanov (Technical University of Sofia, Bulgaria)

***Exploiting the DICE specification to ensure strong identity and integrity of IoT devices***

Enrico Bravi, Silvia Sisinni and Antonio Lioy (Politecnico di Torino, Italy)

***Improving the Robustness of DNNs-based Network Intrusion Detection Systems through Adversarial Training***

Eufemia Lella, Nicola Macchiarulo and Andrea Paziienza (Exprivia SpA, Italy); Domenico Lof  (Polytechnic University of Bari, Italy); Agostino Abbatecola and Pietro Noviello (Exprivia SpA, Italy)

**Wednesday, June 21 11:00 - 12:30**

**RFID2: IEEE-CRFID Workshop on Flexible and Printable Technologies in Electronics and Electromagnetics (WFPE)**

Room: KOR ULA

Chair: Luca Catarinucci - University of Salento and Riccardo Colella - University of Salento

**Addressing the Effects of UHF RFID Tag Crumpling**

Kevin Neumann (AirCode UG, Germany); Daniel Erni (University of Duisburg-Essen, Germany); Niels Benson (AirCode, Germany)

**Tensile strength, elastic modulus and thermal conductivity of 3D-Printed components using bronze/PLA filament**

Marina Corral-Bobadilla, Ruben Lostado-Lorza and Saúl Iñiguez Macedo (University of La Rioja, Spain); Fátima Somovilla- Gómez (Universidad de La Rioja, Spain); Celia Sabando-Fraile (University of La Rioja, Spain)

**Upper Bound Performance s of Laser-Induced Graphene Dipoles in the UHF Band**

Alessio Mostaccio, Gaetano Marrocco and Gianni Antonelli (University of Rome Tor Vergata, Italy); Eugenio Martinelli (Tor Vergata University of Rome, Italy); Andrea Salvia (University of Roma Tor Vergata, Italy)

**Wideband 3D-Printed Cylindrical DRAs Exploiting Customizable Permittivity Variation in Radial Direction**

Francesco P. Chietera (University of Salento, Italy); Riccardo Colella (University of Salento, Italy & National Research Council (CNR), Italy); Luca Catarinucci (University of Salento, Italy)

**Textile-Based Game Controller Platform Through Combination of Bluetooth and Passive UHF RFID**

Asif Shaikh (Tampere University, Finland); Sari Merilampi and Mirka Leino (Satakunta University of Applied Sciences, Finland); Shiva Jabari, Oguz Buruk, Juho Hamari and Johanna Virkki (Tampere University, Finland)

**Lens Antenna Design Tool Based on Generalized Supershape d Formula: Preliminary Results**

Alberto Facchini (Université Jean Monnet Saint-Etienne, France); Francesco P. Chietera (University of Salento, Italy); Riccardo Colella (University of Salento, Italy & National Research Council (CNR), Italy); Luca Catarinucci (University of Salento, Italy); Pietro Bia (Elettronica Group, Italy); Luciano Mescia (Polytechnic University of Bari, Italy)

**Wednesday, June 21 11:00 - 12:30**

**SC2: Smart City II**

Room: SOLTA

Chair: Marin Bugarić, University of Split

**Multi-objective Decision Support Tool for Sustainable Livestock Farming**

Kamrul Islam Shahin (University of Southern Denmark, Denmark); Sanja Lazarova-Molnar (Karlsruhe Institute of Technology, Germany & University of Southern Denmark, Denmark); Parisa Niloofar (University of Southern Denmark, Denmark)

**Smart sustainable daily life: Insights from across the social sciences**

Emilie L Vrain and Charlie Wilson (University of Oxford, United Kingdom (Great Britain))

**Sustainability driven MaaS for rural areas**

Ophelia Prillard (SINTEF Digital, Norway); Amela Karahasanovic (SINTEF, Norway); Alma Leora Culén (University of Oslo, Norway)

**Development of Digital Competence Framework for Open Science**

Neven Pintarić (University of Zadar, Croatia); Zeljka Tomasovic (University of Pula, Croatia)

**ML-based Minimization of AoI in a Vehicular Communication Network**

Suresh Chavhan (Indian Institute of Information Technology Raichur, India); Joel J. P. C. Rodrigues (Senac Fac of Ceará, Brazil & Instituto de Telecomunicações, Portugal); Prarthana Prabhakaran and Manish Kumar (Vellore Institute of Technology, India)

**Detection of Smart Grids Instability with Convolutional Neural Networks and Global Explainability**

Francesco Mercaldo (University of Molise, Italy); Fabio Martinelli (CNR-IIT, Italy); Antonella Santone (University of Molise, Italy)

**Wednesday, June 21 14:30 - 16:00**

**E3: Energy efficiency and energy modelling**

Room: BRAC 2

Chair: Yee Van Fan, Brno University of Technology

***Thermal optimization of 3D-printed block - Hot Box and heat flow meter experimental analysis***

Tullio de Rubeis (University of L'Aquila, Italy); Annamaria Ciccozzi and Giovanni Pasqualoni (University of L'Aquila Italy, Italy); Domenica Paoletti and Dario Ambrosini (University of L'Aquila, Italy)

***Numerical Analysis of the Natural Ventilation in a Greenhouse Under Saharan Climate Conditions***

Salah Bezari (Applied Research Unit in Renewable Energies, Algeria); Mohamed Lebbi (Renewable Energies Applied Research Unit & University of Laghouat, Algeria); Ahmed Benchatti (University of Laghouat, Algeria); Azeddine Boutelhig (Applied Research Unit in Renewable Energies, Algeria)

***Modeling of Induction Fluid Heater via Transformer Equivalent Circuit***

Alper Kelesoglu (Yalova University, Turkey); Halil Unver (Kirikkale University, Turkey); Umit Unver (Yalova University, Turkey)

***Decarbonization trajectory in Cement Industry***

Juhi Kamra and Ambica Prakash Mani (Graphic Era Deemed to be University, India); V M Tripathi (Graphic Era Hill University, India)

***Day-ahead and intra-day forecasting of electric vehicle charging station energy consumption***

Daria Matković (University of Zagreb, Croatia); Tomislav Capuder (Zagreb, Croatia); Ivan Sudic (University of Zagreb, Croatia)

***Local Energy and Flexibility Markets: State of the art and technological gap analysis***

Stylianos Zikos (Centre for Research and Technology Hellas, Greece); Christos Malavazos and Ismini Dimitriadou (Hypertech S.A., Greece); Christos Timplalexis (Centre for Research and Technology Hellas, Greece); Gregorio Fernández (Fundacion CIRCE, Spain); Dimosthenis Ioannidis and Dimitrios Tzovaras (Centre for Research and Technology Hellas, Greece)

**Wednesday, June 21 14:30 - 16:00**

**EM3: Engineering modelling in energy systems**

Room: VIS

Chair: Dragan Poljak, University of Split

***Upscaling along-the-channel model to full-scale flow field for improved performance of PEM fuel cells***

Klara Bonković and Zeljko Penga (University of Split, Croatia); Gojmir Radica (University of Split, FESB, Croatia)

***Computational Fluid Dynamics study of the influence of number of channels on the performance of full-scale PEM fuel cell***

Toni Skorlić (M. Getaldića 13, Croatia); Zeljko Penga (University of Split, Croatia); Gojmir Radica (University of Split, FESB, Croatia)

***Numerical analysis of coolant flow field for maintaining the desired temperature profile along the PEM fuel cell***

Tino Vidović (University of Split, FESB, Croatia); Zeljko Penga (University of Split, Croatia); Jure Penga and Gojmir Radica (University of Split, FESB, Croatia); Ivan Tolj (University of Split, Faculty of Elect. Eng., Mech. Eng. and Naval Arch., Croatia); Jakov Šimunović (Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, Croatia)

***Methods and equipment for analysis and diagnostics of marine engines***

Petar Vrvilo (PFST, Croatia); Tino Vidović (University of Split, FESB, Croatia); Nikola Matulic (University of Split FESB, Croatia); Liane Roldo (PFST, Croatia); Gojmir Radica (University of Split, FESB, Croatia)

***Numerical Modelling of Radiative Heat Transfer in Heavy-Duty Engines for Improved Emission Predictions***

Tomislav Mučalo, Filip Jurić and Milan Vujanović (University of Zagreb, Croatia)

**Wednesday, June 21 14:30 - 16:00**

**IoT3: Session on IoT technologies and use cases**

Room: HVAR

Chair: Luigi Patrono, University of Salento

***An IoT-based Smart Agriculture Management System: Case Study in the Southern region of Senegal***

Alioune Cisse, Ousmane Diallo and EL Malick Hadji Ndoeye (University of Assane Seck of Ziguinchor, Senegal); Joel J. P. C. Rodrigues (Senac Fac of Ceará, Brazil & Instituto de Telecomunicações, Portugal); Mamadou Sy (University of Assane Seck of Ziguinchor, Senegal)

***A Microservice-based Software Architecture to Enhance Collaboration among heterogeneous stakeholders operating in the Research Domain***

Giuseppe Del Fiore, Teodoro Montanaro and Ilaria Sergi (University of Salento, Italy); Nico Cardone (InfoTech Consults di Cardone Nico, Italy); Luca Matino (InfoTechConsults, Italy); Luigi Patrono (University of Salento, Italy)

***The combined use of IoT and Blockchain in Logistics: a comparative experiment***

Teodoro Montanaro, Ilaria Sergi and Andrea Quarta (University of Salento, Italy); Mikel Emaldi (Deusto Institute of Technology - DeustoTech, University of Deusto, Spain); Nekane Sainz (University of Deusto, Spain); Diego López-de-Ipiña (Deusto Institute of Technology - DeustoTech, University of Deusto, Spain); Luigi Patrono (University of Salento, Italy)

***A context-aware multiple Blockchain architecture for managing low memory device***

Marco Fiore, Marina Mongiello and Giuseppe Acciani (Politecnico di Bari, Italy)

***Leveraging Internet of Things and Distributed Ledger Technology for Cold Chain Management in Freight Transportation*** Valeria Vergine, Ilaria Sergi, Teodoro Montanaro and Angela-Tafadzwa Shumba (University of Salento, Italy); Fabrizio Benvenuto (Commedia srl); Luigi Patrono (University of Salento, Italy)

***Evaluation of passive OS fingerprinting methods using TCP/IP fields***

Matej Hulák (Czech Technical University in Prague, Czech Republic); Václav Bartoš (CESNET, Czech Republic); Tomas Cejka (CESNET & CTU in Prague, FIT, Czech Republic)

**Wednesday, June 21 14:30 - 16:00**

**RFID3: Wearable, conformal and flexible antennas for RFID/IoT**

Room: KORČULA

Chair: Andrea Casula - University of Cagliari and Will Whittow - University of Loughborough

***A Dual-Band Textile Eighth Mode SIW Antenna for Wearable Applications***

Giovanni Andrea Casula (Università di Cagliari, Italy); Giorgio Montisci and Giacomo Muntoni (University of Cagliari, Italy)

***Comparison of Screen- and Inkjet-Printed Meshed Wideband Antennas for Conformal IoT Applications***

Nicolas Claus (Ghent University & Imec, Belgium); Jo Verhaevert (Ghent University - imec, Belgium); Hendrik Rogier (Ghent University, Belgium)

***Punch-Needle Passive UHF RFID Tag Dipole Antennas - Design, Fabrication, and Initial Wireless Evaluation***

Tiina Vuohijoki and Asif Shaikh (Tampere University, Finland); Sari Merilampi (Satakunta University of Applied Sciences, Finland); Tiina Ihalainen and Johanna Virkki (Tampere University, Finland)

***A Textile-Based Wireless Power Transfer System Made of Slot Yagi-Uda Antennas for Wearable and Sensor Applications*** Dieff Vital (The University of Illinois Chicago, USA)

***Minimally invasive battery-less microcontroller enabled implantable NFC tag for healthcare sensing applications***

Paul Taylor and John Batchelor (University of Kent, United Kingdom (Great Britain))

***Conformal Millimeter-Wave Corrugated Substrate Integrated Waveguide Slot Array Antenna***

Aakash Bansal, Chinthana J Panagamuwa and William Whittow (Loughborough University, United Kingdom (Great Britain))

**Wednesday, June 21 14:30 - 16:00**

**SML1: Symposium Statistics and ML in Electronics**

Room: ŠOLTA

Chair: prof. Stefan Hensel, Offenburg University

***Hand Gesture Recognition System with Finite State Machine for Remote Desktop Control***

Robert Noparlić and Rafal Zdunek (Wroclaw University of Science and Technology, Poland)

