SpliTech 2016 - CONTENTS

1. GENERAL CHAIRS MESSAGE

Antonio Jara
*University of Applied Sciences
Western Switzerland (HEVS-
HES-SO) & HOP Ubiquitous
Switzerland*

Pascal Lorenz
*University of Haute Alsace
France*

Neven Duić
*University of Zagreb
Croatia*

Dear participants of SpliTech2016 conference,

we are pleased to announce the first edition of SpliTech conference, that will be held in University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB).

Becoming the first conference nowadays is a big challenge. However, looking at the conference program, we are proud with the outcome - the conference succeeded in combining the industry with academia, where sharing experiences in the hottest topics of today: e-Health, Smart City/Environment, and Energy is of great importance for building future, better world. The conference received total of 69 contributions, while 33 of them where accepted within the technical program, with acceptance rate of 48%, by following IEEE rules of acceptance rate and thus assuring the quality. Each paper was reviewed by at least three independent reviewers, and we use this opportunity to thank all reviewers and Technical Program Committee Members for tremendous efforts involved in the review process, while being strongly suggestive and thus helping Authors to improve their contributions.

We wish you a pleasant time in Split, at the host FESB, and successful SpliTech 2016!

Thank you for being a part of this, our new, bright event!

Best wishes,

Antonio Jara, Pascal Lorenz, Neven Duić

General Co-Chairs

GENERAL CHAIRS

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WEB CHAIR

Željka Milanović   University of Split, Croatia

Wednesday, July 13, 2016 (location: Split, FESB)

09.00 - 12.00 Registration

10.00 – 10.30 Coffee break

10.30 - 12.00 Technical program, Professional program

Lunch time

13.30 - 16.00 Registration

13.30 - 14.00 Invited talk

14.00 - 15.30 Technical program, Invited paper, Professional program

15.30 - 16.00 Coffee break

16.00 - 17.30 Tutorial

Thursday, July 14, 2016 (location: Split, FESB)

08.00 - 11.00 Registration

08.30 - 10.30 Technical program, IoT workshop

10.30 – 11.00 Coffee break

11.00 – 12.30 Opening ceremony, Plenary session

Lunch time

13.30 - 17.30 Registration

13.30 – 15.00 IoT workshop, Round tables: Energy, E-Health

15.00 - 15.30 Coffee break

15.30 - 18.00 Invited talk, Tutorial, Poster session, IoT exhibition session

18.30 Bus transfer to Split, Guided tour in Split

20.45 Conference dinner in "Vila Dalmacija"

Friday, July 15, 2016 (location: Split, FESB)

08.00 - 11.30 Registration

09.00 - 10.30 Technical program, Round table: Smart City

10.30 - 11.00 Coffee break

11.30 - 13.00 Invited paper, Invited talk, Professional program

Lunch time & Best paper award ceremony

Joel J.P.C. Rodrigues

Instituto de Telecomunicações, Universidade da Beira Interior, Covilhã, Portugal
Instituto Nacional de Telecomunicações (Inatel), Brazil
University of Fortaleza (UNIFOR), Ceará, Brazil

Challenges and Trends on Mobile Health Technologies

This keynote presentation will focus on a new hot topic on e-health technologies considering mobility environments and mobile technologies: Mobile Health. Information and communication technologies have rapidly grown in the few last decades along with mobile Internet concept of anywhere and anytime connectivity. In this context, Mobile Health (m-Health) proposes to deliver healthcare services, overcoming geographical, temporal and even organizational barriers. Pervasive and m-Health services aim to answer several emerging problems in health services, including, the increasing number of chronic diseases related to lifestyle, high costs in existing national health services, the need to empower patients and families to self-care and manage their own healthcare, and the need to provide direct access to health services, regardless of time and place. This keynote speech will address the most relevant contributions for healthcare and e-health systems, focusing on the mobile health revolution and evolution. The top and more used m-health applications in the mobile market and several ongoing works will be presented. Trends and insights on future research works are also considered.

Joel J.P.C. Rodrigues is a professor in the Department of Informatics of the University of Beira Interior, Covilhã, Portugal, and senior researcher at the Instituto de Telecomunicações, Portugal. He received the Academic Title of Aggregated Professor from the University of Beira Interior, the Habilitation in computer science and engineering from the University of Haute Alsace, France, a PhD degree in informatics engineering, an MSc degree from the University of Beira Interior, and a five-year BSc degree (licentiate) in informatics engineering from the University of Coimbra, Portugal. His main research interests include e-health, sensor networks, IoT, vehicular delay-tolerant networks, and mobile and ubiquitous computing. He is the leader of NetGNA Research Group (http://netgna.it.ubi.pt), the President of the scientific council at ParkUrbis – Covilhã Science and Technology Park, the Past-Chair of the IEEE ComSoc Technical Committee on eHealth, the Past-chair of the IEEE ComSoc Technical Committee on Communications Software, Steering Committee member of the IEEE Life Sciences Technical Community, Member Representative of the IEEE Communications Society on the IEEE Biometrics Council, and officer of the IEEE 1907.1 standard. He is the editor-in-chief of the International Journal on E-Health and Medical Communications, the editor-in-chief of the Recent Advances on Communications and Networking Technology, the editor-in-chief of the Journal of Multimedia Information Systems, and editorial board member of several journals. He has been general chair and TPC Chair of many international conferences, including IEEE ICC, GLOBECOM, and HEALTHCOM. He is a member of many international TPCs and participated in several international conferences organization. He has authored or coauthored over 450 papers in refereed international journals and conferences, two books, and 2 patents. He had been awarded several Outstanding Leadership and Outstanding Service Awards by IEEE Communications Society and several best papers awards. Prof. Rodrigues is a licensed professional engineer (as senior member), member of the Internet Society, an IARIA fellow, and a senior member ACM and IEEE.

Neven Duić

University of Zagreb, Croatia

Smart Energy Systems

Transition of energy systems to energy sources with lower environmental impact is becoming more attractive with fall of investment costs of renewables and volatile prices and political insecurity of fossil fuels. The resources are bountiful, especially wind and solar, while integrating them into current energy systems is proving to be a challenge. The limit of cheap and easy integration for wind is 20% of yearly electricity generation, while a combined wind and solar may reach 30%. Going any further asks for implementation of really free energy markets (involving day ahead, intraday and various reserve and ancillary services markets), and it involves integration between electricity, heat, water and transport systems. The cheapest and simplest way of increasing further the penetration of renewables is integrating power and heat systems through the use of district heating and cooling (which may be centrally controlled and may have significant heat storage capacity). In countries with low heat demand water supply system may be used to increase the penetration of renewables, by using water at higher potential energy as storage media, or in dry climates desalination and stored water may be used for those purposes, and reversible hydro may be used as balancing technology. Electrification of personal car transport allows not only for huge increase of energy efficiency, but also, electric cars due to low daily use may be excellent for demand side management and even storage potential. That will allow reaching 80% renewable in energy system, but the remaining 20% may be more an uphill battle without technology breakthrough. Long haul freight road transport, aviation and ship transport, as well as high temperature industrial processes, cannot currently be easily electrified. Biomass, if not used for producing electricity and heat, may cover half of those needs, but the rest will have to come from some other technology.

