

# **2021 6th International Conference on Smart and Sustainable Technologies (SpliTech 2021)**

**Bol and Split, Croatia  
8 – 11 September 2021**



**IEEE Catalog Number: CFP21F09-POD  
ISBN: 978-1-6654-4202-2**

**Copyright © 2021, University of Split, FESB  
All Rights Reserved**

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP21F09-POD
ISBN (Print-On-Demand):	978-1-6654-4202-2
ISBN (Online):	978-953-290-112-2

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# CONTENTS

## CONFERENCE TECHNICAL PROGRAM

### E-HEALTH

#### E-HEALTH – APPLICATIONS

- Deterministic Theory of Aerosol Displacement Before Dehydration as Vehicle of Virus in Outdoor Infections** 1  
*Huber Nieto-Chaupis (Peru & Universidad Autónoma del Perú, Peru)*
- How to maintain mental health in turbulent times: Can mobile applications be a part of the solution?** 6  
*Filip Mustac (University Hospital Centre Zagreb, Croatia); Mia Poturica (Community Health Centre Zagreb West, Croatia); Maša Alfirević (University Hospital Sveti Duh, Croatia); Sarah Bjedov, Sara Bestulić, Martina Matovinović and Darko Marčinko (University Hospital Centre Zagreb, Croatia)*
- Emergency Department: Reducing waiting time for lower acuity patients** 11  
*Mustafa H Abudalu (Doha & Hamad Bin Khalifa University, Qatar); Zaid Al Fagih (Independent Researcher, United Kingdom (Great Britain)); Brenno Castrillon Menezes (Hamad Bin Khalifa University & Qatar Foundation, Qatar); Luluwah Al-Fagih (Hamad Bin Khalifa University, Qatar & Kingston University, United Kingdom (Great Britain))*
- Wireless ECG device for heart rhythm monitoring during dental extractions-a pilot study** 17  
*Antonella Lešin (University Hospital of Split, Croatia); Ivana Medvedec Mikić (University of Split School of Medicine, Croatia); Ružica Bandić, Katarina Vodanović and Ivna Vuković Kekez (University of Split, School of Medicine, Croatia); Tina Becic (University Hospital of Split, Croatia); Ivan Tomašić (Mälardalen University, School of Innovation, Design and Engineering Västerås, Sweden); Katarina Vukojevic (University of Split, Croatia); Danijela Kalibovic Govorko (University of Split School of Medicine, Croatia)*
- Structural Health Monitoring: a system for the correct synchronization of the sensors** 24  
*Romina Paolucci, Giuseppe Ferri, Rocco Alaggio, Riccardo Cirella, Gianluca Barile and Vincenzo Stornelli (University of L'Aquila, Italy)*

#### E-HEALTH – SIGNAL PROCESSING

- In Search of Immunohistochemistry Quantification** 27  
*Ivana Solic and Katarina Vukojevic (University of Split, Croatia)*
- Histograms and 2D plot profiling for quantification of numerous immunofluorescent signals on entire panoramic photomicrographs: a new method description** 30  
*Roko Duplancic and Darko Kero (University of Split, School of Medicine, Croatia)*
- On Optimal Parameters for ICI-Based Adaptive Filtering Applied to the GWs in High Nois** 36  
*Nikola Lopac (University of Rijeka, Faculty of Maritime Studies & University of Rijeka, Center for Artificial Intelligence and Cybersecurity, Croatia); Jonatan Lerga (University of Rijeka & Faculty of Engineering, Croatia); Nicoletta Saulig (University of Pula, Croatia); Ljubisa Stankovic and Miloš Daković (University of Montenegro, Montenegro)*
- Electrical Consequences of Protein-Glucose Interactions in the Human Kidneys Professional paper** 42  
*Huber Nieto-Chaupis (Peru & Universidad Autónoma del Perú, Peru)*

### SMART CITY

## SMART CITIES – AI APPLICATIONS

- A New Composite Method of Modeling Bicycle Traffic using Convolutional Neural Networks and Genetic programming** 46  
Matej Babič (Faculty of Information studies, Novo mesto, Slovenia); Branko Šter (Faculty of Computer and Information Science, University of Ljubljana, Slovenia); Joel J. P. C. Rodrigues (Federal University of Piauí (UFPI), Brazil & Instituto de Telecomunicações, Portugal); Janez Povh (Faculty of Mechanical Engineering, University of Ljubljana, Slovenia)
- A Systematic Literature Review of Artificial Intelligence in Fashion Retail B2C** 52  
Leire Querejeta Lomas (University of Deusto, Spain); Aitor Goti Elordi (Deusto Digital Industry Chair, Spain); Aitor Almeida (DeustoTech - Deusto Institute of Technology, Spain); Diego López de Ipiña (University of Deusto, Spain)
- Evaluation of Transfer Learning Methods for Wood Knot Detection** 58  
Maja Braović (University of Split - FESB, 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); Mitja Plos (University of Ljubljana, Slovenia)
- Contextual Prediction of On-Street and Off-Street Parking Lot Utilisation: An Opening Gate Towards Sustainable Parking** 64  
Goran Jelen (Faculty of Electrical Engineering and Computing, Croatia); Jurica Babic (University of Zagreb & Faculty of Electrical Engineering and Computing, Croatia); Vedran Podobnik (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)
- Comparative Approach of Computational Models Applied to the Traveling Salesman Problem: A Case Study Performed at Tourist Points in the Ibiapaba Mountains, CE, Brazil** 70  
Anderson Passos de Aragão and João da Costa (Instituto Federal de Educação, Ciência e Tecnologia do Ceará, Brazil); Necio Lima Veras, Msc (Federal Institute of Ceara & IFCE, Brazil); Joel J. P. C. Rodrigues (Federal University of Piauí (UFPI), Brazil & Instituto de Telecomunicações, Portugal); Ricardo A. L. Rabelo (Federal University of Piauí (UFPI), Brazil)

## SMART CITIES – LOGISTICS

- SWANEE: a MLaaS solution for digital transformation and value creation in public and private sector** 76  
Valentina Chetta, Marco Del Coco, Alessio Camillò, Davide Storelli and Enza Giangreco (Engineering Ingegneria Informatica S.p.A., Italy); Rosaria Lovecchio and Boris Amico (Engineering Ingegneria Informatica SpA, Italy); Marco Alessi and Marco Pinnella (Engineering Ingegneria Informatica S.p.A., Italy)
- Smart City Configurations: A Conceptual Approach to Assess Smart City Practices and Outcomes** 81  
Petra Saskia Bayerl (Sheffield Hallam University, United Kingdom (Great Britain)); Vivien Butot (Erasmus University Rotterdam, The Netherlands)
- Towards a Digital Twin Framework for Adaptive Last Mile City Logistics** 88  
Abdelhadi Belfadel and Sebastian Hörl (Institute for Technological Research - IRT SystemX, France); Rodrigo Javier Tapia (Delft University of Technology, The Netherlands); Jakob Puchinger (Laboratoire Génie Industriel, CentraleSupélec, Université Paris Saclay & Institut de Recherche Technologique SystemX, France)
- The indicators of agricultural crops based on the remote sensing of the Earth (ERS)** 94  
Marzhan Anuarbekovna Sadenova, Marzhan Rakhymberdina and Natalya Kulenova (D. Serikbayev East Kazakhstan Technical University, Kazakhstan); Aseil Mamysheva (D. Serikbaeva East Kazakhstan Technical University, Kazakhstan); Assylkhanova Aleksandrovna (D. Serikbayev East Kazakhstan Technical University, Ust'-Kamenogorsk, Kazakhstan); Jiří Klemeš (Brno University of Technology – VUT Brno, Czech Republic)