***Optimization of Bowl Feeders Structure for Arbitrary Parts with Machine Learning***

Marin B. Marinov (Technical University of Sofia, Bulgaria)

***Methods for Analysis of Manufacturing Process in Electronics***

Malinka Ivanova, Nikolay Petkov and Roumiana Ilieva (Technical University of Sofia, Bulgaria)

***Literature review of key performance indicators for Supplier Quality Management in Automotive Electronics Industry*** Petya Tihomirova Petkova (Technical University of Sofia, Bulgaria); Milena Petkova

(University of Library Studies and Information Technologies Sofia, Bulgaria); Boyan Jekov and Eugenia Kovatcheva (ULSIT, Bulgaria)

**Applications of deep learning and artificial intelligence methods to smart edge devices and stereo cameras**  
Mauro Mazzei and Cosmo Capodiferno (CNR, Italian National Research Council IASI, Institute of Systems Analysis and Computer Science, Italy)

**Wednesday, June 21 17:00 - 18:30**

**BD3: Nzeb and high-performance buildings**

Room: BRAC 1

Chair: Agis Papadopoulos, Aristotle University of Thessaloniki

**Impact of glazing system on the energy performance of a nZEB under climate change scenarios**

Antonio Gigante (University of Sannio, Italy); Rosa Francesca De Masi (Università degli Studi del Sannio, Italy); Michele Parrotta (University of Sannio, Italy); Nicoletta Del Regno (Università Degli Studi del Molise, Italy); Silvia Ruggiero (Università degli Studi del Sannio, Italy); Giuseppe Peter Vanoli (Università degli studi del Molise, Italy)

**H2 micro-cogeneration in buildings: from nZEBs to HZEBs. State of Art, with a novel experimental set-up**

Fabrizio Ascione (Università degli studi di Napoli Federico II, Italy); Valentino Festa (University of Sannio, Italy); Giacomo Manniti (University of Naples Federico II, Italy); Silvia Ruggiero (Università degli Studi del Sannio, Italy); Francesco Tariello and Giuseppe Peter Vanoli (Università degli studi del Molise, Italy)

**Practical challenges towards data-driven applications in buildings: lessons-learned from two real-life case studies**

John Clauß, Luis Caetano and Kristian Stenerud Skeie (SINTEF Community, Norway); Åsmund Bror Svinndal (Kiona AS, Norway)

**Innovative Construction Typologies for Ventilated Façades in the Mediterranean Region**

Panagiota Antoniadou and Georgios Chantzis (Aristotle University of Thessaloniki, Greece); Ifigeneia Theodoridou (International Hellenic University, Greece); Aikaterini Christodoulou (E2 Architects Thessaloniki, Greece); Maria Symeonidou (Aristotle University Thessaloniki, Greece); Elli Kyriaki and Effrosyni Giama (Aristotle University of Thessaloniki, Greece); Stella Chadiarakou and Michael Kontos (Fibran SA, Greece); Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece); Sofia-Natalia Boemi (University of Thessaloniki, Greece)

**Wednesday, June 21 17:00 - 18:30**

**E4: Energy systems and processes II**

Room: BRAC 2

Chair: Pawel Oclon, Cracow University of Technology

**Experimental study on the thermochemical reduction of supercritical CO<sub>2</sub> by guaiacol**

Hui Jin, Jiadela Kuanibieke and Yimeng Wei (Xian Jiaotong University China, China)

**Vapor-liquid equilibrium of H<sub>2</sub>/CO<sub>2</sub> and H<sub>2</sub>/N<sub>2</sub>/CO<sub>2</sub> mixture, the liquefaction technology related to the supercritical water gasification products**

Hui Jin (Xian Jiaotong University China, China); Hongtu Wu (Xi'an Jiaotong University, China)

**Design and evaluation of an innovative double-flash geothermal power plant combined with reheat tCO<sub>2</sub> Rankine cycle, Kalina cycle, desalination and H<sub>2</sub> generation**

Serpil Celik-Toker (Isparta University of Applied Sciences Isparta Turkey, Turkey); Onder Kizilkan (Isparta University of Applied Sciences, Turkey); Sandro Nizetic (University of Split, FESB, Croatia)

**Modified diatomite materials and their environmental application as a sorbent for inorganic ions**

Michał Łach (Cracow University of Technology, Poland); Tomasz Bajda (AGH University of Science and Technology, Poland); Magdalena Szechyńska-Hebda (W. Szafer Institute of Botany Polish Academy of Sciences, Poland); Marek Hebda (Cracow University of Technology, Poland)

**Valorization of corn straw for liquid hydrocarbon production via catalytic pyrolysis coupled with Phanerochaete chrysosporium pretreatment**

Jiapeng Wang (SEU, China); Yaning Zhang (Harbin Institute of Technology, China)



**Wednesday, June 21 17:00 - 18:30**

**EM4: Engineering modelling III**

Room: VIS

Chair: Dragan Poljak, University of Split

***Computational Electromagnetics with the RBF-FD Method***

Andrej Kolar-Požun and Gregor Kosec (Jožef Stefan Institute, Slovenia)

***Edge Detection Using Vector Quantization And Local Entropy Measures Applied To Spectrogram***

***Component Extraction*** Matej Abramović, Zeljka Tomasovic and Nicoletta Saulig (University of Pula, Croatia); Ivan Marasović (University, Croatia)

***Simple Dosimetry Procedure for Human Exposure to a Field Radiated by a Vertical Dipole Antenna Above Lossy Half Space \*Part 2: Calculation of Transmitted Power Density***

Enida Cero Dinarević (FESB, Bosnia and Herzegovina); Dragan Poljak (University of Split, Croatia); Vicko Doric (University of Split, FESB, Croatia)

***A Developed Traffic Light Approach to Control Road Congestions in VANETS***

Randa Mahdi Kadhim (University of Babylon, Iraq); Saad Talib Hasson (University of Babylon & College of Information Technology, Iraq)

**Wednesday, June 21 17:00 - 18:30**

**IoT4: Session on BigData and Machine Learning Applications**

Room: HVAR

Chair: Teodoro Montanaro, University of Salento

***Augmenting Monitoring Infrastructure For Dynamic Software-Defined Networks***

Jaroslav Pešek and Richard Plný (Czech Technical University in Prague, Czech Republic); Josef Koumar (Czech Technical University in Prague - FIT, Czech Republic & CESNET, Czech Republic); Kamil Jerábek (Brno University of Technology, Czech Republic); Tomas Cejka (CESNET z. s. p. o., Czech Republic)

***Nudging: a double-edged sword in the era of Big Data***

Brian Franco Guilhelm Fabregue (University of Zurich & Retreeb Company, Switzerland); Andrea Bogoni (University of Bergamo, Italy)

***Towards a Method for Evaluating Realism of Randomly Generated Models of IT Systems***

Ivan Kovačević (University of Zagreb & Innovation Centre Nikola Tesla, Croatia); Stjepan Gros (University of Zagreb, Croatia)

***Obfuscated JavaScript Code Detection using Machine Learning with AST-based syntactic and lexical analysis***

Eren Kilic (Istanbul Technical University & ASELSAN, Turkey); Mehmet Tahir Sandikkaya (Istanbul Technical University, Turkey)

***Akats: A System for Resilient Deployments on Edge Computing Environments Using Federated Machine Learning Techniques***

Josu Díaz-de-Arcaya and Ana Isabel Torre-Bastida (TECNALIA, Basque Research and Technology Alliance (BRTA), Spain); Lander Bonilla and Juan López-De-Armentia (Tecnalia, Basque Research and Technology Alliance (BRTA), Spain); Raúl Miñón (TECNALIA, Basque Research and Technology Alliance (BRTA), Spain); Gorka Zarate (TECNALIA, Basque Research & Technology Alliance (BRTA), Spain); Aitor Almeida (DeustoTech - Deusto Institute of Technology, Spain)

***BLE-based IoT Proximity Warning System for Guaranteeing the Operators' Safety in Outdoor Working Environments*** Teodoro Montanaro, Ilaria Sergi, Angela-Tafadzwa Shumba and Marco Pizzolante (University of Salento, Italy); Marco Pirozzi (INAIL, Italy); Luigi Patrono (University of Salento, Italy)

**Wednesday, June 21 17:00 - 18:30**

**RFID4: Future Trends of RFID Technology for Society and Industry Toward green IoT Devices**

Room: KORČULA

Chair: Alice Buffi - University of Pisa and Arnaud Vena - University of Montpellier

***The MONITOR Robot with UHF-RFID Rotating Antennas enhancing Indoor Tag Localization***

Glauco Cecchi, Andrea Motroni, Alice Buffi and Paolo Nepa (University of Pisa, Italy); Salvatore D'Avella (Sant'Anna School of Advanced Studies & Mechanical Intelligence Institute, Italy); Matteo Unetti and Paolo Tripicchio (Scuola Superiore Sant'Anna, Italy); Luca Del Col (Partitalia, Italy); Alfredo Salvatore (Sensor ID, Italy)

***Wireless BMS Architecture for Secure Readout in Vehicle and Second life Applications***

Fikret Basic, Claudia Laube, Patrick Stratznig and Christian Steger (Graz University of Technology, Austria); Robert Kofler (NXP Semiconductors Austria GmbH Co & KG, Austria)

***UHF RFID tags on paper based on capacitive coupling between bare die IC and antenna***

Arnaud Vena (University of Montpellier & Institut d'Electronique Et Des Systèmes (IES), France); Benjamin Saggin (University of Montpellier, France); Brice Sorli (University of Montpellier & IES, France)

***A Machine Learning-Enabled mmID-Sensor for High-Accuracy Orientation and DoA Estimation***

Marvin Joshi, Genaro Soto-Valle, Charles A Lynch III and Manos M. Tentzeris (Georgia Institute of Technology, USA)

***Enhancing Worker Safety in Unmanned Agricultural Environments through the Integration of RFID, RTK, UWB, and LIDAR: Insights from Research Projects***

Luca Catarinucci (University of Salento, Italy); Glauco Cecchi (University of Pisa, Italy); Francesco P. Chietera (University of Salento, Italy); Massimo Cecchini (Università degli Studi della Tuscia di Viterbo, Italy); Riccardo Colella (University of Salento, Italy & National Research Council (CNR), Italy); Roberto Gabrielli (University of Pisa, Italy); Luca Landi (University of Perugia, Italy); Leonardo Marrazzini (University of Pisa, Italy); Danilo Monarca (University of Tuscia, Italy); Teodoro Montanaro (University of Salento, Italy); Andrea Motroni and Paolo Nepa (University of Pisa, Italy); Luigi Patrono (University of Salento, Italy); Marco Pirozzi (INAIL, Italy); Daniele Puri (Italian Institute for Insurance Against Accidents at Work - INAIL, Italy); Pierluigi Rossi (University of Tuscia, Italy); Ilaria Sergi (University of Salento, Italy); Emanuele Tavanti (University of Pisa, Italy); Leonardo Vita (Italian Institute for Insurance Against Accidents at Work - INAIL, Italy)

**Wednesday, June 21 17:00 - 18:30**

**SML2: Symposium Statistics and ML in Electronics II**

Room: ŠOLTA

Chair: prof. Marin Marinov, Technical University of Sofia

***Steganography App Based on Local Colour Statistics***

Barbara Dzaja, Mirjana Bonkovic and Tonko Kovacevic (University of Split, Croatia); Ana Kuzmanić Skelin (Faculty of Electrical Engineering, Croatia)

***Learning Trajectory Tracking For An Autonomous Surface Vehicle In Urban Waterways***

Toma Sikora (University of Zagreb, Croatia); Jonathan Klein Schiphorst (Roboat, The Netherlands); Riccardo Scattolini (Politecnico di Milano, Italy)

***Digital Accessibility for People with Special Needs: Conceptual Models and Innovative Ecosystems***

Maya Dimitrova (IR-BAS, Bulgaria); Galina Bogdanova (Institute of Mathematics and Informatics at the Bulgarian Academy of Science, Bulgaria); Nikolay Noev (Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS), Bulgaria); Negoslav Sabev (IMI-BAS, Bulgaria); Georgi Angelov and Yassen Paunski (IR-BAS, Bulgaria); Aleksandar Krastev (Institut of Robotics, Bulgarian Academy of Sciences, Bulgaria); Mirena Todorova-Ekmekci (Institute of Ethnology and Folklore Studies with Ethnographic Museum Bulgarian, Bulgaria)

***Investigation of Different Hot Bar Soldering Modes for Obtaining Strong Solders by Statistical Methods***

Valentin Petrov Tsenev and Nedyalko Peshev (Technical University of Sofia, Bulgaria)

