

# **2016 International Multidisciplinary Conference on Computer and Energy Science (SpliTech 2016)**

**Split, Croatia  
13-15 July 2016**



**IEEE Catalog Number: CFP16F09-POD  
ISBN: 978-1-5090-1661-7**

**Copyright © 2016, FESB, University of Split  
All Rights Reserved**

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

IEEE Catalog Number:	CFP16F09-POD
ISBN (Print-On-Demand):	978-1-5090-1661-7
ISBN (Online):	978-953-290-063-7

**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 1

- Real-time monitoring of heart rate by processing of Microsoft Kinect™ 2.0 generated streams** 1  
*Ilaria Bosi, Chiara Coggerino and Marco Bazzani (ISMB - Istituto Superiore Mario Boella, Italy)*
- Cardiac Arrhythmia Detection Using DCT Based Compressive Sensing and Random Forest Algorithm** 7  
*Tea Marasović and Vladan Papić (FESB, University of Split, Croatia)*
- Number of EEG Signal Components Estimated Using the Short-Term Renyi Entropy** 13  
*Jonatan Lerga, Nicoletta Saulig, Vladimir Mozetic and Rebeka Lerga (University of Rijeka, Croatia)*

#### E-HEALTH 2

- Location-based Smartwatch Application for People with Complex Communication Needs** 19  
*Marin Vuković, Željka Car, Melita Fertalj, Ida Penezić, Valerija Miklaušić, Jasmina Ivšac, Nina Pavlin (University of Zagreb, Croatia) and Lidija Mandić (Vienna University of Technology, Austria)*
- 'Smartphine': Supporting Students' Well-Being According to Their Calendar and Mood** 26  
*Karolina Baras, Luísa Soares, Norberto Paulo and Regina Barros (University of Madeira, Portugal)*
- Health monitoring system for protecting elderly people** 33  
*Michal Frydrysiak and Lukasz Tesiorowski (Lodz University of Technology, Poland)*
- Integral Equation Models in Some Biomedical Applications of Electromagnetic Fields** 39  
*Dragan Poljak, Mario Cvetković, Vicko Dorić, Ivana Zulim, Zoran Đogaš, Maja Rogić Vidaković (University of Split, Croatia), Jens Haueisen (University of Ilmenau, Germany) and Khalil El Khamlichi Drissi (Pascal Institute, Université Clermont Auvergne Clermont-Ferrand, France)*

# SMART CITY/ENVIRONMENT

## SMART CITY/ENVIRONMENT 1

- A Web based Virtual Environment as a connection platform between people and IoT** 45  
*Marco Alessi, Enza Giangreco, Marco Pinnella, Stefano Pino, Davide Storelli (Engineering-Ingegneria informatica S.p.A., Italy), Luca Mainetti, Vincenzo Mighali and Luigi Patrono (University of Salento, Italy)*
- An Internet of Sport Architecture Based on Emerging Enabling Technologies** 51  
*Luca Mainetti, Luigi Patrono and Maria Laura Stefanizzi (University of Salento, Italy)*
- Online Platform for Case Studies in Smart Cities** 57  
*Sara Coelho (University of Minho, Portugal) and Nuno Vasco Lopes (University of Porto, Portugal)*
- WasteApp: Smarter Waste Recycling for Smart Citizens** 63  
*Dario Bonino, Maria Teresa Delgado Alizo, Claudio Pastrone and Maurizio Spirito (Istituto Superiore Mario Boella, Italy)*
- Model business process improvement by statistical analysis of the users' conduct in the process** 69  
*Almir Djedović, Emir Žunić (Info Studio Ltd, Bosnia and Herzegovina) and Almir Karabegović (University of Sarajevo, Bosnia and Herzegovina)*

## SMART CITY/ENVIRONMENT 2

- An IoT-aware AAL System for Elderly People** 75  
*Luca Mainetti, Luigi Patrono, Andrea Secco and Ilaria Sergi (University of Salento, Italy)*
- SDN-Based Security Framework for the IoT in Distributed Grid** 81  
*Carlos Gonzalez, Salim Mahamat Charfadine, Olivier Flauzac and Florent Nolot (University of Reims Champagne-Ardenne, France)*
- An embedded access control system for restricted areas in smart buildings** 86  
*Hyuri S. Maciel, Isadora Cardoso, David F. Silva, Clovis G. M. do Nascimento, Heitor S. Ramos (Federal University of Alagoas, Brazil), Joel J. P. C. Rodrigues (Universidade da Beira Interior, Portugal, National institute of Telecommunications, Brazil and University of Fortaleza, Brazil) and Andre L.L. Aquino (Federal University of Alagoas, Brazil)*
- Mapping aerial images from UAV** 92  
*Dunja Gotovac, Sven Gotovac and Vladan Papić (University of Split, Croatia)*