## SMART CITIES – SOCIAL NETWORKS

- Transforming Social Media Posts into Volunteered Geographic Information using Data Mining Methods** 100  
Marina Tavra (University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Croatia); Ljiljana Šerić (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch., Croatia); Anka Lisec (University of Ljubljana, Faculty of Civil and Geodetic Engineering, Slovenia); Antonia Ivanda (University of Split - Faculty of El. Eng., Mech.

<i>Eng. and Naval Arch. Croatia, Croatia</i> ); Morena Galešić Divić (University of Split, Faculty of Civil Engineering, Architecture and Geodesy, Croatia)	
<b>Sustainable Platform for Environmental Changes in Smart City</b> Tetsuro Ueda (KDDI Research, Japan); Tomohiko Ogishi (KDDI Research, Inc., Japan)	<b>106</b>
<b>Study of Radical Views on Social Media: Classification and Group Dynamics Analysis</b> Rand Yasin, Saad Lutfi and Ajala Imene (University of Wollongong in Dubai, United Arab Emirates); Farhad Oroumchian (University of Wollongong in Dubai, Iran); May El Barachi (University of Wollongong Dubai, United Arab Emirates); Sujith Samuel Mathew (Zayed University, United Arab Emirates)	<b>112</b>
<b>An assessment of social media oil spill reports using transfer learning on remotely sensed images</b> Antonia Ivanda (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch. Croatia, Croatia); Saša Mladenović (University of Split & Faculty of Science, Croatia); Ljiljana Šerić (University of Split - Faculty of El. Eng., Mech. Eng. and Naval Arch., Croatia); Maja Braović (University of Split - FESB, Croatia)	<b>120</b>
<b>Temporal Behavioural Analysis of Extremists on Social Media: A Machine Learning Based Approach</b> Saad Lutfi and Rand Yasin (University of Wollongong in Dubai, United Arab Emirates); May El Barachi (University of Wollongong Dubai, United Arab Emirates); Farhad Oroumchian (University of Wollongong in Dubai, Iran); Ajala Imene (University of Wollongong in Dubai, United Arab Emirates); Sujith Samuel Mathew (Zayed University, United Arab Emirates)	<b>126</b>
<b>Social Coin: Blockchain-mediated incentivization of citizens for sustainable collaborative processes</b> Diego López-de-Ipiña DeustoTech, University of Deusto Bilbao, Spain, Jorge El Busto DeustoTech, University of Deusto Bilbao, Spain, Daniel Lauzurica DeustoTech, University of Deusto Bilbao, Spain, Diego Casado DeustoTech, University of Deusto Bilbao, Spain	<b>132</b>
<b>SMART CITIES – NETWORKS</b>	
<b>Rate Splitting in VCSEL-based Optical Wireless Networks</b> Khulood Alazwary, Ahmad Adnan Qidan, Taisir El-Gorashi and Jaafar Elmirghani (University of Leeds, United Kingdom (Great Britain))	<b>138</b>
<b>Q-Learning Algorithm for Resource Allocation in WDMA-based Optical Wireless Communication Networks</b> Abdelrahman Said Elgamal, Osama Zwaïd Alsulami, Ahmad Adnan Qidan, Taisir El-Gorashi and Jaafar Elmirghani (University of Leeds, United Kingdom (Great Britain))	<b>143</b>
<b>GPU-enabled Framework for Modelling, Determination and Simulation the LCR of Mobile Networks in Smart Cities Limited by <math>\eta</math>-<math>\mu</math> Distributed Fading and Interference</b> Dragana Krstić and Suad Suljovic (Faculty of Electronic Engineering, University of Niš, Serbia); Nenad Petrovic (University of Nis, Faculty of Electronic Engineering, Serbia); Sinisa Minić (Teachers College in Prizren - Leposavic, Serbia)	<b>148</b>
<b>Performance Analysis of LoRaWAN in an Air Quality Monitoring Applications for Smart Cities</b> Artur Veloso (Federal University of Piauí (UFPI), Brazil); Jocines Dela Flora Silveira (Universidade Federal do Piauí, Brazil); Mario Moura (Federal University of Piauí (UFPI), Brazil); José dos Reis, Jr. (Federal University of Piauí, Brazil); Ricardo A. L. Rabelo (Federal University of Piauí (UFPI), Brazil); Joel J. P. C. Rodrigues (Federal University of Piauí (UFPI), Brazil & Instituto de Telecomunicações, Portugal)	<b>154</b>

## **IOT: INTERNET OF THINGS**

### **IOT: INTERNET OF THINGS – AI IN IOT**

<b>Deep Learning based Eye gaze estimation and prediction</b> Pier Luigi Mazzeo (CNR, Italy); Dilan D'Amico (Università del Salento, Italy); Paolo Spagnolo (Consiglio Nazionale delle Ricerche, Italy); Cosimo Distanto (CNR, Italy)	<b>160</b>
--	------------