***Creating and storing 7D digital twins***

Radoslav Markov and Galina Bogdanova (Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences); Malinka Ivanova (Technical University of Sofia, Bulgaria)

**Thursday, June 22**

**Thursday, June 22 9:00 - 10:30**

**BD4: Energy and buildings**

Room: BRAČ 1

Chair: Muslum Arici, Kocaeli University

**Computational BIM method for automated insight into BREEAM credits achievement in the refurbishment evaluation process of an existing building**

Sanja Dubljević, Bojan Tepavčević and Aleksandar Andjelkovic (University of Novi Sad, Serbia)

**Indoor thermal environment and daylighting performance of a building containing PCM glazing curtain wall**  
Wanyu Hu, Yao Lu, Dong Li, Yuxin Ma, Xinpeng Yang and Chengjun Zhang (Northeast Petroleum University, China)

**Energy efficiency, resilience and sustainability: A trilemma for hospital buildings?**

Georgios Chantzis (Aristotle University of Thessaloniki, Greece); Sandro Nizetic (University of Split, FESB, Croatia); Muslum Arici (Kocaeli University, Turkey); Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece)

**Efficient Facade Envelope Layout with Novel Waste-Based Thermal Insulation to Lower Air-Conditioning Costs and Carbon Emissions**  
Saboor Shaik, Abin Roy, Aabid Hussain Shaik and Mohammed Rehaan Chandan (Vellore Institute of Technology, India); Muslum Arici (Kocaeli University, Turkey); Tabish Alam (Central Building Research Institute, India)

**Thursday, June 22 9:00 - 10:30**

**CS1: Citizen Science**

Room: VIS

Chair: DIEGO LÓPEZ-DE-IPÍÑA, Deusto Institute of Technology - DeustoTech, University of Deusto and Diego Casado-Mansilla, University of Deusto

**BeeMate the Game: A hunting treasure serious game for raising awareness and audience engagement in air pollution monitoring**

Marina Eirini Stamatiadou, Nikolaos Vryzas, Lazaros Vrysis and Charalampos Dimoulas (Aristotle University of Thessaloniki, Greece)

**The BeeMate: Air quality monitoring through crowdsourced audiovisual data**

Nikolaos Vryzas, Marina Eirini Stamatiadou, Lazaros Vrysis and Charalampos Dimoulas (Aristotle University of Thessaloniki, Greece)

**A Micro-volunteering Engine to drive crowd-measuring of Air Quality in Citizen Science**

Maite Puerta-Beldarrain (Universidad de Deusto, Spain); Oihane Gómez-Carmona (University of Deusto, Spain); Diego López- de-Ipiña (Deusto Institute of Technology - DeustoTech, University of Deusto, Spain); Diego Casado-Mansilla (University of Deusto, Spain); Alexandre Barco (Universidad de Deusto, Spain); Unai Hernández-Jayo and Javier Garcia-Zubia (University of Deusto, Spain)

**Long Short-Term Memory for Discharge Estimation in Coastal Neretva River**

Anna Maria Mihel and Nino Krvavica (University of Rijeka, Croatia); Jonatan Lerga (University of Rijeka, Croatia & University of Rijeka, Center for Artificial Intelligence and Cybersecurity, Croatia)

**Evaluating YOLOV5, YOLOV6, YOLOV7, and YOLOV8 in Underwater Environment: Is There Real improvement?**

Boris Gašparović (University of Rijeka, Croatia); Goran Mause (University of Rijeka, Faculty of Engineering & University of Rijeka, Center for Artificial Intelligence and Cybersecurity, Croatia); Josip Rukavina (Vektro doo, Croatia); Jonatan Lerga University of Rijeka, Croatia & University of Rijeka, Center for Artificial Intelligence and Cybersecurity, Croatia)

**Thursday, June 22 9:00 - 10:30**

**IoT5: Special Session on AI and Deep Learning applied to Smart environment**

Room: HVAR

Chair: Cosimo Distante, CNR

**Gulf Dialect Speech Recognition Using Neural Network**

Manar Alkhatib (The British University in Dubai, United Arab Emirates); Ashwaq Faisal (The United Arab

Emirates University, United Arab Emirates); Maen Almubarek (The British University in Dubai, United Arab Emirates); Mariam Alsuwaidi (Alsuwaidi, United Arab Emirates); Abdulrahman AlQaderi (The British University in Dubai, United Arab Emirates)

**Multi-Position Human Activity Recognition using a Multi-Modal Deep Convolutional Neural Network**

Aime Cedric Muhoza, Emmanuel Bergeret, Corinne Brdys and Francis Gary (Université Clermont Auvergne, France)

**Sentiment Analysis Using Bi-CARU with Recurrent CNN Models**

Ka-Hou Chan (Macao Polytechnic University, China)

**SpO2 Estimation Using Deep Neural Networks: A Comparative Study**

Maria Carla Gammariello, Ilaria Sergi, Teodoro Montanaro and Angela-Tafadzwa Shumba (University of Salento, Italy); Pier Luigi Mazzeo and Cosimo Distante (CNR, Italy); Luigi Patrono (University of Salento, Italy)

**Exploring the influence of motion estimation algorithm selection and its parameters on the quality of HEVC-encoded 4K drone footage**

Jakov Benjak (University of Zagreb, Croatia); Daniel Hofman (University of Zagreb & Faculty of Electrical Engineering and Computing, Croatia)

**Analysis of Sensor Data and Machine Learning Models for Gesture Recognition in Smart Toy Design**

Lea Dujic Rodić (FESB, University of Split, Croatia); Ivo Stancic (University of Split, Croatia); Duje Ćoko (University of Split, FESB, Croatia); Petar Solic (University of Split & FESB, Croatia)

**Thursday, June 22 9:00 - 10:30**

**RFID5: Artificial intelligence (AI)-enhanced edge sensing and decision-making for electromagnetic devices**

Room: KORČULA

Chair: Massimo Merenda - University of Reggio Calabria and Arcangelo Bruna - ST Microelectronics

**Dataset distillation as an enabling technique for on-device training in TinyML for IoT: an RFID use case**

Andrea Accettola (Università Mediterranea di Reggio Calabria, Italy); Massimo Merenda (University Mediterranea of Reggio Calabria, Italy)

**An Embedded EOG-based Brain Computer Interface System for Robotic Control**

Arcangelo Bruna (ST Microelectronics, Italy); Valeria Tomaselli and Oleksiy Chepyk (STMicroelectronics, Italy); Nadia Mammonè (Mediterranean University of Reggio Calabria, Italy); Giuseppe Ruggeri (University of Reggio Calabria, Italy); Maurizio Campolo and Francesco Morabito (University Mediterranea of Reggio Calabria, Italy)

**Efficient and Reconfigurable Directional Beam Steering in Phased Arrays using AI and Edge Computing**

Riccardo Colella (University of Salento, Italy & National Research Council (CNR), Italy); Massimo Merenda (University Mediterranea of Reggio Calabria, Italy); Luigi Spedicato (IISS "E. Mattei" Maglie, Italy); Riccardo Carotenuto (University "Mediterranea" of Reggio Calabria, Italy); Luca Catarinucci (University of Salento, Italy)

**A Synchronous Digital Phase Detector Architecture based on a Coarse Time-to-Digital Approach**

Antonello Florio (Politecnico di Bari, Italy); Claudio Talarico (Gonzaga University, USA); Gianfranco Avitabile and Giuseppe Coviello (Politecnico di Bari, Italy)

**Wearable Electromagnetic Sensor for Potassium Monitoring**

Domenico Caggiano and Claudio Maria Lamacchia (IAMATEK Srl, Italy); Gaetano Chimenti and Angela Ferraris (IAMATEK srl, Italy); Luciano Mescia (Polytechnic University of Bari, Italy)

**Capacitive Coupling for RFID-based Wireless Transcranial Link for Patient-Centric Medicine**

Federica Naccarata, Addolorata Grieco and Gaetano Marrocco (University of Rome Tor Vergata, Italy)

**Thursday, June 22 9:00 - 10:30**

**WF1: Wildfires Track**

Room: ŠOLTA

Chair: Marin Bugarić, University of Split and Ljiljana Šerić, University of Split

**Dead Fuel Moisture Content in Wildfire Propagation Potential Estimation for Split-Dalmatia County**

Darko Stipaničev (University of Split - Faculty of Electr. Eng., Mech. Eng. and Naval Arch., Croatia); Marin Bugarić (FESB University of Split, Croatia)

**Advancement of an Integrated Technological Platform for Wildfire Management through Edge Computing**

Lovorko Marić (Micro Digital, Croatia); Krishna Chandramouli (Venaka Treleaf, Germany); Maria I. Maslioukova and Georgia Christodoulou (Catalink Limited, Cyprus); Konstantinos Avgerinakis (Catalink Limited, Greece); Jose-Ramon Martinez-Salio (ATOS, Spain); Pavlos Kosmidis (Catalink Limited, Cyprus & National Technical University of Athens, Greece)

**Predicting catastrophic wildfires is crucial for confronting the European wildfire crisis**

Fermin Alcasena Urdiroz (University of Lleida, Spain); Cristina Vega (Universitat de Lleida, Spain)

**Wildland fuel type mapping in Attica using Sentinel-2 time-series**

Michail Sismanis, Alexandra Stefanidou, Dimitris Stavrakoudis and Ioannis Gitas (Aristotle University of Thessaloniki, Greece)

**Do fire danger classes in Croatia need calibration?**

Tomislava Hojsak, Tomislav Kozarić and Marija Mokorić (Meteorological and Hydrological Service, Croatia)

**Preliminary Coupled Fire-Atmosphere Model Simulations over Croatia**

Ivana Čavlina Tomašević (Croatian Meteorological and Hydrological Service, Croatia); Barbara Malečić (University of Zagreb, Croatia); Višnja Vucetić (Croatia); Maja Telišman Prtenjak (University of Zagreb, Croatia)

**Thursday, June 22 9:00 - 10:30**

**WSP: RES HEAT WORKSHOP**

Room: BRAČ 2

Chair: Pawel Oclon, Cracow University of Technology

**Energy simulation scenario to social housing building: combining heat pump and renewable energy system**  
Andrea Vallati, Francesco Muzi, Costanza Vittoria Fiorini and Miriam di Matteo (Sapienza University of Rome, Italy)

**Optimization of a thermal storage tank for a water source heat pump solar assisted**

Andrea Vallati, Gianluigi Lo Basso, Francesco Muzi, Costanza Vittoria Fiorini and Miriam di Matteo (Sapienza University of Rome, Italy); Pawel Oclon (Cracow University of Technology, Poland)

**The mathematical model for the design of the RESHeat system**

Piotr Cisek (Cracow University of Technology, Poland); Pawel Ocloń (Al Jana Pawła II 37, Cracow & Cracow University of Technolog, Poland); Marzena Nowak-Ocloń, Karol Kaczmarek and Monika Rerak (Cracow University of Technology, Poland);

**Simulation software for design improvement**

Filip Bartyzel (Cracow University of Technology, Poland); Pawel Ocloń (Al Jana Pawła II 37, Cracow & Cracow University of Technolog, Poland)

**Thursday, June 22 15:30 - 17:00**

**BD5: Advanced energy systems and technologies in buildings**

Room: BRAČ 1

Chair: Fabrizio Ascione, Università degli studi di Napoli Federico II

**Optimization of a Hybrid Renewable Energy System for power generation on Greek Non-Interconnected Islands: The case of Amorgos**

Georgios Chantzis and Anastasia Zafeiriou (Aristotle University of Thessaloniki, Greece); Amalia Chavari (Upstream S.A. Gerakas, Greece); Effrosyni Giama (Aristotle University of Thessaloniki, Greece); Paris Fokaides (Frederick University, Cyprus); Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece)

**Analytical examination of the performance of a novel heat recovery unit consisting of a thermal wheel and a building-integrated photovoltaic/thermal system with PCM**

Amin Shahsavari (Kermanshah University of Technology, Iran)

**Investigation of Electricity Consumption and CO2 Emissions from Cooling System Operation Strategies in Mosques** Ahmet Yuksel (Yalova University, Turkey); Muslum Arici (Kocaeli University, Turkey); Michal

Krajčák (Slovak University of Technology, Slovakia); Mihriban Civan and Hasan Karabay (Kocaeli University, Turkey)

**PCM-Based Glazing Systems: Solar-Optical Properties, Energy Savings, and Carbon Emission Abatement**

Saboor Shaik (Vellore Institute of Technology, India); Vishnu Priya, Maduru Venkata Ramana and SK Ariful Rahaman (Vellore Institute of Technology Vellore, India); Muslum Arici (Kocaeli University, Turkey); Karolos J. Kontoleon (Aristotle University of Thessaloniki, Greece); Dong Li (Northeast Petroleum University, China)