Neven Duić is a Professor in Energy Planning, Policy and Economics since 2001, Power Engineering and Energy Management Chair, Department of Energy, Power Engineering and Environment, Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb. He is member of International Scientific Committee of Dubrovnik Conference on Energy, Water and Environment Systems since 2003 and chair of its Local Organising Committee since 2007. He is co-Editor of Energy Conversion and Management, subject Editor of Energy, Editorial Board member of Applied Energy, member of regional editorial board of Thermal Science Journal and Editor-in-Chief of Journal of Sustainable Development of Energy, Water and Environment Systems. His research covers areas of energy planning of energy systems with high penetration of renewables, sustainable communities, energy policy, energy economics, mitigation of climate change, energy efficiency and combustion engineering.
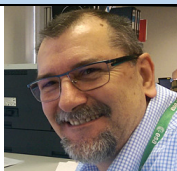
Davor Mance

ETH Zürich, Institute of Geophysics, Zürich, Switzerland

Check for a Spaceborne Gravitational Wave Detector

The Evolved Laser Interferometer Space Antenna (eLISA), previously called the Laser Interferometer Space Antenna (LISA), is a proposed European Space Agency (ESA) mission designed to detect and accurately measure gravitational waves – tiny ripples in the fabric of space-time. The tentative launch date for eLISA, according to ESA Cosmic Vision Program, is in 2034. A forerunner mission, LISA Pathfinder (LPF), was launched by ESA on December 3rd, 2015 to test several new technologies planned for eLISA. Precise LPF mechanics, propulsion, optics and electronics are all designed to demonstrate the geodesic freefall of the inertial sensor reference body needed for measurement of gravitational waves. This presentation starts with an introduction to the LPF spacecraft and its sub-systems, indicating their roles, design challenges and required performance. The rest of the presentation is then focused on technology verification of the Inertial Sensor Front End Electronics (IS FEE), which was designed in Switzerland under supervision of ETH Zürich. Being one of critical technologies on the spacecraft, its functionality and performance is presented in each step of LPF commissioning conducted in January and February 2016. The most critical operation was a release of two inertial sensor reference bodies (small gold – platinum cubes), which initiated the sensor drag-freefall check. Additional tests were conducted in the closed loop control from sensor via IS FEE and laser optical metrology to spacecraft propulsion, before a green light was given to start a science operations phase in March 1st, 2016. The science operations phase is planned for a duration of four months. The aim is to quantify and characterize all stray forces on inertial sensor reference bodies and compare these measurements with the theoretical calculations. The LPF and spacecraft design shall ensure that these stray forces remain negligible so that one of the sensor reference bodies remains in pure geodesic freefall. This means that the reference body has an unprecedented level of its residual acceleration needed to detect gravitational waves. The presentations end with key achievements and conclusions.

INVITED SPEAKER	Thursday, July 14
	08:45 - 09:10 (A102)

WORKSHOP ON IOT

Ivana Podnar Žarko

University of Zagreb, Croatia

Internet of Things Interoperability Challenges

In recent years the Internet of Things evolution has created a heterogeneous and fragmented platform landscape with an estimated number of M2M/IoT platforms ranging from 250 to 300 in mid-2016. The available platforms typically offer closed and domain-specific solutions integrating specific devices and gateways with cloud-based device management and data analytics services. Examples are smart city platforms, smart home solutions, platforms for agriculture and industrial internet. The emergent demand for cross-domain IoT applications fosters a new interoperability paradigm where IoT platforms need to be cooperative so as to provide a unified and secure access to their sensing/actuating resources to external parties. Moreover, interoperable platforms may collaborate and form platform federations in order to share or trade IoT resources with a goal to increase their market potential. The talk will highlight the main aspects of interoperability in the form of cooperation and collaboration, as well as different interoperability dimensions, namely technical, syntactical, semantical and organizational. A concrete example of semantic interoperability realized by the open-source OpenIoT platform will be detailed. Further on, the talk will introduce a cross domain approach of symbIoTe, a new H2020 RIA project which is a member of the IoT European Platforms Initiative. symbIoTe is proposing and designing an interoperability and mediation framework spanning over four domains: application, cloud, smart space and device domain. The application domain will provide a high-level abstraction layer for a unified

discovery and secure access to sensing/actuating IoT resources across cooperative platforms. IoT platform federations within the cloud domain will enable platforms to collaborate, while smart space and device domain will allow for flexible integration of smart infrastructure and roaming of smart devices. symbIoTe promotes a vision of future IoT landscape that will overcome market barriers to assure flexible platform interoperability for the benefit of SMEs and application developers.

Dr. Ivana Podnar Žarko is an Associate Professor at the University of Zagreb, Faculty of Electrical Engineering and Computing, Croatia, where she leads the Internet of Things Laboratory. She is the Technical Manager of the H2020 project symbIoTe: Symbiosis of smart objects across IoT environments, a member of the IoT European Platforms Initiative. She was leading the research group from the University of Zagreb that has contributed to the open-source OpenIoT platform. Her main research interests are on large-scale distributed systems, IoT, and Big data processing. She has co-authored more than 50 scientific journal and conference papers in these domains, and has served as a program committee member for a number of international conferences and workshops. She is a member of IEEE and was the Chapter Chair of IEEE Communications Society, Croatia Chapter (2011-2014).

INVITED SPEAKER	Thursday, July 14
	13:35 -14:00 (A102)

WORKSHOP ON IOT

Dejan Vukobratović

University of Novi Sad, Serbia

CONDENSE: A Reconfigurable Knowledge Acquisition Architecture for Future 5G IoT

In forthcoming years, the Internet of Things (IoT) will connect billions of smart devices generating and uploading a deluge of data to the cloud. If successfully extracted, the knowledge buried in the data can significantly improve the quality of life and foster economic growth. However, a critical bottleneck for realizing the efficient IoT is the pressure it puts on the existing communication infrastructures, requiring transfer of enormous data volumes. Aiming at addressing this problem, in this talk, we present a novel architecture called Condense, which integrates the IoT-communication infrastructure into data analysis. This is achieved via the generic concept of network function computation: Instead of merely transferring data from the IoT sources to the cloud, the communication infrastructure actively participates in the data analysis by carefully designed en-route processing. We define the Condense architecture, its basic layers, and the interactions among its constituent modules. Further, from the implementation side, this talk will describe how Condense can be integrated into the 3rd Generation Partnership Project (3GPP) Machine Type Communications (MTC) architecture, as well as the prospects of making it a practically viable technology in a short time frame, relying on Network Function Virtualization (NFV) and Software Defined Networking (SDN). Finally, from the theoretical side, we discuss the relevant literature on computing ``atomic'' functions in both analog and digital domains, as well as on function decomposition over networks, highlighting challenges, insights, and future directions for exploiting these techniques within practical 3GPP MTC architecture.

Dejan Vukobratović received the Dr.-Ing. degree in electrical engineering from the University of Novi Sad, Serbia, in 2008. Since 2009. he has been an Assistant Professor, and since 2014, an Associate Professor with the Department of Power, Electronics and Communication Engineering, University of Novi Sad. From June 2009 until December 2010, he was on leave as a Marie Curie Intra-European Fellow at the University of Strathclyde, Glasgow, U.K. From 2011 to 2014, his research was supported by the Marie Curie European Reintegration Grant. His research group participates in FP7 QoSTREAM and FP7 ADVANTAGE EU funded projects. He has co-authored over 70 research papers (more than 20 journal

papers) mostly published in top-tier IEEE journals and conferences. His research interests include sparse-graph codes, iterative decoding and network coding with applications in multimedia communications and wireless cellular networks.