<b>A Deep Residual Star Generative Adversarial Network for multi-domain Image Super-Resolution</b>	<b>166</b>
<i>Rao Muhammad Umer, Asad Munir and Christian Micheloni (University of Udine, Italy)</i>	
<b>A Recommender System that safeguards the user privacy through Federated Learning</b>	<b>171</b>
<i>Ibai Guillen-Pacho, Ruben Sanchez-Corcuera and Diego Casado-Mansilla (University of Deusto, Spain)</i>	
<b>Tiny Machine Learning Techniques for Driving Behavior Scoring in a Connected Car Environment</b>	<b>176</b>
<i>Massimo Merenda and Vincenzo Mazzullo (University Mediterranea of Reggio Calabria, Italy); Riccardo Carotenuto (University "Mediterranea" of Reggio Calabria, Italy); Francesco G. Della Corte (University Mediterranea of Reggio Calabria, Italy)</i>	
<b>Evaluation and Optimization of Underwater Image Restoration Algorithms</b>	<b>182</b>
<i>Alan Le Boudec and Artur Mkrtychyan (University of Brest, France); Barbara Dzaja (University of Split, Croatia); Vincent Rodin (Université de Bretagne Occidentale, France); Hai Nam Tran (University of Brest, France)</i>	
<b>Driving style Categorisation based on Unsupervised Learning: a Step towards Sustainable Transportation</b>	<b>188</b>
<i>Ivana Gace, Dario Pevec and Hrvoje Vdović (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia); Jurica Babic (University of Zagreb &amp; Faculty of Electrical Engineering and Computing, Croatia); Vedran Podobnik (University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia)</i>	
<b>IOT: INTERNET OF THINGS – SOFTWARE AND CLOUD</b>	
<b>Fog Computing: Implementation of a Simple Fog Scenario Through IoT Public Services</b>	<b>194</b>
<i>Teodoro Montanaro, Ilaria Sergi, Stefano Limelli and Luigi Patrono (University of Salento, Italy)</i>	
<b>Towards Service Orchestration for the Cloud-to-Thing Continuum</b>	<b>200</b>
<i>Ivan Čilić (University of Zagreb Faculty of EE and Computing, Croatia); Ivana Podnar Zarko and Mario Kusek (University of Zagreb, Croatia)</i>	
<b>A Smart IoT-aware backyard poultry farming exploiting low cost and low power technologies</b>	<b>207</b>
<i>Angela-Tafadzwa Shumba, Teodoro Montanaro, Ilaria Sergi, Massimo De Vittorio and Luigi Patrono (University of Salento, Italy)</i>	
<b>Enhancing Voice Assistants: A Proactive Approach</b>	<b>213</b>
<i>Paolo Panarese (Università del Salento &amp; VidyaSoft, Italy); Elisa Meraglia (Università del Salento, Italy); Roberto Vergallo and Luca Mainetti (University of Salento, Italy)</i>	
<b>IOT: INTERNET OF THINGS – SOFTWARE AND SYSTEMS</b>	
<b>A lightweight semantic-location system for indoor and outdoor behavior modelling</b>	<b>217</b>
<i>Aritz Bilbao (DEUSTO, Spain); Xabier Cantero (DeustoTech, Universidad de Deusto, Bilbao, Spain); Aitor Almeida (DeustoTech - Deusto Institute of Technology, Spain); Luca Fasano, Teodoro Montanaro, Ilaria Sergi and Luigi Patrono (University of Salento, Italy)</i>	
<b>Monitoring IoT Platform for the Aerospace Manufacturing Industry</b>	<b>222</b>
<i>Daniel Rodrigues and Paulo Carvalho (Centro Algoritmi, Universidade do Minho, Portugal); Solange Rito Lima (Centro Algoritmi, Universidade do Minho, Portugal); Emanuel Lima and Nuno Vasco Lopes (DTx: Digital Transformation CoLAB, Portugal)</i>	
<b>IoT Deployment for Smart Building: Water Consumption Analysis</b>	<b>228</b>
<i>Adrijana Vrsalović and Ivo Andric (University of Split, Croatia); Toni Perkovic (University of Split, FESB, Croatia); Marin Aglič (University of Split, Croatia); Petar Solic (University of Split &amp; FESB, Croatia)</i>	
<b>Web publishing and visualization of real-time data</b>	<b>233</b>
<i>Damir Ivanković (Institute of Oceanography and Fisheries, Croatia)</i>	
<b>State of art and Proposal Development of a Street Lighting System Using Artificial Vision</b>	<b>236</b>
<i>Richard Reyes (Universidad Distrital Francisco José de Caldas, Colombia)</i>	

## **IOT: INTERNET OF THINGS – HARDWARE**

- An IoT M2M Architecture for BMS Using Multiple Connectivity Technologies: A Practical Approach** 242  
Vasileios Georgios Vasilopoulos, Asimina Dimara, Stelios Krinidis, Petros Almpanis, Nikolaos Margaritis and Nikolaos Nikolopoulos (Centre for Research and Technology Hellas, Greece); Dimosthenis Ioannidis (Information Technologies Institute, Greece); Dimitrios Tzovaras (Centre for Research and Technology Hellas, Greece)
- An IoT-aware smart system to detect thermal comfort in industrial environments** 248  
Ilaria Sergi, Teodoro Montanaro, Angela-Tafadzwa Shumba, Luca Catarinucci and Riccardo Colella (University of Salento, Italy); Simona Del Ferraro and Paolo Lenzuni (INAIL, Italy); Luigi Patrono (University of Salento, Italy)
- An IoT-Based Smart Energy Meter With Real-Time Power Tracking System: A Review** 254  
Md. Hasibul Islam and Touhidul Islam Talukder (American International University-Bangladesh, Bangladesh); Fatema Tauze Zohora Saima (American International University, Bangladesh); Md. Nur Islam Rimon (American International University Bangladesh, Bangladesh); Javed Ali (American International University, Bangladesh)
- An Efficient Method for Remote Control and Cloud Based Monitoring of Industrial Equipment over GSM Network** 259  
Dibyayan Patra (Vellore Institute of Technology, Vellore, India); Suresh Chavhan (Vellore Institute of Technology, India); Deepak Gupta (Maharaja Agrasen Institute of Technology, GGSIP University, India); Ashish Khanna (GGSIP University, India); Joel J. P. C. Rodrigues (Federal University of Piauí (UFPI), Brazil & Instituto de Telecomunicações, Portugal)
- Blockchain Technology based on Algorand applied to low-power and low-cost IoT devices** 265  
Teodoro Montanaro, Iliaria Sergi, Salvatore Corvaglia and Luca Mainetti (University of Salento, Italy); Antonio Vilei and Andrea Palmieri (STMicroelectronics, Italy); Beatrice Rossi (STM, Italy); Luigi Patrono (University of Salento, Italy)
- The use of Bluetooth Mesh Networking in IoT-aware Applications** 271  
Ilaria Sergi, Teodoro Montanaro, Maria Gammariello and Luigi Patrono (University of Salento, Italy)

## **IOT: INTERNET OF THINGS – SENSORS**

- IoT infrared sensor for continuous monitoring of building envelope thermal performances** 277  
Serena Serroni, Milena Martarelli and Gian Marco Revel (Università Politecnica delle Marche, Italy); Marco Arnesano (Università eCampus, Italy); Giuseppe Pandarese (Università Politecnica delle Marche, Italy)
- The Optical Subsystem for the Dust Concentration Measuring Portable System** 283  
Andrey N. Kokoulin (Perm National Research Polytechnical University & Federal Scientific Center for Medical and Preventive Health Risk Management Technologies, Russia); Sergey Zagorodnov and Irina May (Center for Medical and Preventive Health Risk Management Techs, Russia)
- Estimation of average wind speed in the city of Tianguá using Artificial Neural Network** 289  
Anderson Passos de Aragão (Instituto Federal de Educação, Ciência e Tecnologia do Ceará, Brazil); Arilson Fernando Gomes Ferreira (Instituto Federal de Educação, Ciência e Tecnologia do Ceará & SBC, Brazil); Necio Lima Veras, Msc (Federal Institute of Ceara & IFCE, Brazil); Ricardo A. L. Rabelo (Federal University of Piaui (UFPI), Brazil); Petar Solic (University of Split & FESB, Croatia)
- Smart Sensor System for Detecting Temperature Changes by Polarized Light** 295  
Martin Kyselak (University of Defense, Czech Republic); David Grenar (Brno University of Technology, Czech Republic); Karel Slavicek (Masaryk University, Czech Republic)
- An investigation on duty-cycle for particulate matter monitoring with light-scattering sensors** 298  
Pietro Chiavassa, Filippo Gandino and Edoardo Giusto (Politecnico di Torino, Italy)