**Current trends of district heating and cooling in Europe - A review**

Vladimir Muncan (University of Novi Sad, Serbia); Igor Mujan (University of Novi Sad - Faculty of Technical Sciences, Serbia); Aleksandar Andjelkovic (University of Novi Sad, Serbia); Dusan J Macura (Public Utility Company Novi Sad Heating Plant, Serbia)

**Thursday, June 22 15:30 - 17:00**

**CS2: Citizen Science II**

Room: VIS

Chair: DIEGO LÓPEZ-DE-IPÍÑA, Deusto Institute of Technology - DeustoTech, University of Deusto and Diego Casado-Mansilla, University of Deusto

**Calibration strategies for low-cost compact field sensors in Citizen Science Air Quality measurements: Insights from SOCIO- BEE project**

Beatriz E Noriega Ortega (ECSA, Germany); Maria Kotzagianni (Municipality of Amaroussion, Greece); Amirhossein Hassani (The Climate and Environmental Research Institute NILU, Norway); Nicole Morresi (Università Politecnica delle Marche, Italy); Sergi Udina (Bettair Cities SL, Spain); Charalampos Kyfonidis (Centre for Research and Technology Hellas CERTH, Greece); Anargyros

**Framing Citizen Science for Climate Assemblies**

Aelita Skarzauskiene (Sauletekio Al. 11 Vilnius & Vilnius Gediminas Technical University, Lithuania); Monika Maciulienė (Vilnius Gediminas Technical University, Lithuania); Floridea di Ciommo and Gianni Rondinella (Cambiamo Sociedad Cooperativa Madrilena, Spain); Mohammad Azizur Rahman (Technovative Solutions, United Kingdom (Great Britain)); Yago Bermejo Abati (Deliberativa, Spain)

**Tackling co-delivery in co-production processes**

Daniel Silva (DeustoTech, University of Deusto, Spain); Ruben Sanchez-Corcuera (University of Deusto, Spain); Diego López-de- Ipiña (Deusto Institute of Technology - DeustoTech, University of Deusto, Spain); Elena Not (Fondazione Bruno Kessler, Italy); Diego Casado-Mansilla (University of Deusto, Spain); Chiara Leonardi (Fondazione Bruno Kessler, Spain); Roberto Carballedo (University of Deusto & Deusto Foundation - Deusto Institute of Technology, Spain); Matteo Gerosa (Fondazione Bruno Kessler, Italy); Felipe Vergara (University of Deusto, Spain)

**Thursday, June 22 15:30 - 17:00**

**WF2: Wildfires Track II**

Room: ŠOLTA

Chair: Marin Bugarić, University of Split and Ljiljana Šerić, University of Split

**Assessing human-caused wildfire ignition likelihood across Europe**

Adrián Jiménez Ruano and Marcos Rodrigues Mimbreno (University of Zaragoza, Spain); Fermín Alcasena Urdíroz (University of Lleida, Spain); Johan Sjöström (Research Institutes of Sweden, Sweden); Christopher Marrs (Technische Universität Dresden, Germany); Luís Mário Ribeiro (University of Coimbra - ADAI, Portugal); Palaiologos Palaiologou (Agricultural University of Athens, Greece); Emilio Chuvieco (University of Alcalá, Spain); Pere Joan Gelabert and Cristina Vega-García (University of Lleida, Spain)

**Community Involvement in Fire reporting: Time Series Examination of Official Reports and Social Media Posts in Split and Dalmatia County**

Selena Knežić Buhovac (University of Mostar & University of Split, Bosnia and Herzegovina); Ljiljana Šerić (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch., Croatia); Antonia Ivanda (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch. Croatia, Croatia)

**Visual-SEVEIF: a tool for economic planning on wildfire decision-making**

Macarena Ortega Pardo, Juan Ramon Molina and Antonio López Sancho (University of Cordoba, Spain) assessment support tool is useful in different decision-making approaches as prevention, suppression and post-fire, predominantly regarding fuel treatment prioritization, cost-efficient management, and budget allocation.

**Multichannel data from temporal and contextual information for early wildfire detection**

Damir Krstinic (University of Split, Croatia); Ljiljana Šerić (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch., Croatia); Antonia Ivanda (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch. Croatia, Croatia); Marin Bugarić (University of Split, Croatia)

**Thursday, June 22 15:30 - 17:00**

**FSSES: "Flexible and smart energy systems to decarbonise buildings"**

Room: BRAČ 2

Chair: Vlasta Zanki, Faculty of Geotechnical Engineering, University of Zagreb)

**WELCOME SPEECH AND INTRODUCTION:**

Sandro Nižetić (FESB)

**The occupant's awareness as a driving force for building decarbonisations**

Invited speech Vlasta Zanki (UNIZG-GFV)

**Fourteen months operation of a 200 kWh latent heat storage pilot**

Olav Galteland and Margaux Gouis (SINTEF & SINTEF Energy Research AS, Norway); Jorge Salgado-Beceiro (SINTEF & SINTEF Energy Research, Norway); Alexis Sevault (SINTEF & SINTEF Energy Research AS, Norway)

**Practical challenges towards data-driven applications in buildings: lessons-learned from two real-life case studies**

John Clauß, Luis Caetano and Kristian Stenerud Skeie (SINTEF Community, Norway); Åsmund Bror Svinndal (Kiona AS, Norway)

**Thermochemical Energy Storage: an approach to integration pathways**

Jorge Salgado-Beceiro (SINTEF & SINTEF Energy Research, Norway); Ragnhild Sæterli and Magnus Rotan (SINTEF Energy Research AS, Norway); Jan Hendrik Cloete (SINTEF, Norway); Margaux Gouis and Alexis Sevault (SINTEF & SINTEF Energy Research AS, Norway)

**The impact of smart buildings on circular economy**

Ivana Presečki (UNIZG-GFV), Aleksandra Anić Vučinić, Vlasta Zanki

**Panel debate with speakers:**

Alexis Sevault (SINTEF) - Conclusions of the workshop

**Friday, June 23**

**Friday, June 23 9:00 - 10:30**

**H1: Health I**

Room: HVAR

Chair: Ivana Šolić, University of Split

**Interdependency and cross-dependencies of COVID-19 time-series parameters using autocorrelation and cross-correlation**

Mohammed Anwer (Independent University, Bangladesh); Ferdous Jahan (Bangabandhu Sheikh Mujib Medical University, Bangladesh)

**A Novel Human Metabolism Measurement Approach and Wearable Sensor Realization for Thermal**

Comfort Evaluation Pei Zhang (The Hong Kong University of Science and Technology, Hong Kong); Huihe Qiu (The Hong Kong University of Science & Technology, Hong Kong)

**Heart Sound Classification using Deep Learning**

Marija Habijan (FERIT Osijek & FEA, Croatia); Irena Galić (Faculty of Electrical Engineering, Computer Science and Inf. Technology Osijek, Croatia); Aleksandra Pižurica (Ghent University, Belgium)

**IoT Ontology Development Process for Well-Being, Aging and Health: Challenges and Opportunities**

Hrvoje Belani (Ministry of Health of the Republic of Croatia), Petar Solic, Toni Perkovic (University of Split, FESB, Croatia) and Vladimir Plestina (University of Split, Faculty of science)

**Friday, June 23 9:00 - 10:30**

**P1: Professional papers session I**

Room: BRAČ 1

Chair: Mišo Jurčević, University of Split, FESB

**Remote expert system for diagnostics of propulsion engine**

Ozren Bukovac (University of Rijeka, Croatia); Vladimir Pelić and Tomislav Mrakovcic (University of Rijeka, Faculty of Engineering, Croatia); Maro Jelić (University of Dubrovnik, Croatia); Tino Vidović and Gojmir Radica (University of Split, FESB, Croatia); Nikola Račić and Branko Lalić (University of Split, Faculty of Maritime Studies, Croatia); Karlo Bratić (University of Split Maritime Studies, Croatia)

**Thermal Performance Comparison of Insulation and Phase Change Material for Building Wall Applications**

Ekrem Tunçbilek and Muslum Arici (Kocaeli University, Turkey); Michal Krajčik (Slovak University of Technology, Slovakia); Dong Li (Northeast Petroleum University, China); Sandro Nizetic (University of Split, FESB, Croatia); Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece)

**Optimization of auxiliary channel dimensions for improved water removal from PEM fuel cells**

Jure Penga (University of Split, FESB, Croatia); Željko Penga and Klara Bonković (University of Split, Croatia); Gojmir Radica (University of Split, FESB, Croatia); Lei Xing (University of Surrey, United Kingdom (Great Britain)); Qian Xu (Jiangsu University, China)

**Friday, June 23 9:00 - 10:30**

**PS: Professional short papers**

Room: ŠOLTA

Chair: Maja Škiljo, University of Split

***Estimation of the composite ply transverse elasticity modulus distribution using semi-empirical and numerical micromechanics***

Frane Vlak, Petra Bagavac, Stipe Perisic, Marko Vukasović and Branka Bužančić Primorac (University of Split, Croatia)

***The influence of the use of waste from olive oil production on the structural and technological properties of the produced bio-coke***

Michał Rejda (Institute of Energy and Fuel Processing Technology, Poland); Michał Książek (Sintef AS, Norway); Małgorzata Wojtaszek-Kalaitzidi (Institute of Energy and Fuel Processing Technology, Poland); Bartosz Mertas (Institute of Energy and Fuel Processing Technology, Poland); Sten Yngve Larsen (Eramet AS, Norway); Robert Baron (Koksownia Częstochowa Nowa sp. z o. o., Poland)

***Fourteen months operation of a 200 kWh latent heat storage pilot***

Olav Galteland and Margaux Gouis (SINTEF & SINTEF Energy Research AS, Norway); Jorge Salgado-Beceiro (SINTEF & SINTEF Energy Research, Norway); Alexis Sevault (SINTEF & SINTEF Energy Research AS, Norway)

***Thermochemical Energy Storage: an approach to integration pathways***

Jorge Salgado-Beceiro (SINTEF & SINTEF Energy Research, Norway); Ragnhild Sæterli and Magnus Rotan (SINTEF Energy Research AS, Norway); Jan Hendrik Cloete (SINTEF, Norway); Margaux Gouis and Alexis Sevault (SINTEF & SINTEF Energy Research AS, Norway)

***Energy consumption analysis according to green remodeling of public buildings***

Hansol Lee (University of Science and Technology, Korea (South)); Kyeong-seok Choi (Korea Institute of Civil Engineering and Building Technology(KICT), Korea (South))

**Friday, June 23 9:00 - 10:30 TPS**

**TPS IOT: Technical short papers IoT**

Room: KORČULA

Chair: Ljiljana Šerić, University of Split

***Rock masses crack monitoring using a LoRa-based Wireless Sensor Network***

Mattia Ragnoli (University of L'Aquila, Italy); Paolo Esposito (University of L'Aquila, Italy); Vincenzo Stornelli, Giuseppe Ferri and Alfiero Leoni (University of L'Aquila, Italy); Nicola Sciarra (University of Chieti-Pescara, Italy)

***Automatic Sensor Detection System for Automotive Industry Applications***

Massimo Scarsella and Mattia Ragnoli (University of L'Aquila, Italy); Beniamino Tambelli (TCM Group Srl, Italy); Germano Longo (RO. GER. PRO Srl, Italy); Giuseppe Ferri and Vincenzo Stornelli (University of L'Aquila, Italy)

***Agency and responsibility in smart air pollution monitoring***

Karin Ekman and Marisa Ponti (University of Gothenburg, Sweden); Marc Peñalver Grau (Norwegian Institute for Air Research, Sweden); Nuria Castell (NILU, Norway); Rasmus Nedergård Steffansen and Enza Lissandrello (Aalborg University, Sweden)

***A multi-standard Universal Datalogger for industrial applications***

Petar Solic (University of Split & FESB, Croatia); Mattia Ragnoli and Alfiero Leoni (University of L'Aquila, Italy); Toni Perkovic and Duje Čoko (University of Split, FESB, Croatia); Josip Sabic (University of Split, Croatia); Paolo Esposito (University of L'Aquila, Italy)

***Modeling and Implementation of an Adaptive Wireless Sensor Network for Low Power IoT Applications***

Kardelen Olcay, Baykal Sarioglu, Ertugrul Taparci, Melike Akmandor, Banu Kabakulak and Yigit Gokdel (Istanbul Bilgi University, Turkey)