<table>
<tr><td>INVITED SPEAKER</td><td>Thursday, July 14
15:30 -16:00 (Great Hall)</td></tr>
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WORKSHOP ON IOT

Giuseppe Marco Tina

University of Catania, Italy

Monitoring of photovoltaic/thermal (PV/T) Power Plants

There are many reasons to monitor solar installations, such as: following up on the energy yield, assessing the solar system performance and timely identifying design weaknesses and/or malfunctions. These needs for monitoring fall into three main groups:

- user feedback,

- performance verification,

- system evaluation/diagnostic.

As a matter of fact, a good monitoring system allows the energy professional to easily determine that a system is running properly, and gives access to information that will help troubleshoot a malfunctioning system. Consumers generally want to know the overall system production, along with cost savings or environmental benefit derived from that production. And nowadays, everyone wants that information in real time. Professionals need data pushed to them in the form of alerts to system malfunctions (via email or text message), along with remote access to real-time data that allow them to drill down to the performance of individual system components and sensors. An internet-accessible "dashboard" should permit the consumer to observe near real-time production and review the operating history. The monitoring system must flag clues to problems with the system. It becomes clear that to maximize effectiveness, advanced monitoring and more intelligent control should be brought together in one smart, connected device. An integrated control/monitoring system is the most powerful tool available to efficiently manage PV and solar thermal operations. Once the domain of expensive industrial supervisory control and data acquisition (SCADA) systems, these capabilities are now available in lower-cost, easy-to-use controllers. It has to be stressed the importance of real-time, live interaction with the PV and ST systems, with a complete and remotely accessible view of device status and history. From the monitoring point of view, a PVT plant can be viewed as two separate systems: a PV system and an ST thermal system. On this regard, performance measurements of PVT collectors need to be in agreement with IEC61215 for the electrical part and with EN12975-2 for the thermal part. Yet, the close energetic interactions need to be taken into account, especially concerning the procedures and conditions of measurements. After a general overview of the proposed topic, focusing on PVT systems is provided.

MS, Electrotechnics Engineering, 1988 University of Catania (UdC) Italy; Ph.D., Electrotechnics Engineering, 1992, UdC. Currently he is associate Professor of Electric Energy Systems at UdC. In 2013 he got the National Academic Qualification as Full Professor. In 1992 he was guest staff member in Newcastle University (U.K.). From 1993 to 1996 he worked in the industry with Agip Refineries and ST Microelectronics in Italy, as electrical engineer responsible for electrical facilities operation and maintenance. In 2002 he was associate researcher for INFN (National Institute for Nuclear Physics), sited in Catania, Italy. Responsible of Erasmus agreements: Universitè de Corse Pascal Paoli (France); University of Jules Verne (France); TEI of Western Greece (Greece); University of Jaén, Spain. Keynote

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speaker at 2012 IEEE EPE conference in Iasi Romania. Invited speaker at ICEEAC (Algeria, 2013), WREC (UK, 2014). Awarded in 2012 of the Diploma di Excelentia in teaching and research in power system from University "Stefan cel Mare", Suceava, Romania; best paper regular session in SEB 2014. From 2015 he is member of the Editorial Board of International Journal of Sustainable Energy. He is co-author in more than 180 scientific papers, published in International journals and conference proceedings, on the subject of electrical power systems and, in particular, on: Analysis and modelling of Wind and Photovoltaic generation systems, DGSs (Dispersed Generation Systems), Energy and Ancillary Services Market, Stationary applications of Hydrogen Technology, Photovoltaic/thermal (PV/T) systems, Monitoring and diagnostic of photovoltaic systems. He is responsible of power system research group at Udc. He is a Member of the IEEE Power and Energy Society. From 2010 to 2015 he was vice-president of the section of Catania of the Italian Federation of Electrotechnics, Electronics, Automation, Informatics and Telecommunications (AEIT).

INVITED SPEAKER	Friday, July 15
	11:30 -12:00 (Great Hall)

Agis M. Papadopoulos

Aristotle University Thessaloniki, Greece

Zero Energy Buildings in another background: Achieving energy efficiency in warm and humid climatic conditions

The implementation of energy efficiency measures as well as the integration of renewable energy systems, on the move towards the Zero (or Nearly Zero) Energy Building is certainly a challenging task. This is even more the case, when buildings are to operate in climaticconditions deviating from the typical Northern and Western European ones, especially with respect to the cooling demand, as it happens in the Mediterranean, the Middle East and North Africa or in Southeast Asia. Energy conscious architectural design is a pre-requisite, as well as the utilization of the building envelope's thermal properties. But even in the most successful passive buildings, the use of renewable energy systems, as an integral part of the building's design, is needed in order to achieve Zero energy status. Systems like active solar thermal and geothermal ones can provide the necessary heating and cooling, whilst building integrated PVs can cover the electrical loads, either in terms of consumption or of expenses. In any case, all those systemshave to be fitted smoothly into the thermodynamic profile of the building's envelope and operation, implying the use of advanced building automation and controls, as the optimum combination of all this "hardware" is rather difficult to achieve by using "traditional" controls. Finally, understanding the requirements of the user and providing adequate solutions remains the single most important prerequisite, if the design had to be successful and just a simple academic exercise. Those points will ne addressed within this paper, on the base of some successful examples of energy efficient buildings, with well integrated energy conservation and utilization systems, but also of some rather unsuccessful ones, as both cases can lead to useful conclusions.

Agis Papadopoulos was born in Thessaloniki, Greece. He spent part of his childhood in Aachen, Germany and graduated from the German Gymnasium of Thessaloniki (Deutsche Schule Thessaloniki). He completed his Diploma in Mechanical Engineering at the Aristotle University Thessaloniki, in 1989, and his Master of Science in Energy Conservation at the School of Mechanical Engineering, Cranfield University (UK), in 1990. He made his Doctorate in Mechanical Engineering, on the feasibility of solar thermal systems, at the Aristotle University Thessaloniki, in 1994. Between 1994 and 1998, he was lecturing at the Dept. of Mechanical Engineering, at the University of Thessaly, in Volos and at the Department of Business Administration, at the University of Macedonia, in Thessaloniki. In 1998, he was elected Assistant Professor on Energy Systems at the Department of Mechanical Engineering at the

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Aristotle University Thessaloniki. In 2004, he was elected Associate Professor. Since 2010, he is a full Professor on energy systems. His research and academic work are focused on the following topics:

1. *Energy conservation and rational use of energy in buildings, emphasising on energy design of buildings, thermal insulation and HVAC systems.*
2. *Energy and environmental economics, emphasising on the feasibility of energy investments and the development of incentives for the implementation of energy policies.*

He has been a board member of the Hellenic Regulatory Authority for Energy (2003-2005) and of the AHEPANS General Hospital of Thessaloniki (2005-2007), as well as a national expert to the CEC on Research and Innovation in the 6th FP, on Energy in the 7th FP and on the Ideas Programme in the 7th FP. Furthermore, he is a member of the Hellenic Technical Chamber (TEE) since 1989 and of the American Society of Heating Refrigeration Air Conditioning Engineering (ASHRAE) since 2003. When not in office, lecturing or participating in some conference or project meeting, he can be found at a depth of 30 to 40 m below the sea surface.