## **ENERGY**

### **ENERGY – RENEWABLE ENERGY TECHNOLOGIES**

<b>Performance assessment of a trapezoidal concentrated photovoltaic - thermoelectric system</b>	<b>304</b>
<i>Aminu Yusuf (Istanbul University-Cerrahpaşa, Turkey); Sedat Ballıkaya (Istanbul University, Turkey); Rahma Tabakh (Istanbul University-Cerrahpaşa, Turkey)</i>	
<b>Industrial Pressure Measurement for a Thermo-Electric Hybrid Solar System</b>	<b>309</b>
<i>Andrei Burta, Roland Szabo and Aurel Gontean (Politehnica University Timisoara, Romania)</i>	
<b>Simple PWM Generation using Serial Interface for a Circulation Pump used in Solar Water Heaters</b>	<b>313</b>
<i>Andrei Burta, Roland Szabo and Aurel Gontean (Politehnica University Timisoara, Romania)</i>	
<b>Degradation Avoiding Start Up and Shut Down of Fuel Cell Stacks for Automotive Application Using Two Plant Model Predictive Control</b>	<b>317</b>
<i>Martin Vrlıć (Technische Universität Wien, Austria); Stefan Jakubek (Vienna University of Technology, Austria)</i>	
<b>Optimal size of the photovoltaic power plant construction with regard to the cost-effectiveness of investments</b>	<b>323</b>
<i>Josip Jakab (University of Osijek &amp; Faculty of Dental Medicine and Health Osijek, Croatia); Velimir Golub (Vodovod d. o. o, Croatia); Goran Knežević (Faculty of Electrical Engineering, Computer Science and Information Technology Osijek, Croatia); Alen Čalušić (ELTERM d. o. o., Croatia)</i>	
<b>ENERGY – ENERGY EFFICIENCY IN BUILDINGS</b>	
<b>Unsupervised Clustering for Pattern Recognition of Heating Energy Demand in Buildings Connected to District-Heating Networks</b>	<b>329</b>
<i>Mikel Lumbreras, Koldobika Martin and Gonzalo Diarce (Faculty of Engineering of Bilbao University of the Basque Country(Spain); Roberto Garay and Ruben Mulero (TECNALIA, Basque Research and Technology Alliance (BRTA), Spain)</i>	
<b>Energy Performance of Buildings: improvements, limits and future perspectives during the last twenty years of energy and sustainability policies</b>	<b>334</b>
<i>Fabrizio Ascione (Università degli studi di Napoli Federico II, Italy); Margherita Mastellone (Università degli Studi di Napoli Federico II, Italy); Giuseppe Peter Vanoli and Francesco Tariello (Università degli studi del Molise, Italy); Silvia Ruggiero and Rosa Francesca De Masi (Università degli Studi del Sannio, Italy)</i>	
<b>Energy refurbishment of an Office Building by addition of a second skin: Improvement of thermal behavior, energy performance and possible conversion by PV</b>	<b>340</b>
<i>Teresa Iovane (Università degli Studi di Napoli Federico II, Italy); Fabrizio Ascione and Nicola Bianco (Università degli studi di Napoli Federico II, Italy); Filippo De Rossi (Università degli Studi di Napoli Federico II, Italy); Gerardo Maria Mauro (Università degli studi del Sannio, Italy)</i>	
<b>Designing a generalised reward for Building EnergyManagement Reinforcement Learning agents</b>	<b>346</b>
<i>Ruben Mulero and Beñat Arregi (TECNALIA, Basque Research and Technology Alliance (BRTA), Spain); Iñigo Mendialdua (University of the Basque Country (UPV/EHU), Spain); Roberto Garay (TECNALIA, Basque Research and Technology Alliance (BRTA), Spain)</i>	
<b>On the sunspace utilization in a detached house in climatic conditions of Istanbul</b>	<b>352</b>
<i>Murat Uludaş, Muslum Arıcı, Ekrem Tunçbilek and Çağatay Yıldız (Kocaeli University, Turkey)</i>	
<b>Evaluation of Yalova University Engineering Faculty Building with SBTool</b>	<b>358</b>
<i>Aybike Koc, Aysegül Bahadıroğlu, Umit Unver and Esra Parlak (Yalova University, Turkey)</i>	
<b>ENERGY – ENERGY EFFICIENCY</b>	
<b>Numerical Investigation Of The Performance Of Local Exhaust Strategy In Intensive Care Units</b>	<b>364</b>
<i>Mustafa Yılmazoğlu (Gazi University, Turkey); Altug Alp Erdogan (Gazi University &amp; Davitap Engineering Corp., Turkey)</i>	
<b>Influence of forecast control of heat supply on supply temperature</b>	<b>370</b>
<i>Tomasz Cholewa, Alicja Siuta-Olcha, Andrzej Smolarz and Piotr Muryjas (Lublin University of Technology, Poland); Piotr Wolszczak (University of Lublin, Poland); Łukasz Guz (Lublin University of Technology, Poland)</i>	



**An Ultrasonic Application to Evaluate Energy Costs of Air Leakages at the Compressed Air Systems** 373  
Eren Soylu (Günşel Electric Vehicles, Turkey); Hilal Bilgin (Türkiye Şişe ve Cam Fabrikaları A.Ş., Turkey); Selman Çağman (Kocaeli Üniversitesi University, Turkey); Umit Unver (Yalova University, Turkey)

**Detailed numerical and experimental analysis of commonly used measures for achieving near complete combustion in the residential combustion appliances** 376  
Ivan Horvat, Damir Dović and Petar Filipović (University of Mechanical Engineering and Naval Architecture, Croatia)

**D<sup>2</sup>EPC: Next Generation Digital and Dynamic Energy Performance Certificates** 381  
Stavros Koltsios (Center for Research and Technology Hellas (CERTH), Greece); Apostolos C. Tsolakis (Centre for Research and Technology Hellas, Greece); Paris Fokaides (Frederick University, Cyprus); Angeliki Katsifaraki (Hypertech S.A., Greece); Gerfried Cebert (Senercon GmbH, Germany); Andrius Jurelionis (Kaunas University of Technology, Lithuania); Christos Contopoulos (Geosystems Hellas S.A., Greece); Panagiota Chatzipanagiotidou (Center for Research and Technology Hellas, Greece); Christos Malavazos (Hypertech S.A., Greece); Dimosthenis Ioannidis (Information Technologies Institute, Greece); Dimitrios Tzovaras (Centre for Research and Technology Hellas, Greece)