***FARM: A Prototype DSS Tool for Agriculture***

Evangelia Vanezi, Maria Anastasiou, Christos Mettouris and Aliko Kallanou (University of Cyprus, Cyprus); Marijana Dimitrova (Inter-Edu, Macedonia, the former Yugoslav Republic of); George Angelos Papadopoulos (University of Cyprus, Cyprus)



**Friday, June 23 11:00 - 12:30**

**H2: Health I**

Room: HVAR

Chair: Katarina Vukojević, University of Split

***Initial User Evaluation for a Neck Gaiter for Tracing Swallowing Movements***

Tiina Vuohijoki, Tiina Ihalainen, Saara Törmä, Erja Sipilä, Karri Palovuori and Johanna Virkki (Tampere University, Finland)

***Fuzzy Inference System for Predicting Type of Delivery: A Valuable Smart Tool for Obstetrics and Gynecology***

Ayman Mansour (TTU, Jordan)

***Smartphone app based psychological interventions for patients with eating disorders***

Filip Mustac (University Hospital Centre Zagreb, Croatia); Tin Galijašević (School of Medicine University of Zagreb, Croatia); Martina Matovinović and Darko Marčinko (University Hospital Centre Zagreb, Croatia)

***Kidney Cancer and all its Imaging Presentations, Implementation of Artificial Intelligence***

Ivana Šolić, Marijan Šitum and Katarina Vukojevic (School of Medicine, University of Split)

**Friday, June 23 11:00 - 12:30**

**P2: Professional papers session II**

Room: BRAČ 1

Chair: Maja Škiljo, University of Split

***Modelling a Big Data-based Analytical Process: an Aerospace Case Study***

Angelo Corallo (Italy); Francesco Otello Buccoliero, Anna Maria Crespino, Vito Del Vecchio and Marianna Lezzi (University of Salento, Italy); Alessandra Spennato (Università del Salento, Italy)

***Development of ML algorithm to improve in situ measurement of the thermal properties of a building***

Serena Serroni (Università Politecnica delle Marche, Italy); Marco Arnesano (Università eCampus, Italy); Gian Marco Revel (Università Politecnica delle Marche, Italy); Morh Mamoun (Università Politecnica Delle Marche, Italy)

***A contribution toward the definition of criteria and indicators for climate change resilient buildings***

Laura Cirrincione, Giorgia Peri and Gianluca Scaccianoce (University of Palermo, Italy); Domenico Mazzeo (Politecnico di Milano, Italy); Nicoletta Matera (Independent Researcher, Italy)

***Detection of Tomato Leaf Disease in Farmland using Deep Learning***

Sarvesh Vishwakarma, Aanchal Sharma, Riya Dobhal, Naman Vijay and Prakriti Gupta (Graphic Era Deemed to Be University Dehradun, India)

**Friday, June 23 11:00 - 12:30**

**PV: Photovoltaics**

Room: ŠOLTA

Chair: Mirco Muttillio, Delft University of Technology and Patrizio Manganiello, TU Delft

***A tool providing I-V curve and IS analysis of a PV module embedded in a string***

Monica De Riso, Pierluigi Guerriero and Ilaria Matacena (University of Naples Federico II, Italy); Santolo Daliento (University of Napoli Federico II, Italy)

***Reconfigured PV array performance of BIPV system in urban area under Partial Shading Conditions***

Chuanyong Shao (Universite Paris-Saclay, France); Anne Migan-Dubois (University Paris Saclay, France); Demba Diallo (Université paris Sud, France)

***Bandwidth Characterization of c-Si Solar Cells as VLC Receiver under Colored LEDs***

Yilong Zhou, Aya Ibrahim and Mirco Muttillio (Delft University of Technology, The Netherlands); Patrizio Manganiello (TU Delft, The Netherlands); Hesam Ziar (Delft University of Technology, The Netherlands); Olindo Isabella (Delft University Of Technology, The Netherlands)

***Novel Asynchronous Algorithms for the Detection of Shading in Fully Reconfigurable Series-Parallel PV Modules***

Mirco Muttillio, Malte Ruben Vogt, Devyani Salokhe and Andres Calcabrini (Delft University of Technology, The Netherlands); Olindo Isabella (Delft University Of Technology, The Netherlands); Rudi Santbergen (Delft University of Technology, The Netherlands); Patrizio Manganiello (TU Delft, The Netherlands)

**Determining series resistance of the photovoltaic module**

Mario Ratković (FESB, Croatia); Tihomir Betti (University of Split, Croatia); Ivan Marasović (University, Croatia); Ivan Skalic (University of Split, FESB, Croatia)

**Friday, June 23 11:00 - 12:30**

**SDN: Smart Distributed Electrical Network**

Room: VIS

Chair: Nils Jakob Johannesen, University of Agder

**Maximum Power Point Tracking Algorithms**

Tea Erceg (University of Split & FESB, Croatia); Ivan Marasović (University, Croatia); Tihomir Betti (University of Split, Croatia); Ivan Skalic (University of Split, FESB, Croatia)

**Comparison of Genetic and Reinforcement Learning Algorithms for Energy Cogeneration Optimization**

Giorgia Ghione, Vincenzo Randazzo, Alessandra Recchia, Eros G Pasero and Marco Badami (Politecnico di Torino, Italy)

**Correlation Analysis of Potential Solar Photovoltaic Power Plant Integrated at Wind Farm considering Grid Connection Limits**  
Nils Jakob Johannesen (University of South-Eastern Norway), Mohan Lal Kolhe (University of Agder, Norway) and Andreas Dolven Jacobsen (University of South-Eastern Norway)

**Friday, June 23 11:00 - 12:30**

**TPS EM: Technical short papers engineering modelling**

Room: KORČULA

Chair: Visko Dorić, University of Split, FESB

**Numerical and experimental analysis of residual stresses in a metal-cored arc welded I-profile**

Mato Perić (University North Varaždin, Croatia); Ivica Garašić (Faculty of Mechanical Engineering and Naval Architecture, Croatia); Mislav Štefok (University of Zagreb, Croatia); Maja Jurica (Faculty of Mechanical Engineering and Naval Architecture, Croatia); Krešimir Osman (Zagreb University of Applied Sciences, Croatia); Ante Čikić and Zoran Busija (University North Varaždin, Croatia)

**X-FEM Calculation of Stress Intensity Factors in a Butt-Welded structure caused by Residual Stresses**

Mato Perić (University North Varaždin, Croatia); Ivica Galić and Krešimir Vucković (University of Zagreb, Croatia); Zdenko Tonković (Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia); Dragan Zeželj and Ivan Čular (University of Zagreb, Croatia)

**Analysis of geometrical parameters for modification of Goldak heat source model in MCAW using Ar-CO<sub>2</sub>-O<sub>2</sub> mixtures**

Mato Perić (University North Varaždin, Croatia); Ivica Garašić (Faculty of Mechanical Engineering and Naval Architecture, Croatia); Zdenko Tonković (Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia); Maja Jurica (Faculty of Mechanical Engineering and Naval Architecture, Croatia); Mislav Štefok (University of Zagreb, Croatia); Tomasz Kik (Silesian University of Technology & Faculty of Mechanical Engineering, Poland)

**Magnetotherapy Device Induced Fields in Simplified Human Body Model**

Mario Cvetković and Bruno Sucić (University of Split, Croatia)

**Development of Nanomaterials for Sustainable Food Packaging Applications**

Sanja Rackov, Milan Vraneš and Branka Pilić (University of Novi Sad, Serbia)

**Filter implementation as a means to enhance electromagnetic compatibility in chargers**

Domagoj Vestić (University of Split, FESB, Croatia); Ivan Marasović (University, Croatia); Tihomir Betti (University of Split, Croatia); Ivan Skalic (University of Split, FESB, Croatia)



# WORKSHOPS





## RESheat Workshop: Renewable Energy Sources

**Organizer:**

PAWEŁ OCŁOŃ, Cracow University of  
Technology, Poland

A dedicated session will showcase the latest developments and progress of the RESHeta project. Presentations by the consortium's scientific partners will focus on the issues of modelling RESHeat system operation and assessing its environmental impact. Industrial partners will present technical aspects of the project, including the technologies used and the concept of system integration.

June 22, 9:00–10:30, Brač 2



Project is funded within the Horizon 2020 program H2020-LC-SC3-2018-2019-2020: „Building a LowCarbon, Climate Resilient Future: Secure, Clean and Efficient Energy“. Total EU funding received is 2,4M EUR.

WELCOME SPEECH AND INTRODUCTION: PAWEŁ OCŁOŃ, Cracow University of Technology, Poland  
INVITED TALK BY Yee Van Fan. Brno University of Technology

# Meet the Editors

## Moderator:

**Sandro Nižetić** Editor in Chief of Editor of Energy Sources Part A: Recovery, Utilization and Environmental Effects (Taylor&Francis), Associate Editor of Journal of Cleaner Production (Elsevier), Associate Editor of Solar Energy Journal (Elsevier)

## Speakers:

**Henrik Lund**, Editor in Chief of Energy journal (Elsevier)

**Agis Papadopoulos**, Associate Editor in Energy and Buildings (Elsevier)

**Pawel Oclon**, Editor in Chief of Clean Engineering and Technology (Elsevier) and Archives of Thermodynamics Journal (Polish Academy of Sciences)

**Muslum Arici**, Associate Editor of Energy Sources Part A: Recovery, Utilization and Environmental Effects (Taylor&Francis), Subject Editor of Energy, Ecology and Environment (Springer)

**Sandro Nižetić** Editor in Chief of Editor of Energy Sources Part A: Recovery, Utilization and Environmental Effects (Taylor&Francis), Associate Editor of Journal of Cleaner Production (Elsevier), Associate Editor of Solar Energy Journal (Elsevier)



The topics to be discussed cover at least briefly: writing a potential successful scientific manuscript, selection of a right journal and their metrics, various types of paper submission, selecting and using the right references, similarity and plagiarism, correct novelty reasoning and presentation of the proposed methods and the results, proper conclusions writing, how to handle the reviewing process, final proofing, presentation and promotion of the published paper. Examples of successful publications will be given, with analysis of the features leading to their high impacts. The panels session is going to be followed by dedicated consultations of specific and individual features with close interaction with the audience.

June 21, 14:30–16:00, Brač 1

# Flexible and smart energy systems to decarbonise buildings

## Organizers:

University of Zagreb Faculty of Geotechnical Engineering, Department for Environmental Engineering, Croatia (UNIZG - GFV)

SINTEF Energy Research, Department of Thermal Energy, Norway



June 22, 15:30–17:00, Brač 2

Bilateral initiative is funded within the EEA and Norwegian Financial Mechanisms 2014-2021, Priority area Energy and climate change named: “Flexible and smart energy systems to decarbonise buildings” (2023-2024)

The decarbonisation of buildings is one of the biggest challenges in achieving the targets set by the Paris agreement and the EU Green Deal. Buildings are responsible for around 40% of energy consumption and 36% of CO<sub>2</sub> emissions in the EU, making them the single largest energy consumer in Europe. However, the final energy consumption in the building sector in Croatia in 2020 was responsible for 47.4% of the total final energy use, which pushes more responsibility and more challenges on initiatives to decarbonise the building sector. The service sector, where for example office buildings (university buildings) or hotels belong, is responsible for total 11% in Croatia. Countries can more easily achieve their ambitious energy and climate goals on national level by making buildings that belong to the service sector more energy efficient, equipping them with smart communication technologies for monitoring and optimizing energy consumption, renewable energy sources and innovative green energy storage technologies that are developed, tested and applied in different climates and types of buildings. However, although many energy efficient technologies are available on the market for many years, besides financial barriers, it is more evidenced that crucial trigger for the change is occupant’s awareness and behaviour change. Energy systems of the future in buildings rely very much on system smartness, e.g. implementation of digital technologies for metering, sensors and system flexibility, e.g. implementation of thermal and electricity storage. Decarbonisation of the heating system after decreasing heating and cooling demand with build-



ing insulation and passive systems is followed by a fuel switch from fossil fuels to biomass and electricity. Therefore, options for the introduction of smart technologies that will provide possibilities to monitor, manage and optimize building energy system are prerequisite for building retrofit but also basis to provide flexibility of the energy system introducing new technologies, such as innovative thermal energy storage with phase change materials (PCM) based on bio-wax or thermochemical energy storage. Future challenges due to an electrification of the heating system will be making use of the flexibility of energy systems that this workshop focuses on with regards to buildings. Additionally, considering that the focus for building decarbonisation is in implementation of energy efficiency measures and that only from the introduction of EU taxonomy in 2021 circularity aspects are requested on building materials, it is necessary to implement circularity principles in buildings technical systems especially the growing segment of equipment that enables better management of buildings and the application of the smart building concept.