5.TECHNICAL PROGRAM

Wednesday, July 13
Wednesday, July 13, 10:30 - 12:00
S1: Smart City/Environment 1 (A103)
Chair: Riccardo Colella, University of Salento, Italy

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

S2: Energy 1 (A104)
Chair: Branko Klarin, University of Split, FESB, Croatia

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

Wednesday, July 13, 14:00 - 14:30
IP1: Invited paper (Energy) (A104)

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

Wednesday, July 13, 14:00 - 15:30
S3: Smart City/Environment 2 (A103)
Chair: Josip Musić, University of Split, FESB, Croatia

1. **An IoT-aware AAL System for Elderly People**
   Luca Mainetti, Luigi Patrono, Andrea Secco and Ilaria Sergi (University of Salento, Italy)

TIMETABLE

FESB, University of Split, Wednesday, July 13		
TIME/HALL	**A103**	**A104**	**A105**
09:00	REGISTRATION*		
10:00 - 10:30	Coffee Break		
10:30 - 12:00	**S1: Smart City 1**	**S2: Energy 1**	**P1: Professional 1**
12:00 - 13:30	Lunch		
13:30 - 14:00	**Invited talk (A102)** D. Mance (ETH Zurich, Switzerland), Technology Check for a Spaceborne Gravitational Wave Detector		
14:00 - 15:30	**S3: Smart City 2**	**Invited paper (Energy)** J. Babic, V. Podobnik (University of Zagreb, Croatia); "A Review of Agent-based Modelling of Electricity Markets in Future Energy Eco-Systems"	**P2: Professional 2**
15:30 - 16:00	Coffee Break		
16:00 – 17:30	**Tutorial (Great Hall):** A. Jara (Universiy of Applied Sciences Western Switzerland (HEVS-HES-SO) & HOP Ubiquitous, Switzerland), Making the IoT ready to be large scale deployed: device management and intelligence distribution		

FESB, University of Split, Thursday, July 14		
TIME/HALL	**Great Hall**	**A102**	**Small Hall**
08:30 - 10:30	**S4: E-Health 1**	**IoT Workshop 1** **Invited talk:** I. Podnar Zarko, (University of Zagreb, Croatia) STMicroelectronics, Impinj, Engineering, Exprivia	**S5: E-Health 2**
10:30 - 11:00	Coffee Break		
11:00 - 12:30	**OPENING CEREMONY**		
	Keynote speeches (A100): Joel Rodrigues (University of Beira Interior, Portugal), *Challenges and Trends on Mobile Health Technologies* Neven Duic (University of Zagreb, Croatia), *Smart Energy Systems*		

TIME/HALL	Great Hall	A102	Small Hall
12:30 - 13:30	Lunch		
13:30 - 15:00	Round Table: Energy renovation of Buildings in Croatia: Reaching EU Targets, Issues and upcoming Challenges	IoT Workshop 2 Invited Talk: Dejan Vukobratovic (University of Novi Sad, Serbia), FutureCitiesLab, GeoMobile, HAKOM	Round Table: e-Health in Croatia, Where are we and where we want to be?
15:00 - 15:30	Coffee Break		
15:30 - 18:00	Invited talk G. M. Tina (University of Catania, Italy), Monitoring of Photovoltaic/Thermal (PV/T) Power Plants	FACULTY ATRIUM	Tutorial: D. Poljak (University of Split, Croatia) et al., Various Aspects of Interaction of Humans with Electromagnetic Fields
		IoT Workshop: Exhibition	Poster Session	
18:30	Bus to the City Centre and Guided Tour of Split		
20:45	Conference Dinner in "Vila Dalmacija"		

FESB, University of Split, Friday, July 15			
TIME/HALL	A104	Great Hall	Small Hall
09:00 - 10:30	S6: Smart City 3	Round Table: Smart City: Concepts, Realization and Experiences	S7: Energy 2
10:30 - 11:00	Coffee Break		
11:30 - 13:00	Invited paper (e-Health), J. M. Brito (Intatel, Brasil): "Trends in Wireless Communications Towards 5G Networks - The Influence of E-health and IoT Applications"	Invited talk A. M. Papadopoulos (Aristotle University of Thessaloniki, Greece), Zero Energy Buildings in Another Background: Achieving energy Efficiency in Warm and Humid Climatic Conditions	P3: Professional 3
13:00	Lunch and Best Paper Award Ceremony		

*Registration: Wednesday (09:00 – 12:00, 13:00-16:00), Thursday (08:00 – 11:00, 13:30-18:00), Friday (08:30 – 11:00)

2. **SDN-Based Security Framework for the IoT in Distributed Grid**
   Carlos Gonzalez; Salim Mahamat Charfadine; Olivier Flauzac and Florent Nolot (University of Reims Champagne-Ardenne, CReSTIC/SYSCOM, France)
3. **An embedded access control system for restricted areas in smart buildings**
   Hyuri S. Maciel, Isadora Cardoso, David F. Silva , Clóvis G. M. do Nascimento and Heitor S. Ramos (Federal University of Alagoas, Brazil); Joel J. P. C. Rodrigues (Instituto de Telecomunicações, University of Beira Interior, Portugal); Andre L. L. Aquino (Federal University of Alagoas, Brazil)
4. **Mapping aerial images from UAV**
   Dunja Gotovac; Sven Gotovac; Vladan Papić (University of Split, Croatia)

Thursday, July 14

Thursday, July 14, 08:30 - 10:30

S4: E-Health 1 (Great Hall)

Chair: Snježana Mardešić, School of Medicine, University of Split, Croatia

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

Thursday, July 14, 08:30 - 10:30

S5: E-Health 2 (Small Hall)

Chair: Katarina Vukojević, School of Medicine, University of Split, Croatia

1. **Location-based Smartwatch Application for People with Complex Communication Needs**
   Marin Vuković; Željka Car, Melita Fertalj and Ida Penezić (University of Zagreb, Croatia); Valerija Miklaušić (Vienna University of Technology, Austria); Jasmina Ivšac, Nina Pavlin Bernardić and Lidija Mandić (University of Zagreb, Croatia)
2. **'Smartphine': Supporting Students' Well-Being According to Their Calendar and Mood**
   Karolina Baras, Luísa Soares, Norberto Paulo and Regina Barros (University of Madeira, Madeira-ITI, Portugal)
3. **Health monitoring system for protecting elderly people**
   Michal Frydrysiak and Lukasz Tesiorowski (Lodz University of Technology, Poland)

Thursday, July 14, 15:30 - 18:00

P: Poster Session (Faculty Atrium)

Chair: Toni Perković, University Department of Forensic Sciences, University of Split, Croatia

1. **A virtual instrument for efficient blind-source separation of nonstationary signals**
   Željka Milanović (University of Split); Nicoletta Saulig and Victor Sučić (University of Rijeka, Croatia)
2. **Passive RFID Tag with Sensing and Reasoning Capabilities for Building Automation**
   Riccardo Colella, Luca Catarinucci and Luciano Tarricone (University of Salento, Italy)
3. **Evaluating the Suitability of Specific RFID Tags for IoT Applications Through a New Characterization Platform**
   Riccardo Colella, Luca Catarinucci and Luciano Tarricone (University of Salento, Italy)