## **ENERGY – CIRCULAR ECONOMY AND ENVIROMENTAL IMPACTS I**

**Energy potential of separately collected biowaste as raw material for a biogas plant - case study of Virovitica-Podravina County in Croatia** 387  
Neven Voća (University of Zagreb Faculty of Agriculture, Croatia); Bojan Ribić (Zagreb Holding, Croatia)

**Overview of the Methodology Developments in Water-Energy Nexus Studies** 393  
Xuexiu Jia (Brno University of Technology, Czech Republic); Jiří Klemeš and Petar Varbanov (Brno University of Technology – VUT Brno, Czech Republic); Sharifah Wan Alwi (Universiti Teknologi Malaysia (UTM), Malaysia)

**Hybrid Vehicles Emissions Assessment** 398  
Ante Kozina, Gojmir Radica and Sandro Nizetic (University of Split, FESB, Croatia)

**Life Cycle Assessment (LCA) and Multi-response Surface Methodology (MRS) to improve biodiesel production from used cooking oil** 403  
Marina Corral Bobadilla, Ruben Lostado Lorza and Saúl Iñiguez Macedo (University of La Rioja, Spain); Fátima Somovilla Gómez (San José de Calasanz 31, Spain & Universidad de La Rioja, Spain)

**Minimisation of the Energy Resource Demands and Environmental Footprints for Industrial and Urban Symbiosis using the Circularity Concept** 409  
Petar Varbanov (Brno University of Technology – VUT Brno, Czech Republic); Limei Gai (Brno University of Technology, Czech Republic); Hon Huin Chin (Brno University of Technology – VUT Brno, Czech Republic); Jiří Klemeš (Brno University of Technology, Czech Republic)

**Characterization and enhancement of oil shale fly ash from CFB boiler** 415  
Heliis Pikkor, Oliver Järvik, Heidi Lees, Alar Konist, Andres Siirde and Birgit Maaten (Tallinn University of Technology, Estonia)

## **ENERGY – CIRCULAR ECONOMY AND ENVIROMENTAL IMPACTS II**

**Coupling of Euler Eulerian and Euler Lagrangian Spray Methods with Chemistry Kinetics for Modeling of Reactive Flow and Pollutant Formation** 419  
Filip Jurić (University of Zagreb, Croatia); Milan Vujanović (Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb, Croatia); Zvonimir Petranović (AVL List GmbH, Austria)

**Plastic Waste Categorisation using Machine Learning Methods-Metals Contaminations** 425  
Hon Huin Chin, Petar Varbanov and Jiří Klemeš (Brno University of Technology – VUT Brno, Czech Republic)

**Construction typologies for energy upgrade in terms of thermophysical analysis and operational measurements in non residential buildings** 431

<i>Effrosyni Giama, Panagiota Antoniadou and Elli Kyriaki (Aristotle University of Thessaloniki, Greece); Maria Symeonidou (Aristotle University Thessaloniki, Greece); Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece)</i>	
<b>Roles of E-waste in a Circular Economy: EU-27</b>	<b>436</b>
<i>Yee Van Fan and Jiří Klemeš (Brno University of Technology, Czech Republic); Chew Tin Lee (Universiti Teknologi Malaysia, Malaysia)</i>	
<b>Estimating Livestock Greenhouse Gas Emissions: Existing Models, Emerging Technologies and Associated Challenges</b>	<b>440</b>
<i>Drisy Alex Thumba, Sanja Lazarova-Molnar and Parisa Niloofer (University of Southern Denmark, Denmark)</i>	
<b>Towards the full automation of low emissions inland intermodal terminal</b>	<b>446</b>
<i>Augusto Urru, Marco Bonini, Giuliano Ferraro, Mert Mete and Tuan Nguyen (Reutlingen University, Germany); Hans G. Unseld (CargoResearch, Austria); Wolfgang Echelmeyer (Reutlingen University, Germany)</i>	
<b>ENERGY – SMART ENERGY SYSTEMS AND MODELLING</b>	
<b>Development of Smart Grid Standards in View of Energy System Functionalities</b>	<b>454</b>
<i>Anna Mutule and Irina Antoskova (Institute of Physical Energetics, Latvia); Christina Papadimitriou and Venizelos Efthymiou (University of Cyprus, Cyprus); Andrei Morch (Norway)</i>	
<b>An Online Optimization Approach for Plug-in Electric Vehicle Integration into the Electrical Grid</b>	<b>460</b>
<i>Ona Egbue (University of South Carolina Upstate, USA)</i>	
<b>Modelling of the low voltage distribution network for the integration of distributed generation and charging stations for electric vehicles</b>	<b>464</b>
<i>Rebeka Raff (Public Institution Development Agency of Osijek-Baranja County, Croatia); Mato Vuković (HEP ODS Ltd. Elektra Požega, Croatia); Danijel Topić and Zvonimir Šimić (J. J. Strossmayer University of Osijek, Croatia)</i>	
<b>Smart Green Agriculture on Industrially Polluted Agricultural Landscapes</b>	<b>470</b>
<i>Marzhan Rakhymberdina, Marzhan Anuarbekovna Sadenova and Natalya Kulenova (D. Serikbayev East Kazakhstan Technical University, Kazakhstan); Utegenova Erkinovna (Technical University, Ust'-Kamenogorsk, Kazakhstan); Jiří Klemeš (Brno University of Technology – VUT Brno, Czech Republic)</i>	
<b>Local Electricity and Flexibility Markets: SWOT Analysis and Recommendations</b>	<b>476</b>
<i>Evgenia Kapassa, Marios Touloupou and Marinos Themistocleous (University of Nicosia, Cyprus)</i>	
<b>Machine Learning Model Identification for Forecasting of Soya Crop Yields in Kazakhstan</b>	<b>482</b>
<i>Nail Alikuly Beisekenov and Marzhan Anuarbekovna Sadenova (D. Serikbayev East Kazakhstan Technical University, Kazakhstan); Jin Wang (SPIL, NETME Centre, Faculty of Mechanical Engineering, Brno, Czech Republic); Jiří Klemeš and Petar Varbanov (Brno University of Technology – VUT Brno, Czech Republic); Tamerlan Anuarbekov (L. N. Gumilyov Eurasian National University, Kazakhstan)</i>	
<b>ENERGY – ENERGY SYSTEM, PROCESSES AND OPTIMISATION</b>	
<b>Optimisation of heat energy distribution in Tomsk City by inter-cluster connections model implemented in P-graph environment</b>	<b>488</b>
<i>Maxim Kuznetsov and Svyatoslav Tsubulskiy (Tomsk Polytechnic University, Russia); Botagoz Kaldybaeva (M. Auezov South Kazakhstan State University, Kazakhstan); Stanislav Boldyryev (Tomsk Polytechnic University, Russia)</i>	
<b>Marine engines running on hydrogen additive in diesel fuel for emission reduction</b>	<b>494</b>
<i>Gojmir Radica (University of Split, Croatia); Tomislav Mrakovcic (University of Rijeka, Faculty of Engineering, Croatia); Nikola Račić (University of Split, Faculty of Maritime Studies, Croatia); Maro Jelić (University of Dubrovnik, Croatia); Branko Lalić (University of Split, Faculty of Maritime Studies, Croatia); Vladimir Pelić (University of Rijeka, Faculty of Engineering, Croatia); Karlo Bratić (University of Split, Faculty of Maritime Studies, Croatia); Ante Kozina (University of Split, FESB, Croatia); Domagoj Bulat (University of Split, Faculty of Maritime Studies, Croatia)</i>	
<b>Overview of technical and operational measures for emission reduction in the marine sector</b>	<b>497</b>