### **Program:**

Sandro Nižetić, FESB: Welcome speech

Vlasta Zanki, UNIZG-GFV: The occupant's awareness as a driving force for building decarbonisations, Invited speech

Margaux Gouis, SINTEF: Fourteen months operation of a 200 kWh latent heat storage pilot Authors: Olav Galteland, Margaux Gouis, Jorge Salgado-Beceiro, Alexis Sevault

John Clauß, SINTEF: Practical challenges towards data-driven applications in buildings: lessons-learned from two real-life case studies Authors: John Clauß, Luis Caetano, Kristian Skeie

Jorge Salgado Beceiro, SINTEF: Thermochemical Energy Storage: an approach to integration pathways Authors: Jorge Salgado-Beceiro, Ragnhild Sæterli, Margaux Gouis, Magnus Rotan, Alexis Sevault

Ivana Presečki, UNIZG-GFV: The impact of smart buildings on circular economy Authors: Ivana Presečki, Aleksandra Anić Vučinić, Vlasta Zanki Panel debate with speakers

Alexis Sevault, SINTEF, Conclusions of the workshop

# SPECIAL SESSIONS



## The Wildfires track

### Organizers:

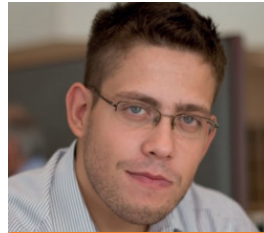
Ljiljana Šerić, University of Split, FESB, Croatia,  
Ioannis Gitas, Aristotle University of Thessaloniki, Greece,  
Marin Bugarić, University of Split, FESB, Croatia



Ljiljana Šerić



Ioannis Gitas



Marin Bugarić

The Wildfires track at SpliTech 2023 aims to bring together the wildfire research community and provide opportunities to present and discuss new innovations in conceptual, technical and computational methods and solutions in wildfire management. In the area of wildfire management, advancement of novel sensing technologies (remote sensing included) joined with data from citizen volunteers and publicly available data, provides a fertile ground for innovation and excellence. Recent advances in robotics have allowed cutting-edge innovations to be made in the surveillance and suppression of wildfires. New forecasting models and techniques for natural and climate changes, in addition to providing insight into future regimes, help guide methods for mitigating their effects. Accepted and presented papers will be published in the conference proceedings and submitted to IEEE Xplore, as well as other Abstracting and Indexing (A&I) databases.

# Smart Distributed Electrical Network: Opportunities and Challenges for Integration of Renewable Energy Systems

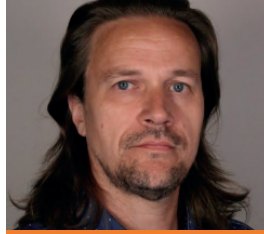
## **Organizers:**

Mohan Lal Kolhe, University of Agder, Norway,

Nils Jakob Johannesen, University of SouthEastern Norway, Norway



Mohan Lal Kolhe



Nils Jakob Johannesen

A future 'Smart Distributed Electrical Energy Network' will serve as a dynamic network for multi-directional energy flows, linking widely distributed small capacity intermittent renewable energy systems at consumer level (distribution network) and centralized higher-capacity power generators, facilitating active participation of customer choice for demand side management, energy production / storage, and providing real-time information on the performance and optimal operation of the smart electrical energy network.

# Enabling Citizen Science with emerging technologies to foster pro-environmental behaviour

## Organizers:

Diego Casado Mansilla University of Deusto, Spain,  
Diego López de Ipiña University of Deusto, Spain



Diego Casado  
Mansilla



Diego López de Ipiña

Human intelligence, IoT, and AI each have their own strengths and weaknesses. Machines are effective and efficient in the discovery of implicit knowledge or hidden patterns from large-scale data. In contrast, humans are good at conducting cognitive analysis such as reasoning, inference, and making instinctive judgments by taking into consideration dynamic and multiple factors. When people are organized into groups to conduct research activities, this is called Citizen Science, which pursues Collective Intelligence. Citizen science needs more and more technological artifacts to be effective for scientific endeavours. Therefore, humans and machines do not have to be competitive or mutually exclusive, and one does not have to dominate/replace the other. One way to address the two issues mentioned above is to marry the strengths and mitigate the weaknesses of human intelligence and emerging technologies, making them work in collaboration and cooperation. This is very much the rationale behind the concept of the Internet of People. In this Special Session, we will gather evidence from existing research regarding the intersection of Citizen Science, Artificial Intelligence, data from space (e.g., Copernicus), and IoT (e.g., low-cost sensors) to create communal smart environments where synergy and symbiosis among the agents are enabled. We are especially interested in experiences where people collaborate with other people and machines in activities such as data collection (e.g., participatory/opportunistic sensing), modeling, hypothesis testing, analysis, and outreach for a wide range of applications of crowd-sourced, Internet-based information with the focus on pro-environmentalism and pursuing activism towards preserving the planet or co-ideate adaptation strategies to new environmental events related to climate change (e.g., improve the air that we all breathe). Accepted, and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. Authors of selected best papers will be invited to submit an extended version of their manuscripts for publication in a special issue of some international and indexed journals.

# International Symposium on Statistics and Machine Learning in Electronics

## **Symposia general chairs:**

Marin B. Marinov Technical University of Sofia, Bulgaria,  
Stefan Hensel University of Applied Sciences Offenburg,  
Offenburg, Germany,  
Malinka Ivanova Technical University of Sofia, Bulgaria



Marin B. Marinov



Stefan Hensel



Malinka Ivanova

The International Symposium on Statistics and Machine Learning in Electronics, in the framework of the 8th International Conference on Smart and Sustainable Technologies (SpliTech2023) will be held in Bol and Split, Croatia, on June 20-23, 2023. The aim of the International Symposium on Statistics and Machine Learning in Electronics is to bring together young and experienced researchers, students and educators with interests in how statistics, machine learning and fuzzy logic could facilitate analysis, design, testing, diagnosis, measurement and manufacturing of electronic circuits, modules and devices. Final scientific results and research in progress will be presented and discussed, revealing new models, methods, algorithms, techniques, and methodologies. The conference is base for forming an international scientific network, spreading new and innovative ideas and the best practices. It will distribute the achieved findings during the project “Exploration Applications of Statistics and Machine Learning in Electronics”, financed by National Scientific Fund.

# SYMPOSIUM on INTERNET of THINGS

## **Symposia organizer:**

Luigi Patrono University of Salento, Italy



The International Symposium on Internet of Things aims to present and discuss recent advances in the area of the Internet of Things, Embedded systems, Artificial Intelligence, Cybersecurity, Block Chain, Intelligent Systems and Smart Environments that are becoming research topics more and more interesting for both academia and industry. This symposium will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area. The Symposium on Internet of Things includes also six different Special Sessions:

### **Special Session on Artificial Intelligence and Deep Learning applied to Smart Environments**

Organizers: Cosimo Distante CNR, Italy,  
Abdelmalik Taleb-Ahmed University Polytechniques Hauts de France,  
Valenciennes, France, Abdenour Hadid Sorbonne, Abou Dabi, UAE

Today interconnected objects are everywhere, they are a formidable source of data and their processing allow to boost smart and interacting environment capabilities. To this aim, Artificial Intelligence (AI) and Machine Learning (ML) play an important role in accomplishing this achievement. In the latest decade AI and ML have received great attention to solve difficult and complex problems in smart and interactive environments, and their advances brought impressive progresses in several fields such as medicine, ehealth, healthcare, neuroscience, brain-computer interface, neuro-feedback, robotics and automotive, biometrics, etc. In this context, the ad-



vanced learning techniques such as deep learning, reinforcement learning, deep reinforcement learning, statistical learning have shown their effectiveness to solve various problems of detection, classification, clustering, segmentation, control, diagnosis, etc.; and thus, becomes useful solutions to be investigated more for other open problems. Special session within the International Symposium on the Internet of Things Abdelmalik Taleb-Ahmed University Polytechniques Hauts de France, Valenciennes, France Abdenour Hadid Sorbonne, Abou Dabi, UAE Artificial Intelligence and Deep Learning Applied to Smart Environments This Special Session will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area.

### **Special Session on Big Data and IoT**

Organizers: Aitor Almeida (Deusto University, Spain)

With the increase of the adoption of IoT devices in multiple domains, the data processing and analysis requirements have grown similarly. IoT devices can be found in multiple environments (homes, industrial installations, office spaces...), with heterogeneous sensors providing multimodal continuous data streams. New approaches in Big Data, Data Analytics, Open Data, Behavior Analysis, Semantic Location Services and Artificial Intelligence are needed to properly process and manage those data streams. The Special Session on Big Data and IoT is included in the International Symposium on the Internet of Things organized in the frame of the 8th International Conference on Smart and Sustainable Technologies (SpliTech 2023), technically co-sponsored by the IEEE Communication Society (Com-Soc), will be held in Bol and Split, Croatia, June 20-23, 2023. Big Data and IoT Special session within the International Symposium on the Internet of Things Aitor Almeida (Deusto University, Spain) The main goal of the Special Session is to present and discuss recent advances in the area of data analysis, management and processing in IoT. This Special Session will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area. Accepted, and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. Authors of selected best papers will be invited to submit an extended version of their manuscripts for publication in a special issue of some international and indexed journals.

### **Special Session on Extended Reality Applications for Smart Environments**

Organizers: Unai Aguilera University of Deusto, Spain

The latest trends in Extended Reality (XR) technologies (i.e. Virtual, Augmented and Mixed Reality) provide new possibilities for user interaction and data visualization within smart environments. These technologies allow to bridge the gap between the real and virtual world, allowing to create innovative applications in multiple domains (industry, health, education, smart cities, ...). Despite the advances made in recent years, several challenges remain to be addressed on the application of XR technologies on smart environments. The Special Session on “Extended Reality Applications for Smart Environments” is included in the International Symposium on the Internet of Things organized in the frame of the 8th International Conference on Smart and Sustainable Technologies (SpliTech 2023), technically co-sponsored by the IEEE Communication Society (ComSoc), will be held in Bol and Split, Croatia, June 20-23, 2023. The main goal of the Special Session is to present and discuss recent advances in the application of XR technologies for smart environments. This Special Session will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area. Accepted, and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. Authors of selected best papers will be invited to submit an extended version of their manuscripts for publication in a special issue of some international and indexed journals.

### **Special Session on Prototyping techniques and sensing solutions for IoT-aware embedded systems**

Organizers: Massimo De Vittorio Italian Institute of TechnologyIIT, Italy,  
Paolo Visconti University of Salento, Italy

The Special Session on “Prototyping techniques and sensing solutions for IoT-aware embedded systems” is included in the International Symposium on the Internet of Things organized in the frame of the 8th International Conference on Smart and Sustainable Technologies (SpliTech 2023), technically co-sponsored by the IEEE Communication Society (ComSoc), will be held in Bol and Split, Croatia, June 20-23, 2023. The main goal of the Special Session is to present and discuss recent advances in the area

of IoT-based sensing and data processing systems, both prototypes and customized solutions, applied in different scenarios. This Special Session will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area. Accepted, and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases.

### **Special Session on Cybersecurity and IoT**

Organizers: Luca Mannella Politecnico di Torino, Italy

The Special Session on “Cybersecurity and IoT” is included in the International Symposium on the Internet of Things organized in the frame of the 8th International Conference on Smart and Sustainable Technologies (SpliTech 2023), technically co-sponsored by the IEEE Communication Society (ComSoc), will be held in Bol and Split, Croatia, June 20-23, 2023. The main goal of the Special Session is to present and discuss recent advances in the area of the cybersecurity correlated to the IoT context. This Special Session will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area. Accepted, and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. Authors of selected best papers will be invited to submit an extended version of their manuscripts for publication in a special issue of some international and indexed journals.