1. **Integral Equation Models in Some Biomedical Applications of Electromagnetic Fields; Transcranial magnetic stimulation (TMS), Nerve fiber stimulation**
   Dragan Poljak, Mario Cvetković, Vicko Doric, Ivana Zulim, Zoran Đogaš, and Maja Rogic (University of Split, Croatia); Jens Haueisen (Technical University Ilmenau, Germany); Khalil El Khamlichi Drissi (Universite Blaise Pascal & LASMEA Laboratory, France)

Friday, July 15
Friday, July 15, 09:00 - 10:30
S6: Smart City/Environment 3 (A104)
Chair: Luigi Patrono, University of Salento, Italy

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

S7: Energy 2 (Small Hall)
Chair: Agis M. Papadopoulos, Aristotle University Thessaloniki, Greece

1. **An improved multi-layer thermal model for photovoltaic modules**
   Giuseppe Marco Tina and Antonio Gagliano (University of Catania, Italy)
2. **Techno-economical analysis of replacing Diesel propulsion with hybrid electric-wind propulsion on ferries in the Adriatic**
   Goran Gašparović (University of Zagreb, Croatia); Branko Klarin (University of Split, Croatia)
3. **Energy Harvester for Remote Sensors Systems**
   Leonardo Pantoli; Alfiero Leoni, Vincenzo Stornelli and Giuseppe Ferri (University of L'Aquila, Italy)
4. **Energy Efficiency Combined SW Techniques on Mobiles Android OS**
   Luan Ruçi, Olimpjon Shurdi and Luan Karcanaj (Polytechnic University of Tirana, Albania)
5. **A Service Oriented QoS Architecture Targeting the Smart Grid World & Machine Learning Aspects**
   Christos Chrysoulas and Maria Fasli (Universit of Essex, United Kingdom)

Friday, July 15, 11:30 - 12:00
IP2: Invited paper (e-Health) (A104)

1. **Trends in Wireless Communications Towards 5G Networks - The Influence of E-health and IoT Applications**
   José Marcos Camara Brito (Inatel, Brazil)

6. PROFESSIONAL PROGRAM

Wednesday, July 13
Wednesday, July 13, 10:30 - 12:00
P1: Professional papers 1 (A105)
Chair: Vicko Dorić, University of Split, FESB, Croatia

1. **Design and Development of a Low-Cost Hen Eggs Incubator**
   Ante Palac; Ana Kuzmanić Skelin and Mirjana Bonković (University of Split, Croatia)
2. **Classification of driving style using car's on-board sensors and neural network**
   Matej Matišić and Josip Musić (University of Split, Croatia)
3. **Face and Nose Detection in Digital Images using Local Binary Patterns**
   Stanko Kružić and Vladan Papić (University of Split, Croatia)
4. **Performance comparison for NVIDIA CUDA and Intel Xeon Phi**
   Petra Lončar; Sven Gotovac and Vladan Papić (University of Split, Croatia)
5. **FPGA based digital image processing system for aerial search and rescue assistance**
   Ante Gotovac, Sven Gotovac, Vladan Papić (University of Split, Croatia)

Wednesday, July 13, 14:00 - 15:30
P2: Professional papers 2 (A105)
Chair: Giuseppe Marco Tina, University of Catania, Italy

1. **Information System for Monitoring Power Plant Production Indicators - Independent Development and Implementation in Croatian Electricity Company**
   Ivica Vukelić (Electricity Production & HEP Proizvodnja, Croatia)
2. **Retrofitting towards nZEB - A Cyprus case study for residential buildings**
   Flouris Xeni, Polyvios Elefthriou and Nikos Paraskeva (Cyprus University of Technology, Cyprus)
3. **Impact of the financial crisis to the penetration of broadband networks and services within EU**
   Spyros E. Polykalas (TEI of Ionian Islands, Greece); Kyriakos G. Vlachos (University of Patras, Greece)
4. **Services in tourism based on Vision 2020 - a chance for telecom operators**
   Sven Gotovac (University of Split, Croatia); Igor Jurčić and Ivan Radoš (HT Eronet, Bosnia and Herzegovina)

Friday, July 15, 11:30 - 13:00
P3: Professional papers 3 (Small Hall)
Chair: Tea Žakula, University of Zagreb, Croatia

1. **Operation of an electrolyzer in a stand alone renewable energy system**
   Jakov Šimunović and Frano Barbir (University of Split, Croatia)
2. **Surface Approximation using RBFs with L_1 Norm in Polynomial Form**
   Dario Ban and Stipe Perišić (University of Split, Croatia)
3. **Analysis of influence of panel size on PV panel operating temperature**
   Filip Grubišić Čabo; Ivo Marinić-Kragić and Sandro Nižetić (University of Split, FESB, Croatia); Agis M. Papadopoulos (Aristotle University of Thessaloniki, Greece)
4. **Power TAC: A Sustainable Smart Electricity Markets Simulator**
   Vedran Podobnik, Jurica Babic (University of Zagreb, Croatia), Wolfgang Ketter (RSM Erasmus University, The Netherlands), John Collins (University of Minnesota, USA), Mohammad Ansarin (RSM Erasmus University, The Netherlands)

TUTORIAL	Wednesday, July 13
	16:00-17:30 (Great Hall)

Antonio J. Jara

Universiy of Applied Sciences Western Switzerland (HEVS-HES-SO) & HOP Ubiquitous, Switzerland

Making the IoT ready to be large scale deployed: device management and intelligence distribution

The IoT is reaching the expected maturity in the market. The last years very important disruptions have happened around Internet connectivity with the introduction of 6LoWPAN, M2M, NB-IoT and Ultra Narrow Band for enabling a wide range of solutions that offer the bandwidth, coverage, costs and power consumption for every potential scenario. At the same time, IoT has been evolving our knowledge and conception of the world as an hyper-connected environment that has raised new requirements for making the IoT ready for large scale deployments. One of the design considerations, for the success of the IoT, has been to integrate scalable device management and also edge intelligence capabilities, in order to promote and ensure the interoperability, homogeneity, openness, security, flexibility, and heritage of all existing hardware, and tools. This work presents how to integrate the management protocols in IoT-based deployments with protocols such as OMA LwM2M for enabling remote maintenance, firmware upgrade, heterogeneous resources exposition etc., and also to deploy edge computing services that enhance scalability, quality of service and privacy. An overview and explanation of the new IoT capabilities that cover from connectivity, management to edge intelligence will be addressed.