Stjepan Herceg, Luka Boban, Vladimir Soldo and Nikola Vladimir (University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Croatia)

**Overview of Hydrogen Refueling Stations and Spatial Occupancy Assessment: A Preliminary Results of the Case Study in Croatia** 503  
Ivan Pivac and Jakov Šimunović (FESB, University of Split, Croatia); Frano Barbir (University of Split, FESB, Croatia); Nikola Plavec and Ivan Andročec (Hrvatska Elektroprivreda (HEP) d. d., Croatia)

**Modelling energy consumption in Spain with metaheuristic methods** 508  
Basharat Jamil, Lucia Lujan and Jose Colmenar (Universidad Rey Juan Carlos, Móstoles, Madrid, Spain)

## **ENERGY – ADVANCED POWER SYSTEMS**

**Exploratory data analysis to evaluate the propagation of disturbances originating in a short circuit** 511  
Fabbio Borges (UESPI, Brazil); José Lima Filho (Universidade Federal do Piauí, Brazil & Universidade Estácio de Sá, Brazil); Ricardo Fernandes (Federal University of Sao Carlos, Brazil); Ricardo A. L. Rabelo (Federal University of Piaui (UFPI), Brazil)

**A comparison framework for fault classification methods in power system distribution network** 517  
Enio Viana (Federal University of Piaui (UFPI), Brazil); Aldir Sousa (State University of Piaui (UESPI), Brazil); Ricardo A. L. Rabelo (Federal University of Piaui (UFPI), Brazil); Flávio Araújo (Federal University of Piauí, Brazil); Petar Solic (University of Split & FESB, Croatia)

**Generation of Non-Isolated Radial Configuration in Distributed Power Systems** 524  
Enio Viana (Federal University of Piaui (UFPI), Brazil); Aldir Sousa (State University of Piaui (UESPI), Brazil); Ricardo A. L. Rabelo (Federal University of Piaui (UFPI), Brazil)

**A Two-Stage Approach to Solve Voltage-Stability/Security-Constrained Optimal Power Flow Auction Systems by means of PSO and the Continuation Power Flow** 530  
Enza Rafaela de Sampaio Ferreira (Universidade Federal do Piauí, Brazil); Rafael Barros (Federal University of Piaui (UFPI), Brazil); Joaquim Gaspar (Federal University of Sao Carlos (UFSCAR), Brazil); Guilherme Lage (Universidade Federal de São Carlos, Brazil); Ricardo A. L. Rabelo (Federal University of Piaui (UFPI), Brazil)

## **ENERGY – ENERGY SYSTEMS: UTILIZATION AND PROCESSES**

**Reliability and Availability Methodology in Cooling Plant Maintenance** 536  
Krešimir Osman and Tpiimir Alajbeg (Zagreb University of Applied Sciences, Croatia)

**Effect of Steam Activation on Oil Shale Semi-coke Surface Properties** 542  
Heliis Pikkor, Alar Konist, Birgit Maaten, Oliver Järvik and Heidi Lees (Tallinn University of Technology, Estonia)

**Combined simulation and virtualization approach for interconnected substation automation** 547  
Dennis Rösch (Fraunhofer IOSB-AST, Germany); Steffen Nicolai (Advanced System Technology (AST) Branch of Fraunhofer IOSB, Germany); Peter Bretschneider (Fraunhofer IOSB & Institutsteil Angewandte Systemtechnik AST, Germany)

**Membrane Separation for Light Hydrocarbons Recovery in the Petrochemical Industry** 553  
Limei Gai (Brno University of Technology, Czech Republic); Petar Varbanov (Brno University of Technology – VUT Brno, Czech Republic); Yee Van Fan and Jiří Klemeš (Brno University of Technology, Czech Republic)

**Developments in marine hybrid propulsion** 558  
Maro Jelić (University of Dubrovnik, Croatia); Gojmir Radica (University of Split, Croatia); Nikola Račić (University of Split, Faculty of Maritime Studies, Croatia); Vedran Mrzljak (University of Rijeka, Croatia)

## **ENGINEERING MODELING**

### **ENGINEERING MODELING - MODELLING TECHNIQUES**

**Parallelism and Iterative bi-Lanczos Solvers** 564

*Josip Basic (University of Split, Croatia); Branko Blagojević and Martina Bašić (FESB University of Split, Croatia); Marjan Sikora (University of Split, Croatia)*

**Modeling EPAS system including the exponential spring friction element** 570  
*Damir Sedlar (University of Split, Croatia); Luka Kreso (FESB, University of Split, Croatia)*

**p-refined RBF-FD solution of a Poisson problem** 575  
*Mitja Jančič (Institute Jozef Stefan, Slovenia); Jure Slak (Jožef Stefan Institute & University of Ljubljana, Slovenia); Gregor Kosec (Jožef Stefan Institute, Slovenia)*

## **ENGINEERING MODELING - APPLICATIONS**

**Hampson Linde Cryo genic Cooler Modeling and Optimization in Matlab/Simulink** 581  
*Mihnea-Antoniou Covaci and Lorant Szolga (Technical University of Cluj-Napoca, Romania)*

**A Study of a Scissor-like Lift Manipulator for the Actuation Mechanism of a Self Cleaning System Using Shape Memory Alloy** 586  
*Nasir Hariri (Imam Abdulrahman Bin Faisal University, Saudi Arabia)*

**Electrical Currents from Diffusion Equation and Electrodynamics at Targeted Drug Delivery Strategies** 592  
*Huber Nieto-Chaupis (Universidad Autónoma del Perú)*

**Absorbed Power Density at the Surface of Planar Tissue due to Radiation of Dipole Antenna** 597  
*Dragan Poljak (University of Split, Croatia); Vicko Doric (University of Split, FESB, Croatia); Anna Šušnjara (University of Split & FESB, Croatia)*

**Development of laser heat treatment process for assisted forming of aluminum alloys** 603  
*Nuno Peixinho (University of Minho, Portugal); Rui Pereira and Vítor Carneiro (Universidade do Minho, Portugal); Sérgio Costa and Vítor Blanco (Bairrimoldes Lda., Portugal)*

## **ENGINEERING MODELING - COMPUTATIONAL ELECTROMAGNETICS**

**Unit Cube Test for Double Surface Integrals in Frequency Domain Integral Equation Formulations** 607  
*Mario Cvetković (University of Split, Croatia); Dragan Poljak (University of Split, FESB, Croatia); Ante Lojić Kapetanović (University of Split, Croatia); Hrvoje Dodig (University of Split, Faculty of Maritime Studies & Naval Electronic Center, PCE, Croatia)*