### **Special Session on Innovative Solutions and Research projects on One-Health and Safety ecosystems**

Organizers: Alessia Bramanti University of Salerno, Italy,  
Ilaria Sergi University of Salento, Italy,  
Teodoro Montanaro University of Salento, Italy

In recent years, the interest of the research community in integrating digital technologies into various domains is growing. In addition, the Internet of Things (IoT) technologies are becoming day by day more prevalent in the domains that regards the users’ wellbeing and the application of the

so-called “One health” approach that foreseen a collaborative, multisectoral, and transdisciplinary work to achieve optimal health outcomes. Different solutions have been proposed and adopted in both research and industrial domains to guarantee and support user wellbeing and specifically enhance users’ health conditions and safety. Furthermore, the global initiatives towards the sustainable economy and the needs emerged during the Covid-19 pandemic have additionally played a crucial role in accelerating this process by promoting, for instance, the home-based healthcare or the remote support of workers. To this aim, new opportunities have arisen, and different researchers are experimenting innovative solutions, such as monitoring healthy people to prevent future illness, reducing hospitalizations in cases of less risky diseases, or remotely monitoring workers through wearable adhoc devices. The Special Session on “Innovative Solutions and Research Projects focused on Well-being, One-Health and Safety Ecosystems” is included in the International Symposium on the Internet of Things organized in the frame of the 8th International Conference on Smart and Sustainable Technologies (SpliTech 2023), technically co-sponsored by the IEEE Communication Society (ComSoc), will be held in Bol and Split, Croatia, June 20-23, 2023. During this special session, we will shed some light on cutting-edge and interdisciplinary applicative research, as well as commercial solutions in the field of user well-being specifically focused on the so called “one Health” approach. Accepted, and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. Authors of selected best papers will be invited to submit an extended version of their manuscripts for publication in a special issue of some international and indexed journals.

# SYMPOSIUM on Mitigation and Adaptation Strategies towards Decarbonization of Built Environment

**General chair:**

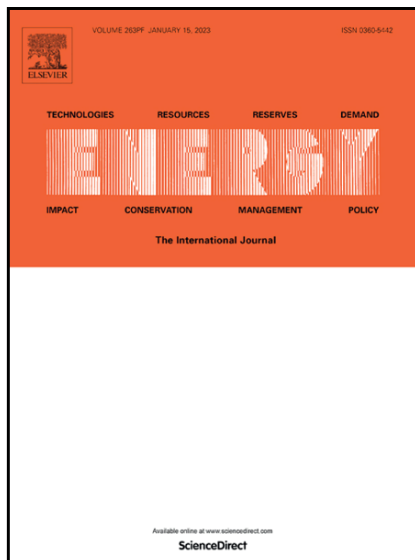
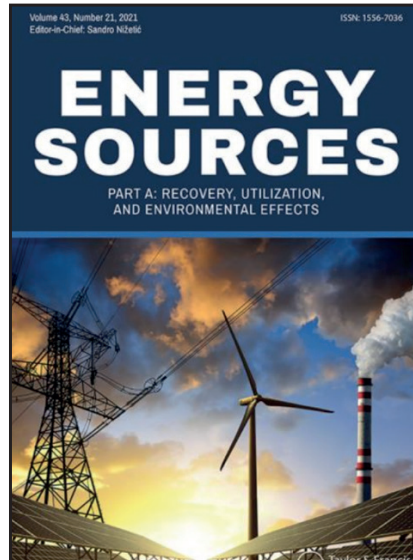
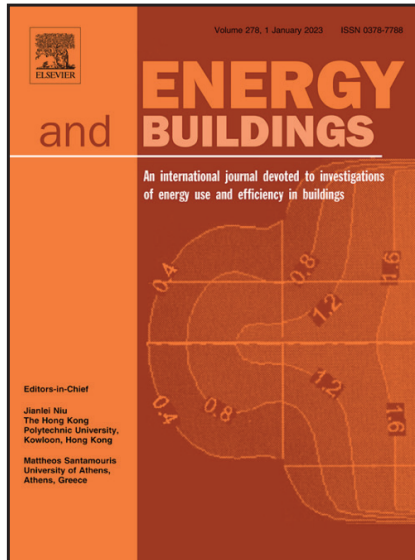
Mattheos Santamouris, University of New South Wales, Australia



**Co-chairs:** Agis Papadopoulos, Aristotle University of Thessaloniki, Greece  
Fabrizio Ascione, University of Napoli, Italy  
Marcos Eduardo Gonzalez Trevizo, Autonomous University of Baja California, Mexico  
Sandro Nižetić, University of Split, Croatia,  
Muslum Arici, Kocaeli University, Turkey

We are proud to announce that organizer of the Symposium on “Mitigation and Adaptation Strategies towards Decarbonization of Built Environment” is distinguished professor Mattheos Santamouris from University of New South Wales in Australia. Professor Santamouris is one of the leading researchers in the field of urban overheating and energy use in buildings and one of the top cited researchers. Technological advancements allowed various engineering possibilities to decarbonize built environment. The climate change is affecting and shaping urban and dense populated areas, especially cities. The adaptation is necessary in order to be able to secure sufficient life quality in populated urban areas. The mitigation is reflected through necessary actions both on the building as well as urban scale, i.e., by development of the advanced energy systems with secured high share of renewables, involvement of novel building materials, improvement in energy efficiency, implementation of smart technologies, etc. Integration and collaboration between different engineering disciplines is key one in order to develop efficient and suitable strategies to combat climate change and to secure desirable life quality in built environments. Practical and useful innovations in various engineering disciplines would be discussed and

presented within mini symposium and where presented knowledge would be useful for academia members, industry professionals and policy makers. After the conference the selected high-quality works would be invited for possible publication in partner journals.



# SYMPOSIUM on Photovoltatronics

## Organizers:

Patrizio Manganiello, Delft University of Technology, The Netherlands,  
Mirco Muttillio, Delft University of Technology, The Netherlands



Patrizio Manganiello



Mirco Muttillio

As one of the major drivers of the energy transition, Photovoltaic (PV) technology will play an essential role in local generation of clean electricity in expanding urban areas. To take full advantage of PV in the urban environment, PV technology must become intelligent. Photovoltatronics is an emerging research field that deals with intelligent PV and its application in components with multiple functionalities. Through a combination of PV, signal and power electronics, storage, and digital technologies, Photovoltatronics is leading towards a change of paradigm: from conventional PV modules to PV-based intelligent energy agents. As such, Photovoltatronics will deliver solutions for electricity generation and information communication in applications such as building environment, e-mobility, sensing, and domotics. This symposium will provide an opportunity for scientists, engineers, and young and experienced researchers to discuss recent advances – both methodological, hardware and software – in the broad and multidisciplinary field of Photovoltatronics, with Special Sessions focusing on the different areas and contexts.

# SYMPOSIUM on Advances in RFID Technology and Electromagnetics for IoT

## **Organizer:**

Luca Catarinucci, University of Salento, Italy



The “International Symposium on Advances in RFID Technology and Electromagnetics for IoT”, in the framework of the 8th International Conference on Smart and Sustainable Technologies (SpliTech2023), technically co-sponsored by the IEEE Council of RFID (CRFID) and by the IEEE Communication Society (ComSoc), will be held once again in Bol and Split, Croatia, on June 20-23, 2023. As in 2022 Edition, the Symposium opens the doors to all those electronic/ electromagnetic technologies that, like RFID, enable the Internet of Things. The main goal of this Symposium is to present and discuss recent advances in all the Electromagnetic Technologies, with special emphasis on RFID, that mostly enable IoT-aware applications, and that are more and more appealing for both industry and academic researchers. The symposium will provide an opportunity for scientists, engineers, and researchers to discuss recent advances in this fascinating technological area, with dedicated focused Special Sessions that will deepen the research challenges in specific contexts. Accepted and presented papers will be published in the conference proceedings and submitted to IEEE Xplore as well as other Abstracting and Indexing (A&I) databases. Authors of selected papers will be invited to submit an extended version of their manuscripts for publication in a special issue of the IEEE Journal of RFID, indexed both in SCOPUS and WoS.

## **Special Session on Wearable, conformal and flexible antennas for RFID**

Organizers: G. Andrea Casula, University of Cagliari, Italy,  
Hendrik Rogier, Ghent University, Belgium

Nowadays, we are experimenting a significant and continuous change in everyday life since the beginning of wireless networking technology. The



Internet of Things (IoT) is for sure one of the fastest and most interesting evolving technologies of the near future. In this framework, multiple devices can interact in the physical world through the IoT, and IoT technologies will enable every object to become smart and interconnected, providing an emerging integrated wireless platform where physical and virtual things can be uniquely identified on a global scale and are wirelessly connected to a global network. Particularly modern applications and systems require rapid implementation of wireless communication everywhere and every-time. Authors are invited to submit recent advances on devices for wearable, conformal and/or flexible devices for RFID/IoT applications, such as new configurations of antennas with linear, dual or circular polarization particularly suitable for RFID and/or IoT systems (platform tolerant, 3D printed, wearable, textile, conformal, epidermal, or implantable devices, and so on).

### **Special Session on Future trends of RFID technology for Society and Industry**

Organizers: Alice Buffi, University of Pisa, Italy,  
Antonis Dimitriou, Aristotle University of Thessaloniki, Greece

Increasingly industrial, civil and social applications benefit from the Internet of Things (IoT) paradigm. Smart Industry, Smart Healthcare, Smart Mobility, Smart City, to name few, can be developed thanks to cutting-edge technologies. Surely, Radio Frequency Identification (RFID) systems have a key role not only for identification, but also for a manifold of further features. This special session aims at collecting smart systems, research projects and use-cases, which use RFID and other IoT technologies, to obtain high-level, reliable and innovative solutions in several application fields. Particular attention will be put on advantages and peculiarities to assess the current trends in using them and explore novel scenarios.

### **Special Session on Artificial intelligence (AI)-enhanced edge sensing and decision-making for electromagnetic devices**

Organizers: Massimo Merenda, University Mediterranea of Reggio Calabria, Italy,  
Arcangelo Bruna, STMicroelectronics, Catania, Italy

This special session at IEEE Splitech 2023 will focus on the use of artificial intelligence (AI) techniques to enhance edge sensing and decision-making in electromagnetic devices. The session aims to bring together researchers and practitioners working in this field to present their latest findings, discuss challenges and opportunities, and foster collaborations.

### **Special Session on Electronic and Radiation Systems for Internet of Medical Things**

Organizers: Luciano Mescia, Polytechnic of Bari, Italy,  
Giuseppe Coviello, Polytechnic of Bari, Italy,  
Antonello Florio, Polytechnic of Bari, Italy

Smart electronic systems equipped with lots of sensors and devices are gaining an increasingly important role in everyday life and in the so-called Internet of Medical Things. Thanks to those devices it is possible to monitor biological parameters, for example aiding doctors' job by supporting the final diagnosis and monitoring the progress induced by the assigned therapy, monitoring the body response during sports sessions or simply monitoring the biological signals during the day.

As a result of a great research effort, the miniaturization of the circuits and components brought attention to designing compact but very complex and power-efficient devices users can bring along without interference with everyday life. Moreover, new flexible materials allowed to make those devices more interesting and less invasive since the boards and the antennas can be put on following the body shapes. This Special Session aims to highlight research challenges and technological advancements in design, modelling, and characterization of electronic and antenna systems suitable for the Internet of Medical Things.

### **Special Session on RFID and IoT electronic and electromagnetic augmented devices and systems for sustainability, wellness, industry, and safety**

Organizers: Andrea Motroni, University of Pisa, Italy,  
Andrea Ria, University of Pisa, Italy,  
Ferran Paredes, Universitat Autònoma de Barcelona, Catalunya, Spain

Internet of Things and/or RFID technology among all stand out as futuristic solutions for the implementation of environmental sensor systems in numerous application fields. The benefits of unwired sensing are plentiful and find location in several scenarios such as sustainability, wellness, industry, and safety. This session aims at sharing the latest cutting-edge activities in the development of IoT and RFID electronic and electromagnetic sensors, devices and systems.

### **IEEE-CRFID Workshop on Flexible and Printable Technologies in Electronics and Electromagnetics (WFPE)**

Organizers: Almudena Rivadeneyra, University of Granada, Spain;  
Manuela Ciocca, Free University of Bozen-Bolzano, Italy;  
Niels Benson, University of Duisburg-Essen, Germany;  
William Whittow, Loughborough University, UK;  
Riccardo Colella, University of Salento, Italy;  
Francesco Paolo Chietera, University of Salento, Italy;  
Luca Catarinucci, University of Salento, Italy

Manufacturing Flexible and printable devices is a rapidly growing field of interest for electronics and electromagnetics, with potential applications in various areas such as healthcare, robotics, and IoT. Key materials used include conductive polymers, deposited using printing techniques such as inkjet, screen, fused filament fabrication, or realized through vat-polymerization. Flexible and printable electromagnetic devices, such as antennas and RFID tags, are also being developed more and more often using these types of technologies, while the integration of flexible and printable electronics into products and systems, such as textiles and packaging, is also an area of progress. However, challenges still exist, including device performance, reliability, and cost.

The workshop aims to bring experts together to discuss the latest developments, challenges, and opportunities of this exciting research branch and will provide a platform for attendees to present their research, share their knowledge and experiences, and network with their peers.