Biography: *Antonio J. Jara; As. Prof. PostDoc at University of Applied Sciences Western Switzerland (HES-SO), vice-chair of the IEEE Communications Society Internet of Things Technical Committee, and founder of the Internet of Things startup HOP Ubiquitous S.L., He did his PhD (Cum Laude) at the Intelligent Systems and Telematics Research Group of the University of Murcia (UMU) from Spain in 2013. He received two M.S. (Hons. – valedictorian) degrees. Since 2007, he has been working on several projects related to IPv6, Security and WSNs in automation and healthcare. He is especially focused on the design and development of new protocols for security and mobility for Future Internet of things, which was the topic of his Ph.D. He did the transfer of the results from his PhD around Security in the American Company United Technologies (owner of OTIS, Carrier and several building automation and aerospace companies). Nowadays, he continues working on IPv6 technologies for the Internet of Things In areas such as security, heterogeneity integration and the application of IoT in sectors such as industry 4.0, energy, home automation and wearables. He has also carried out a Master in Business Administration (MBA). He has published over 100 international papers (1250 citations), As well he holds several patents in the IoT domain. Finally, he participates in several European Projects about Internet of Things (networking, security and intelligence distribution – fog computing) and applied Internet of Things (energy, industry 4.0 and wearables).*
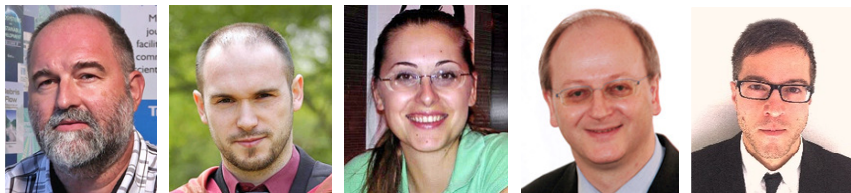
Dragan Poljak, Mario Cvetković, Maja Rogić Vidaković, Jens Haueisen and Valerio De Santis

Paper presentation:

1. **Integral Equation Models in Some Biomedical Applications of Electromagnetic Fields; Transcranial magnetic stimulation (TMS), Nerve fiber stimulation**
   Dragan Poljak, Mario Cvetković, Vicko Doric, Ivana Zulim, Zoran Đogaš, and Maja Rogic (University of Split, Croatia); Jens Haueisen (Technical University Ilmenau, Germany); Khalil El Khamlichi Drissi (Universite Blaise Pascal & LASMEA Laboratory, France)

The paper reviews certain integral equation formulations and related numerical solution methods used in studies of biomedical applications of electromagnetic fields related to transcranial magnetic stimulation (TMS) and nerve fiber stimulation. TMS is modeled via the set of coupled surface integral equations (SIEs), while the numerical solution of governing equations is undertaken via an efficient Method of Moments (MoM) scheme. A myelinated nerve fiber, stimulated by a current generator, is represented by a straight thin wire antenna. The model is based on the corresponding homogeneous Pocklington integro-diferential equation numerically solved via the Galerkin Bubnov Indirect Boundary Element Method (GB-IBEM). Some illustrative numerical results for the TMS induced fields and intracellular current distribution along the myelinated nerve fiber (active and passive), respectively, is obtained.

Human exposure to radiation from Electromagnetic Interference (EMI) sources

by Dragan Poljak, University of Split, Croatia

The scope of this part of the Tutorial is to give various aspects of human exposure to undesired electromagnetic radiation from artificial sources thus covering; basic ideas of electrosmog, coupling mechanisms between humans and electromagnetic fields, dosimetry methods, international/national safety guidelines, relevant exposure limits and safety measures. First, some theoretical and experimental techniques of incident field dosimetry for the determination of external fields due to power lines, transformer substations, radio base station antennas and mobile phones are analyzed. Furthermore, the presentation aims to review some electromagnetic-thermal dosimetry methods for the assessment of human exposure to low frequency (LF) and high frequency (HF) non-ionizing electromagnetic fields. In particular, the analysis approaches are based on certain integral/differential equation formulations and related numerical solution procedures (based on the use of Boundary Element Method – BEM, and Finite Element method – FEM) for the calculation of induced current densities and fields, specific absorption rate (SAR) and related temperature increase in a tissue. Illustrative computational examples pertaining to some realistic exposure scenarios, such as; pregnant woman/foetus exposed to low frequency (LF) fields, the human eye and the human brain exposed to HF electromagnetic fields will be given. Also, some numerical results for the nerve fiber stimulation will be presented as an example of biomedical application of electromagnetic fields. The obtained numerical results for induced current densities, internal fields and SAR are compared against exposure limits proposed by ICNIRP (International Commission on Non Ionizing Radiation Protection).

Biomedical application of EMF: Transcranial Magnetic Stimulation from two perspectives

by Mario Cvetković and Maja Rogić Vidaković, University of Split, Croatia

1. Engineering/Numerical Analysis point of view
2. Medical/Neuroscience point of view

Along the adverse effects due to unwanted exposure scenarios, the electromagnetic fields (EMF) are nowadays also applied to various therapeutic and diagnostic purposes. At the moment, one of a very interesting biomedical application of EMF is a technique known as transcranial magnetic stimulation (TMS), a noninvasive and generally painless way for achieving excitation or inhibition of cortical brain areas. TMS is used in various fields such as neurology, neurosurgery, neurophysiology, neuroscience and psychiatry. Navigated transcranial magnetic stimulation (nTMS) is today a standard technique in preoperative mapping of primary motor cortices in patients undergoing awake brain surgery. Also, great emphasis is now placed on development of neurophysiologic nTMS methodologies for mapping higher cognitive functions like speech and language. The TMS technique involves specifically designed coils positioned on the subject's/patients scalp that, when energized by a short but intense current pulse,generates a changing magnetic field which penetrates through the skull and scalp and in turn induced electric field in the brain within several centimeters of outer cortex. If the value of electric field reaches a threshold value, it causes activation within specific region.Although the variable efficiency of TMS stimulation can be primarily attributed to differences in relevant TMS settings such as coil positioning, pulse waveform, frequency, number of stimuli and the intensity of stimulation, the obvious difference in brain size between the individuals, as well as the biological tissue parameters such as permittivity and the electrical conductivity needs to be taken into account, since these parameters may affect the distribution of the induced electric fields in the brain. TMS modelling can aid in determining the exact location of stimulation, in the interpretation of experimental results and in designing more efficient stimulation setups. Numerical model of a TMS can provide TMS investigator with a more reliable prediction of the induced fields and currents. The presentation will give two complementary views of a TMS: the one from the side of a medical expert/researcher using nTMS in preoperative evaluation of patients undergoing neurosurgical operation, development of nTMS methodologies for mapping higher brain functions, and studying neurophysiologic mechanisms of speech and language generation and disorders. The second presentation will be given from a perspective of numerical analyst/engineer working on the development of a rigorous, and hence more exact simulation models for TMS. The results from both sides of TMS usage work will be presented in addition to some insights on future development.

New sensors and modeling approaches for Electroencephalography

by Jens Haueisen, Institute of Biomedical Engineering and Informatics, Technical University Ilmenau

Multichannel Electroencephalography (EEG) and Magnetoencephalography (MEG) are widely used in clinical neurology and neuroscientific research. EEG caps with wet Silver/Silver-Chloride (Ag/AgCl) electrodes represent an often-used standard in the field. Reproducible electrode-skin contact for these electrodes is ensured by electrolyte gel or paste. Thus, these electrodes require specific mechanisms to apply and hold the gel at the electrode positions in the caps and require skilled personnel to apply the EEG cap. Dry electrodes allow more degrees of freedom in the design and fabrication of EEG caps and can be self-applied without long preparation times. This talk will present novel multi-channel EEG caps with dry electrodes. The base material of the EEG cap is a light-weight and flexible fabric, which contains small holes (perforation) making it breathable. Polyurethane (PU) based multi-pin electrodes serve as novel dry contact electrodes. A coating provides electrical conductivity of these polymer based electrodes. The use of silver coating opens the way for dry AgCl electrodes and thus, signal quality similar to wet Ag/AgCl electrodes. Our results demonstrate that resting state EEG, eye movements, alpha activity, and pattern reversal VEP can be recorded with a novel dry multi-channel EEG cap without long preparation times and without significant differences between the novel EEG cap and a conventional cap based on wet Ag/AgCl electrodes. In the second part of the talk, source reconstruction based on the EEG data will be addressed. In order to reconstruct the neuronal activity underlying measured EEG data both the forward problem (computing the electromagnetic field due to given sources) and the inverse