**Testing Machine Learning at Classical Electrodynamics** 613  
*Huber Nieto-Chaupis (Peru & Universidad Autónoma del Perú, Peru)*

**Application of Automatic Differentiation in Electromagnetic Dosimetry - Assessment of the Absorbed Power Density in the mm Wave Frequency Spectrum** 618  
*Ante Lojić Kapetanović and Dragan Poljak (University of Split, Croatia)*

## **RFID**

### **RFID - RFID/IOT WIRELESS TECHNOLOGIES FOR WEARABLE APPLICATIONS**

**An Eighth Mode Wearable Textile SIW Antenna for Lo-Ra and RFID Applications** 624  
*Giovanni Andrea Casula (Università di Cagliari, Italy); Giorgio Montisci and Giacomo Muntoni (University of Cagliari, Italy); Hendrik Rogier (Ghent University, Belgium)*

**Smart mask for temperature monitoring with LoRa backscattering communication** 628  
*Marc Lazaro (Rovira i Virgili University, Spain); Antonio Lazaro, Ramon Villarino and David Girbau (Universitat Rovira i Virgili, Spain)*

**Co-Designed Technology for Elderly Care: Mobile Robots and Passive RFID for Nighttime Safety** 632  
*Mirka Leino, Sari Merilampi and Pauli Valo (Satakunta University of Applied Sciences, Finland); Zahangir Khan and Johanna Virkki (Tampere University, Finland)*

<b>Wearable Bluetooth Low Energy Based Miniaturized Detection Node for Blind Spot Detection and Warning System on Vehicles</b>	<b>636</b>
<i>Nick De Raeve, Quinten Van den Brande and Matthias De Schepper (Ghent University, Belgium); Jo Verhaevert (Ghent University - imec, Belgium); Patrick Van Torre and Hendrik Rogier (Ghent University, Belgium)</i>	
<b>Design and Experimental characterization of on-skin Loop Antenna for next 5G Backscattering-based Communications</b>	<b>641</b>
<i>Francesco Romoli Venturi (University of Roma "Tor Vergata", Italy); Cecilia Occhiuzzi (University of Roma Tor Vergata &amp; DICII, Italy); Gaetano Marrocco (University of Rome Tor Vergata, Italy)</i>	
<b>RFID – AUGMENTED RFID TAGS AND ANTENNAS FOR SENSING APPLICATIONS</b>	
<b>RFID Sensors for the Monitoring of Body Temperature and Respiratory Function: a Pandemic Prospect</b>	<b>645</b>
<i>Nicoletta Panunzio (University of Rome Tor Vergata, Italy); Giulio M. Bianco (University of Roma Tor Vergata, Italy); Cecilia Occhiuzzi (University of Roma Tor Vergata &amp; DICII, Italy); Gaetano Marrocco (University of Rome Tor Vergata, Italy)</i>	
<b>Device-free hand gesture recognition exploiting Machine Learning applied to RFID</b>	<b>650</b>
<i>Massimo Merenda (University Mediterranea of Reggio Calabria, Italy); Giuseppe Cimino (University Mediterranea di Reggio Calabria, Italy); Riccardo Carotenuto (University "Mediterranea" of Reggio Calabria, Italy); Francesco G. Della Corte and Demetrio Iero (University Mediterranea of Reggio Calabria, Italy)</i>	
<b>Exploiting RFID technology for Indoor Positioning</b>	<b>655</b>
<i>Massimo Merenda (University Mediterranea of Reggio Calabria, Italy); Luca Catarinucci (University of Salento, Italy); Riccardo Colella (National Research Council (CNR), Italy); Francesco G. Della Corte (University Mediterranea of Reggio Calabria, Italy); Riccardo Carotenuto (University "Mediterranea" of Reggio Calabria, Italy)</i>	
<b>Give me a Sign: Passive Pose-Time Coded Handshaking</b>	<b>660</b>
<i>Stewart Thomas (Bucknell University, USA); Brian Degnan (Georgia Institute of Technology, USA)</i>	
<b>Customized UHF RFID Sensor Tags to Feed Biomechanical Models</b>	<b>665</b>
<i>Riccardo Colella (University of Salento, Italy); Maria Rosaria Tumolo (Institute for Research on Population and Social Policies, Italy); Saverio Sabina and Carlo Giacomo Leo (Institute of Clinical Physiology, Italy); Pierpaolo Mincaroni (National Research Council (CNR), Brindisi, Italy); Roberto Guarino (Institute of Clinical Physiology (IFC) National Research Council of Italy (CNR), Italy); Luca Catarinucci (University of Salento, Italy)</i>	
<b>Small printed antenna for soil sensors</b>	<b>669</b>
<i>Maja Škiljo and Zoran Blažević (University of Split, Croatia); Petar Solic (University of Split &amp; FESB, Croatia); Toni Perkovic (University of Split, FESB, Croatia)</i>	
<b>RFID – RFID ENABLED SYSTEMS FOR INDUSTRY AND SOCIETY: RFID&amp;ROBOTS</b>	
<b>Drone Interrogation (and its Low-Cost Alternative) in Backscatter Environmental Sensor Networks</b>	<b>672</b>
<i>Emmanouil Andrianakis, Georgios Vougioukas, Evangelos Giannelos, Orestis Giannakopoulos, Georgios Apostolakis, Konstantinos Skyvalakis and Aggelos Bletsas (Technical University of Crete, Greece)</i>	
<b>Autonomous Robots, Drones and Repeaters for Fast, Reliable, Low-Cost RFID Inventorying &amp; Localization</b>	<b>678</b>
<i>Antonis G Dimitriou, Anastasios Tzitzis, Alexandros Filotheou, Spyros Megalou, Stavroula Siachalou, Aristidis Raptopoulos Chatzistefanou, Andreana Malama, Emmanouil Tsardoulis and Konstantinos Panayiotou (Aristotle University of Thessaloniki, Greece); Evangelos Giannelos (Technical University of Crete, Greece); Theodore G Vasiliadis, Ioannis Mouroutsos and Ioannis Karanikas (Trinity Systems, Greece); Loukas Petrou and Andreas Symeonidis (Aristotle University of Thessaloniki, Greece); John Sahalos (Aristotle University of Thessaloniki, GR, Thessaloniki, Greece &amp; University of Nicosia, CY, Nicosia, Cyprus); Traianos Yioultis (Aristotle University of Thessaloniki, Greece); Aggelos Bletsas (Technical University of Crete, Greece)</i>	
<b>Interaction of a Social Robot with Visitors inside a Museum through RFID Technology</b>	<b>684</b>
<i>Sofia Pliasa and Anna Maria Velentza (University of Macedonia, Greece); Antonis G Dimitriou (Aristotle University of Thessaloniki, Greece); Nikos Fachantidis (University of Macedonia, Greece)</i>	
<b>The MONITOR Project: RFID-based Robots enabling real-time inventory and localization in warehouses and retail areas</b>	<b>690</b>