### **Special Session on Zero-power and low environmental footprint wireless sensor : Toward green IoT devices**

Organizers: Arnaud Vena, Université de Montpellier, France

This session is dedicated to the latest research on battery-free and ultralow power wireless sensors. Contributions involving passive RFID technology and backscatter based communication nodes are particularly welcome in this session. This session is also open to studies on new materials and manufacturing processes to build environmentally friendly wireless sensors with the potential to be biodegradable when discarded in the environment.

### **Special Session on Exploring Advances in RFID & Electromagnetics for IoT in Asia**

Organizers: Malay Ranjan Tripathy, Amity University, Noida, India;  
Ravi Arya, Zhongshan Institute of Changchun University of Science and Technology, China

The ever-growing Internet of Things (IoT) is driving a demand for Radio Frequency Identification (RFID) and Electromagnetic (EM) technologies that can support it. Asia is involved in these developments, and the purpose of this special session is to explore the latest advances in RFID and EM in this region. The session welcomes contributions from Asian researchers, practitioners, and industry experts who are working on a range of topics including but not limited to, on-metal antennas, reader design, backscattering, prototyping, flexible devices, and industrial projects. The session provides an opportunity for scientists and engineers to present their cutting-edge research, share their experiences, and network with peers. We encourage submissions of original research papers, case studies, and review papers that advance the state-of-the-art in the field of RFID and EM for IoT in Asia.

# TUTORIALS

# Human Exposure to Electromagnetic Fields

## Organizers:

Dragan Poljak University of Split, Croatia;

Mario Cvetković, University of Split, Croatia



Dragan Poljak



Mario Cvetković,

June 23 09:00–10:30; VIS

This Tutorial is primarily based on the book, D. Poljak, M.Cvetkovic, Human Interaction with Electromagnetic Fields; Computational Models in Dosimetry, Elsevier 2019, on some recent journal/conference papers and recent activities of both presenters in IEEE ICES SC6 Working Groups. Tutorial will cover several aspects of human exposure to electromagnetic fields (EMF) including not only the undesired exposure from artificial sources, but also the biomedical applications of electromagnetic fields. The tutorial deals with some basic environmental aspects of electromagnetic fields, coupling mechanisms between human body and electromagnetic field, well-established biological effects of electromagnetic fields from static to high-frequency range, international safety guidelines related to limiting exposures to those fields, including relevant exposure limits and safety guidelines, electromagnetic-thermal dosimetry models and the related analytical/numerical solution methods. Finally, some recent findings pertaining to activities undertaken within the framework of IEEE ICES working groups, which Tutorial presenters participated (WG2, WG3, WG5 and WG7) will be reported.

First, theoretical/experimental methods of incident field dosimetry for the assessment of external fields due to low frequency (LF) and high frequency (HF) sources are addressed in detail. Illustrative examples cover analysis of power lines, transformer substations, PLC systems, RFID antennas, Wireless Power Transfer (WPT) systems and radio base stations pertaining to 2G/3G/4G and 5G mobile communication systems. Then, the tutorial outlines some electromagnetic-thermal dosimetry methods for the assessment of human exposure to low frequency (LF), high frequency (HF) and transient electromagnetic radiation featuring the use of integral/differential equation formulations and related numerical solution procedures (primarily based on the use of Boundary Element Method – BEM, Finite Element method – FEM and hybrid BEM/FEM approaches) for the evaluation of induced current densities, internal fields,

specific absorption rate (SAR), incident power density (IPD), absorbed power density (APD), transmitted power density (TPD) and specific absorption (SA). Also, for HF exposures the related temperature increase in tissues is of interest. In particular, for GHz frequency range, as far as 5G systems are of interest, a surface temperature increase on the air-body interface is studied. Illustrative computational examples pertain to various realistic exposure scenarios, such as; pregnant woman/foetus exposed to low frequency (LF) fields, the human eye, the human brain and the human head exposed to HF radiation. In particular, for exposure within GHz frequency range, several tissue models, from rather simple to more realistic, will be addressed. The obtained numerical results for induced current densities, internal fields, SAR, IPD, APD TPD and SA are compared against exposure limits proposed by recently issued ICNIRP 2020 (International Commission on Non Ionizing Radiation Protection). This is followed by some examples of biomedical applications of electromagnetic fields, including the transcranial magnetic stimulation (TMS), transcranial electrical stimulation (TES), but also some electrotherapy and magnetotherapy techniques. Also, some illustrative computational examples pertaining to thermal modeling of certain ophthalmological procedures will be given. In the last part of the Tutorial the stochastic modeling of electromagnetic fields is discussed. Namely, the input parameters of models used in bioelectromagnetics and electromagnetic dosimetry suffer from uncertainties in input data set. The values of body tissue parameters such as permittivity and the electrical conductivity vary significantly, depending on the age and gender, but also between healthy and ill individuals. Moreover, they are obtained under different measurements on ex vivo animal and human tissues, and exhibit relatively appreciable variations from their average values. When used in a computational model, these average values sometimes may lead to a rough approximation of the realistic scenario. The models used in bioelectromagnetics are computationally rather demanding as they represent tremendously complex physical phenomena. Consequently, uncertainty quantification (UQ) based on traditional Monte Carlo method appears to be computationally rather expensive. Therefore, alternative methods such as generalized polynomial chaos and stochastic collocation have become of interest to many researchers in this research area. In this tutorial, an outline of the application of stochastic collocation (SC) together with some illustrative examples are given. Finally, a sensitivity analysis on the impact of individual input parameters will be discussed.

## About the organizers:

**Dragan Poljak** received his PhD in el. Eng. in 1996 from the Univ. of Split, Croatia. He is the Full Prof. at Dept. of Electron. and Computing, Univ. of Split. His research interests include computational electromagnetics (electromagnetic compatibility, bioelectromagnetics, ground penetrating radar and plasma physics). To date Prof. Poljak has published more than 160 journ. and 250 conf. papers, and authored some books, e.g. two by Wiley, New Jersey and one by Elsevier, St Louis. He is a Senior member of IEEE, a member of Editorial Board of Eng. Anal. with Boundary Elements, Math. Problems in Eng. And IET Sci. Measur. & Techn. He was awarded by several prizes for his research achievements, such as National Prize for Science (2004), Croatian sect. of IEEE annual Award (2016), Technical Achievement Award of the IEEE EMC Society (2019) and George Green Medal from University of Mississippi (2021). From May 2013 to June 2021 Prof. Poljak was a member of the board of the Croatian Science Foundation. He was involved in ITER physics EUROfusion collaboration and he is currently involved in DONES EUROfusion collaboration and in Croatian center for excellence in research for tech. sciences. He is active in few Working Groups of IEEE/Internat. Committee on Electromagnetic Safety (ICES) Tech. Comm. 95 SC6 EMF Dosimetry Modeling, (co-chair of WG2 and WG7).

**Mario Cvetković** received his BSc in electrical engineering from the University of Split, Croatia in 2005. In 2009 he obtained MPhil degree from the Wessex Institute of Technology, University of Wales, UK. In December 2013 he received PhD from University of Split, Croatia. He is assistant professor at the Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), University of Split where he teaches fundamentals of electrical engineering course. He held a series of tutorials and seminars related to advanced topics in bioelectromagnetics and various aspects of interaction of humans with electromagnetic fields at the: Technical University of Ilmenau, Germany (2010), Malardalen University, Vasteras, Sweden (2014, 2018), Nagoya Institute of Technology, Nagoya, Japan (2017), University of Maribor, Slovenia (2018, 2019), several Splitech conferences (2016, 2017, 2018, 2019), and SoftCOM conferences (2019, 2021). He is a recipient of the "Best Student Paper Award", awarded at the 16th edition of the international conference SoftCOM 2008. At the Scientific Novices Seminar held in 2012, he was awarded with the recognition for his previous scientific achievements. To date he has published more than 70 journal and conference papers and several book chapters. In 2019 he coauthored with D. Poljak the book entitled "Human Interaction with Electromagnetic Fields - Computational Models in Dosimetry" published by Elsevier. He is a member of the IEEE/International Committee on Electromagnetic Safety (ICES) Technical Committee 95 SC6 EMF Dosimetry Modeling.





## FACILITIES

Accommodation 300 rooms and 6 suites

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Sport

Fitness, indoor golf simulator, disco, bowling, pool, table tennis, tennis center (26 clay courts), diving, surfing and sailing course...

Swimming pools

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Thalasso wellness

Area of 3500 m<sup>2</sup> (12 treatment rooms), saunas, aqua world and relax area, wide selection of classic and exotic treatments based on sea water

Entertainment

Night club "Elaphusa", cocktail bar "Bole-ro", disco bowling...

Parking

## HOTEL ELAPHUSA, BOL

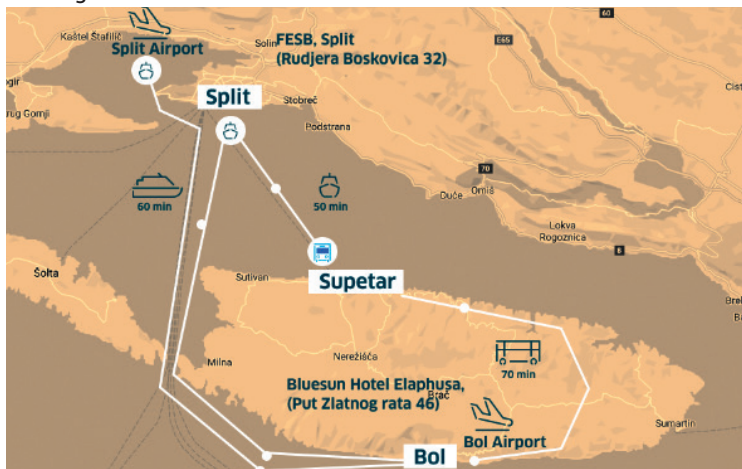
Conference center of Bluesun hotel Elaphusa is ideal for hosting all types of conference events and cultural manifestations. There are total of 5 conference halls. The largest hall has the capacity of 800 seats, while the other 4 can accommodate 10 to 120 persons.

## TRAVELLING TO BOL

Bol can be reached:

- 1) Fast boat directly to Bol
- 2) Ferry from Split to Supetar and then take the bus from Supetar to Bol

\*Nearest Airports: Split Airport, Brač Airport



## ABOUT SPLITECH 2023 CONFERENCE

### PROCEEDINGS

All participants will receive the Final program and USB Proceedings when registering at the Conference desk

### LANGUAGE

The Conference language is English

### REGISTRATION

June 20 08:00–13:00

June 21 08:00–17:30

June 22 08:00–17:30

June 23 08:00–11:00

### SECRETARY

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## FACULTY OF ELECTRICAL ENGINEERING, MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE (FESB), SPLIT



SpliTech 2023 will be organized by the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB), University of Split.

The basic activities of the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture involve teaching, research, development, professional work and innovation in the areas of technical sciences, including Electrical Engineering, Electronics, Mechanical Engineering, Naval Architecture, Computer Science, Industrial Engineering and Natural Sciences. With approximately

2500 students and more than 230 employees, FESB has grown into a recognized and highly respectable educational and research institution dealing with advanced technologies and consequently contributing to the development of the economy and society. In particular, the robustness of FESB research capabilities has been confirmed through numerous successful competitive and other research and technological projects, number of scientific and professional papers published in peer-review journals, approximately and through the continuous cooperation with internationally recognized research and academic institutions, respectively. One of the biggest and best equipped faculties on the campus, FESB is among the first that was built on the University of Split campus, and is among the biggest, not only in size, but in reputation which has been successfully built for more than 50 years. Today, FESB is gathering eminent experts for both teaching and scientific projects attracting more students every year. 235 employees, 148 teaching personnel, 107 with a doctorate degree, 10 classrooms, 9 amphitheatres, 11 computer equipped classrooms, 95 laboratories, 29477 square meters area. Student life on FESB has always been attracting a great number of students. Graduating from FESB has a particular importance and respect from the business world. A great number of graduated students developed successful careers and helped FESB's reputation. Many individuals were credited for this responsibility, and they were not afraid of walking ahead of their time, and showing what is

## ABOUT SPLIT

Split can be reached:

-by air: directly from Amsterdam, Brussels, Frankfurt, London, Lyon, Manchester, Munich, Paris, Vienna and via Zagreb from all world airports. For more information, visit Airport Split-Kaštela.

-by ship: Split harbor is daily connected with Ancona. Ship connections are also available with Bari.

JUNE 20–23  
2023

PROGRAM

Technically co-sponsored by:



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