## SMART CITY/ENVIRONMENT 3

- Performance Evaluation of LOADng Routing Protocol in IoT P2P and MP2P Applications** 98  
*Jose V. V. Sobral (Universidade da Beira Interior, Portugal), Joel J. P. C. Rodrigues (Universidade da Beira Interior, Portugal, National Institute of Telecommunications, Brazil, King Saud University, Saudi Arabia), Kashif Saleem (King Saud University) and Jalal Al-Muhtadi (King Saud University, Saudi Arabia)*
- A Land Similarity Approach to Modeling Complex Ecological Networks** 104  
*Gianni Fenu and Pier Luigi Pau (University of Cagliari, Italy)*
- Using Mobile Crowd Sensing for Noise Monitoring in Smart Cities** 110  
*Marco Zappatore, Antonella Longo and Mario A. Bochicchio (University of Salento, Italy)*
- Cleaning up Smart Cities - Localization of Semi-Autonomous Floor Scrubber** 116  
*Višeslav Čelan, Ivo Stančić and Josip Musić (University of Split, Croatia)*

## ENERGY

### ENERGY 1

- S-MUnSTa: A Smart Ventilated Insulation System Based on IoT Protocol Stack** 122  
*Luigi Patrono, Piercosimo Rametta, Andrea Secco (University of Salento, Italy), Margherita Giampaoli, Vanessa Terlizzi and Placido Munafò (Polytechnic University of Marche, Italy)*
- Towards an ontology driven approach for systems interoperability and energy management in the smart city** 128  
*Paolo Brizzi, Dario Bonino (Istituto Superiore Mario Boella (ISMB), Italy), Alberto Musetti (D'Appolonia, Genova, Italy), Alexandr Krylovskiy (Fraunhofer FIT, Germany), Edoardo Patti (Politecnico di Torino, Italy) and Mathias Axling (CNet Svenska AB, Sweden)*
- A Framework for Thermal Building Parameter Identification and Simulation** 135  
*Sigmundo Preissler, Jr (Sapienza University of Rome, Italy and Federal University of Santa Catarina, Brazil)*

### ENERGY 2

- An improved multi-layer thermal model for photovoltaic modules** 140  
*Giuseppe Marco Tina and Antonio Gagliano (University of Catania, Italy)*
- Techno-economical analysis of replacing Diesel propulsion with hybrid electric-wind propulsion on ferries in the Adriatic** 146  
*Goran Gašparović (University of Zagreb) and Branko Klarin (University of Split, Croatia)*
- Energy Harvester for Remote Sensors Systems** 152  
*Leonardo Pantoli, Alfiero Leoni, Vincenzo Stornelli and Giuseppe Ferri (University of L'Aquila, Italy)*

**Energy Efficiency Combined SW Techniques on Mobiles Android OS** 155  
*Luan Ruçi (Universiteti Politeknik i Tiranës, Albania), Luan Karçanaj (Metropol University of Tirana, Albania) and Olimpjon Shurdi (Universiteti Politeknik i Tiranës, Albania)*

**A Service Oriented QoS Architecture Targeting the Smart Grid World & Machine Learning Aspects** 163  
*Christos Chrysoulas and Maria Fasli (University of Essex, United Kingdom)*

## **POSTER**

**A virtual instrument for efficient blind-source separation of nonstationary signals** 169  
*Željka Milanović, Nicoletta Saulig and Victor Sucic (University of Rijeka, Croatia)*

**Passive RFID Tag with Sensing and Reasoning Capabilities for Building Automation** 173  
*Riccardo Colella, Luca Catarinucci and Luciano Tarricone (University of Salento, Italy)*

**Evaluating the Suitability of Specific RFID Tags for IoT Applications Through a New Characterization Platform** 176  
*Riccardo Colella, Luca Catarinucci and Luciano Tarricone (University of Salento, Italy)*

## **INVITED PAPER**

### **INVITED PAPER (ENERGY)**

**A Review of Agent-based Modelling of Electricity Markets in Future Energy Eco-systems** 179  
*Jurica Babic and Vedran Podobnik (University of Zagreb, Croatia)*

### **INVITED PAPER (E-HEALTH)**

**Trends in Wireless Communications Towards 5G Networks – The Influence of E-health and IoT Applications** 188  
*Jose Marcos Camara Brito (National Institute of Telecommunications, Brazil)*