problem (finding the best fitting sources to explain given data) have to be solved. The forward problem involves a source model and a model with the conductivities of the head. The conductivity model can be as simple as a homogeneously conducting sphere or as complex as a finite element model consisting of millions of elements, each with a different anisotropic conductivity tensor. The question is addressed how complex the employed forward model should be, and, more specifically, the influence of anisotropic volume conduction and the influence of conductivity inhomogeneities are evaluated. Moreover, validation of forward computations using high-resolution finite element method (FEM) modelling is presented. For this purpose, high resolution FEM models of the rabbit and the human head are employed in combination with individual conductivity tensors to quantify the influence of white matter anisotropy on the solution of the forward and inverse problem in EEG and MEG. Although the current state of the art in the analysis of this influence of brain tissue anisotropy on source reconstruction does not yet allow a final conclusion, the results available indicate that the expected average source localization error due to anisotropic white matter conductivity might be within the principal accuracy limits of current inverse procedures. However, in some percent of the cases a considerably larger localization error might occur. In contrast, dipole orientation and dipole strength estimation are influenced significantly by anisotropy. In conclusion, we introduce a novel type of sensor for EEG and demonstrate a validation of state of the art FEM modelling for EEG/MEG source reconstruction procedures and a source localization accuracy in the sub-millimeter range. FEM models can improve EEG/MEG based localization of neuronal activity.

Human Body Models for Numerical Dosimetry and Biomedical Applications

by Valerio De Santis

Numerical simulations are increasingly used to investigate both the impact of external electromagnetic fields on the human body and for medical applications, thereby complementing experimental studies. In the long term, the significance of numerical evaluations performed with computational human models can be expected to outweigh experimental studies. In this tutorial, an overview of human body models specifically developed for numerical dosimetry and biomedical applications will be envisaged. After a brief historical overview, the comparison between voxel-based models coming from MRI or CT image scans versus more complex CAD models will be presented. Automated vs. semi-automated segmentation procedures to develop these models will also be addressed. Finally, basic concepts on how to assign the right material properties to the several biological tissues will be undertaken.

Biography: *Dragan Poljak was born on 10 October 1965. He received his BSc in 1990, his MSc in 1994 and PhD in electrical engineering in 1996 from the University of Split, Croatia. He is the Full Professor at Department of Electronics, Faculty of electrical engineering, mechanical engineering and naval architecture at the University of Split, and he is also Adjunct Professor at Wessex Institute of Technology. His research interests include frequency and time domain computational methods in electromagnetics, particularly in the numerical modelling of wire antenna structures, and numerical modelling applied to environmental aspects of electromagnetic fields. To date professor Poljak has published nearly 200 journal and conference papers in the area of computational electromagnetics, seven authored books and one edited book, by WIT Press, Southampton-Boston., and one book by Wiley, New Jersey. Professor Poljak is a member of IEEE, a member of the Editorial Board of the journal Engineering Analysis with Boundary Elements, and co-chairman of many WIT International Conferences. He is also editor of the WIT Press Series Advances in Electrical Engineering and Electromagnetics. In June 2004, professor Poljak was awarded by the National Prize for Science. In 2013 he was awarded by the Nikola Tesla Prize for achievements in Technical Sciences. From 2011 to 2015 professor Poljak was the Vice-dean for research at the Faculty of electrical engineering, mechanical engineering and naval architecture. In 2011 professor Poljak became a member of WIT Bord of Directors. In June 2013 professor Poljak became a member of the board of the Croatian Science Foundation.*

Biography: *Mario Cvetković was born in Split, on October 30th 1981. He received the B.S. degree in electrical engineering from the University of Split, Croatia in 2005. In 2009 he obtained master degree in environmental electromagnetic compatibility from the Wessex Institute of Technology, University of Wales, United Kingdom, and in December 2013 he received Ph.D. from University of Split, Croatia, for the thesis entitled "Method for Electromagnetic Thermal Dosimetry of the Human Brain Exposed to High Frequency Fields". In December 2010, he held a seminar to graduate and postgraduate students at the*

Technical University of Ilmenau, Germany, and in September 2014 he held a seminar at the Mälardalen University, Västerås, Sweden. To date he has published 28 journal and conference papers and two book chapters. He is currently working as a postdoc at the Faculty of electrical engineering, mechanical engineering and naval architecture (FESB), University of Split. His research interests are numerical modeling including finite element and moment methods, computational bioelectromagnetics and heat transfer related phenomena. He is a recipient of the "Best Student Paper Award", awarded at the 16th edition of the international conference SoftCOM 2008. Also, in 2012, at the Scientific Novices Seminar held at FESB, he was awarded with the recognition for his previous scientific achievements.

Biography: *Maja Rogić Vidaković was born on 23 December 1982. She received her BA in speech and language pathology in 2005 by Faculty of Special Education and Rehabilitation, Department of Speech and Language Pathology, University of Zagreb, Croatia. She received her MSc in 2008 in neuroscience from Graduate School of Neural & Behavioural Sciences, International Max Planck Research School, Eberhard Karly University, Tübingen, Germany. In 2012 she received her PhD in neuroscience from School of Medicine, University of Split under the mentorship of Professor Vedran Deletis. She is a senior research assistant and research associate at the Department of Neuroscience, School of Medicine, University of Split, Croatia. From 2013 she is the Head of the Laboratory for Human and Experimental Neurophysiology (LAHEN) at the Department of Neuroscience. Her research interests are preoperative mappings of higher cognitive functions (particularly speech and language) with special expertise in nTMS, with future desire to apply the reserch achievements for intraoperative mappings of patients in Croatia. To date dr. Rogić Vidaković published totaly 26 works: 13 scientific publications (9 in Current Contents), 13 conference papers, she has been invited speaker to 4 international conferences. The number of citations was more than 60 in 2015 and ΣIF 30.669 (2014 year, 17). She is a member of Croatian Neuroscience Society, Croatian Society for EEG and Clinical Neurophysiology, Croatian Logopedic Association. She received Rector's award from the University of Zagreb, and 1 st award for best scientific poster for 2015 and 2012 at the International symposium on Navigated Brain Stimulation in Neurosurgery in Berlin, Germany.*

Biography: *Jens Haueisen received a M.S. and a Ph.D. in electrical engineering from the Technical University Ilmenau, Germany, in 1992 and 1996, respectively. From 1996 to 1998 he worked as a Post-Doc and from 1998 to 2005 as the head of the Biomagnetic Center, Friedrich-Schiller-University, Jena, Germany. In 2003 he received the habilitation (professorial thesis). Since 2005 he is Professor of Biomedical Engineering and directs the Institute of Biomedical Engineering and Informatics at the Technical University Ilmenau, Germany. He has authored and co-authored more than 200 research articles in peer reviewed scientific journals and serves on two editorial boards. From 2002 to 2004 he served as President and from 2004 to 2006 as Secretary General of the International Advisory Board on Biomagnetism. Since 2005, he is chair of the study program development commission and chair of the examination commission of the Bachelor and Master program "Biomedical Engineering". He is member of the academic senate of the Technical University Ilmenau and full member of the Saxon Academy of Science.*
His research interests include the investigation of active and passive bioelectric and biomagnetic phenomena and medical technology for ophthalmology.