Fabio Bernardini, Andrea Motroni, Paolo Nepa and Alice Buffi (University of Pisa, Italy); Paolo Tripicchio (Scuola Superiore Sant'Anna, Italy); Luca Del Col (Partitalia, Italy)

## **RFID – RFID ENABLED SYSTEMS FOR INDUSTRY AND SOCIETY**

**An RFID-based Ranging System for Worker Safety in Agricultural Working Areas** 696  
Andrea Motroni, Francesca Rosati, Paolo Nepa and Alice Buffi (University of Pisa, Italy); Marco Pirozzi, Luciano Di Donato, Laura Tomassini and Alessandra Ferraro (INAIL, Italy)

**UHF RFID System for the Predictive Maintenance of a Filter Press: a real use case** 702  
Cecilia Occhuzzi (University of Roma Tor Vergata & DICII, Italy); Sara Amendola (University of Rome Tor Vergata & Radio6sense srl, Italy); Nicola D'Uva (RADIO6ENSE srl, Italy); Simone Nappi (University of Rome Tor Vergata & Radio6sense srl, Italy); Marco Ramacciotti (ISE srl, Italy); Francesca Camera (University of Rome Tor Vergata, Italy); Carolina Miozzi (University of Rome "Tor Vergata", Italy); Gaetano Marrocco (University of Rome Tor Vergata, Italy); Edoardo Zambonini (ISE srl, Italy)

**Box size estimation using ANNs in UHF RFID gates from interrogation process features** 706  
Javier Vales-Alonso (Universidad Politécnica de Cartagena, Spain); Pablo Lopez-Matencio (Technical University of Cartagena, Spain)

**UHF RFID Wireless Monitoring System for Graded Range of Motion Arc of Shoulder Rehabilitation** 711  
Chon In Wong (University of Macau, Macao)

**The Use of RFID Technology for the Collection Management in the Archaeological Museum of Thessaloniki** 714  
Maria Dermenoudi, Dimitris Karolidis, Aggeliki Moneda and Vasiliki Drakaki (Archaeological Museum of Thessaloniki, Greece); Antonis G Dimitriou (Aristotle University of Thessaloniki, Greece)

**Machine Learning as Tag Estimation Method for ALOHA-based RFID system** 720  
Lea Dujčić Rodić (FESB, University of Split, Croatia); Ivo Stancic (University of Split, Croatia); Kristina Zovko (University of Split, FESB, Croatia); Petar Solic (University of Split & FESB, Croatia)

## **RFID – RFID/IOT NEW DEVICES/APPROACHES**

**The Promising Role of 3D-printed Dielectric Resonator Antennas in the IoT Framework** 728  
Francesco P. Chietera (University of Salento, Italy); Riccardo Colella (National Research Council (CNR), Italy); Luca Catarinucci (University of Salento, Italy)

**Notes on the Extraction of Aspect-Independent Parameters of Chipless RFID Tags** 732  
Zeshan Ali (University of Grenoble Alpes, France & LCIS, Grenoble INP, France); Etienne Perret (Grenoble INP - LCIS, France)

**Online Admission of Hard Aperiodic Tasks in Real-Time Energy Harvesting Systems** 738  
Rola Osta (University of Nantes, France); Maryline Chetto (Universite de Nantes CNRS & LS2N Lab, France)

**A Modular System of Rectifiers for Energy Harvesting with Wide Dynamic Input-Range** 744  
Simone Trovarello, Giacomo Paolini and Diego Masotti (University of Bologna, Italy); Alessandra Costanzo (DEI, University of Bologna, Italy)

**2.4 GHz BLE-based Smart Sensing System for Remote Monitoring of Health, Safety and Comfort at Workplace** 748  
Riccardo Colella and Luigi Spedicato (University of Salento, Italy); Vincenzo Molinaro and Alberto Ranavolo (INAIL, Italy); Luigi Patrono (University of Salento, Italy); Carlo Giacomo Leo (Institute of Clinical Physiology, Italy); Maria Rosaria Tumolo (Institute for Research on Population and Social Policies, Italy); Saverio Sabina (Institute of Clinical Physiology, Italy); Luca Catarinucci (University of Salento, Italy)

**Wireless charging using NFC technology** 753  
Jeremy Quignon (IM2NP & STMicroelectronics, France); Anthony Tornambe (STMicroelectronics, France); Thibaut Deleruyelle (IM2NP & ISEN Toulon, France); Philippe Pannier (IM2NP, France)

## **SMART DISTRIBUTED ELECTRICAL NETWORK**

<b>Adaptive Protection Scheme for AC Microgrids: Simulations for Grid-Connected/Islanded Mode</b>	<b>757</b>
<i>Michela Longo (Politecnico di Milano, Italy); Morris Brenna (Politecnico di Milano – Department of Energy, Italy); Muhammad Azhar Hayat Khan (Politecnico di Milano, Italy)</i>	
<b>Effectiveness of Communication Topology Design on Rate of Convergence of the Reactive Power Sharing in off-grid Microgrids</b>	<b>763</b>
<i>Ahmed Sulaiman Alsafran (King Faisal University, Saudi Arabia &amp; College of Engineering, Saudi Arabia)</i>	
<b>Comparing Recurrent Neural Networks using Principal Component Analysis for Electrical Load Predictions</b>	<b>768</b>
<i>Nils Jakob Johannesen, Mohan Kolhe and Morten Goodwin (University of Agder, Norway)</i>	
<b>Short-Term Load Forecasting of building electricity consumption using NARX Neural Network model</b>	<b>774</b>
<i>Irati Zapirain (University of the Basque Country, Plaza de Europa 1 &amp; University Bordeaux, ESTIA Institute of Technology, Spain)</i>	

## **UNMANNED AERIAL SYSTEMS**

### **UNMANNED AERIAL SYSTEMS – AEROTECH AND AEROSPACE APPLICATIONS**

<b>Unmanned Aerial Vehicle Flight Risk Assessment Model for Environmental Research on Mountain Terrain</b>	<b>780</b>
<i>Volodymyr Polishchuk (Uzhgorod National University, Ukraine); Miroslav Kelemen and Martin Kelemen (Technical University of Košice, Slovakia); Andriy Polishchuk (Uzhgorod National University, Ukraine); Goran Gasparovic (UNIST-FESB, Croatia)</i>	
<b>Person localization and distance determination using the raycast method</b>	<b>785</b>
<i>Goran Paulin (Kreativni odjel D. O. O. Rijeka, Croatia); Sasa Sambolek (High School Tina Ujevica Kutina, Croatia); Marina Ivasic Kos (University of Rijeka, Croatia)</i>	

<b>REVIEWERS LIST</b>	<b>790</b>
-----------------------	------------

<b>AUTHOR INDEX</b>	<b>792</b>
---------------------	------------