Biography: *Valerio De Santis was born in L'Aquila, Italy, on August 23, 1982. He received the Bs.C, Ms.C, and Ph.D. degrees in electrical and computer engineering from University of L'Aquila, Italy, in 2004, 2006, and 2010, respectively. He was an external collaborator with the Department of Surgical Science of L'Aquila and the Italian Environment Ministry from February to November 2005 concerning an epidemiologic study related to the exposure of electromagnetic fields and melanoma of the uvea. He was a visiting researcher at the Motorola Corporate EME Research Laboratories, Plantation, FL, from June to September 2007, at the Philips Applied Technologies, Eindhoven, The Netherlands, from May to July 2008, and at the University of Calgary, Alberta, Canada, from May to July 2010.*
In April 2011, he joined the IT'IS Foundation where he was working on various dosimetry projects and computational electromagnetics. He was with the Department of Electrical and Computer Engineering, Nagoya Institute of TEchnology, Japan, as an Assistant Professor. He is now a Fellow Researcher at the Department of Industrial and Information Engineering and Economics, University of L'Aquila, Italy

ROUND TABLE

Thursday, July 14
13:30-15:00 (Small Hall)

Andrea Budin

Ericsson Nikola Tesla

e-Health in Croatia: Where are we, and where we want to be?

This Round Table discussion will gather physicians familiar with e-Health services to hear their opinion on the quality and needs of available e-Health services that they are using while defining necessities/requirements for the future:

1. What kind of e-Health services are used in their everyday work?
2. Are they satisfied with the performance of the used e-Health services?
3. Are there any improvements they want to add to the existing services?
4. Is there any new service/device necessity that could further facilitate their work?
5. What do they expect from e-Health services in the future?

Private sector companies (Ericsson, Exprivia) will discuss the requirements physicians have provided to solve the issues by their existing services or experiences they had acquired elsewhere, while academia will bring the insights about the moving trends and future of the e-Health.

Special invitation will be sent to the Croatian Ministry of health, to discuss the requirements and potential investments that are to come in e-Health sector.

Biography: *Andrea Budin, Ericsson Nikola Tesla, ICT for Industry & Society Andrea Budin received her BSc and MSc degrees in Computer Science at the Faculty of Electrical Engineering and Computing, University of Zagreb and her MBA degree at the Zagreb School of Economics and Management. After nine years of working as a research engineer and teaching assistant at the Faculty of Electrical Engineering and Computing, University of Zagreb, she joined Ericsson Nikola Tesla in 2000. During the first couple of years at the company she was the innovation manager within the company's research and development unit, followed by a line management role within the same unit. For the last decade she has been mostly involved in marketing, sales and business management activities, in the recent years primarily in the e-health area. She has since 2005 been a lecturer at the Zagreb School of Economics and Management, delivering courses on operations management. She is one of the longstanding conference chairs within the annual International Convention on Information and Communication Technologies MIPRO and a member of its International Program Committee.*

ROUND TABLE

Thursday, July 14
13:30-15:00 (Great Hall)

Tea Žakula

University of Zagreb

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Energy renovation of buildings in Croatia: Reaching EU targets, issues and upcoming challenges!

It is well known that buildings are responsible for large share of the primary energy consumption as well as also harmful carbon dioxide emissions. Current EU legislative related to the NZEB building has set high goals that need to be achieved only in the smooth cooperation between research institutions, professionals, financial institutions, governmental institutions and in general with all professions that are involved in the energy renovation programs. Consensus is needed more than ever and there are a lot of open questions and issues that need to be discussed in the professional environment to set directions and approach that finally will lead to successful renovation of the buildings in Croatia. Therefore, planned workshop within Splitech-2016 is crucial and important one to discuss all issues and problems related to the current and future issues related to the energy renovation of the buildings that will be organised in the professional international environment.

ROUND TABLE	Friday, July 15
	09:00 -10:30 (Great Hall)

Toni Perković

University of Split, Croatia

Smart City: Concepts, Realization and Experiences

Every city presents a unique system in which various actors from the city government to public utility companies and citizens are taking numbers of activities, thus creating a complex of interactions and interdependencies. Taking into account the priority activities of the city, as well as the environmental and social context including history and their specific characteristics, there is a need to establish a methodology that would help us finding a path towards smart and sustainable city.

The creation of smart and sustainable city does not present a purely technological process that usually promotes industrial sector throughout the implementation of i.e., smart lighting, in fact it is a complex process of business transformation and adaptation of large number of stakeholders involved in the development of urban and regional strategies. Thus, the model would include not only the city government and county, but also the presence of local universities, research centers, trade associations, public agencies, civil associations and local economy. Understanding the city as an open ecosystem, in which the promotion of mutual cooperation, accelerators, technology incubators and urban laboratories would enable the improvement of collective intelligence that would strengthen the creative energy of the city.

Therefore, within the context of SmartCity roundtable to be held during SpliTech conference, we invite stakeholders of the city, the county, the local economy and regulatory bodies to give their opinion on the development and sustainability of smart sustainable city. Throughout the discussion of current situation of the ICT maturity the stakeholders should define all what is necessary to achieve the vision of smart and sustainable city. Stakeholders should also provide answers to specific questions: What is the future smart city? What are the general objectives of the initiative and what is the main idea to achieve the specific objectives?

Biography: *Toni Perković is currently employed as Assistant professor at University Department for Forensic Sciences, University of Split, Croatia. He received the Dipl. Ing. degree in telecommunications and electrical engineering from the University of Split, Croatia, in 2007, and the PhD degree in Computer Science from the University of Split, Croatia, in 2013. His research interests include the location privacy, security and privacy in Internet of Things, the usability, design and analysis of security protocols for wireless (sensor) networks, the usability and design of the secure authentication protocols.*

9. WORKSHOP ON INDUSTRY OF INTERNET OF THINGS

- experience, challenges and evolution –

8:00h	Registration
8:30h	Welcoming message from the Workshop Chair
8:45h	Invited talk: **Ivana Podnar Zarko** (University of Zagreb, Croatia)
09:10h	Presentation 1: **STMicroelectronics**

STMicroelectronics is one of the world's largest semiconductor companies with net revenues of US$ 7.40 billion in 2014. Offering one of the industry's broadest product portfolios, ST serves customers across the spectrum of electronics applications with innovative semiconductor solutions by leveraging its vast array of technologies, design expertise and combination of intellectual property portfolio, strategic partnerships and manufacturing strength. ST focuses its product strategy on sense and power technologies, automotive products, and embedded-processing solutions and is among the world leaders in a broad range of segments. The Sense and Power segment encompasses MEMS and sensors, power discrete, and advanced analog products. The Embedded Processing Solutions include microcontrollers, digital consumer and imaging products, and digital ASICs. ST products are found everywhere microelectronics make a positive and innovative contribution to people's lives: from energy management and savings to trust and data security, from healthcare and wellness to smart consumer devices, in the home, car and office, at work and at play. Since its creation, ST has maintained an unwavering commitment to R&D and has established a strong culture of partnership and through the years has created a worldwide network of strategic alliances with key customers, suppliers, competitors, and leading universities and research institutes around the world.   www.st.com

09:30h	Presentation 2: **Impinj**

Impinj is a leading provider of RAIN RFID solutions. Impinj delivers Item Intelligence, physical items' unique identity, location and authenticity, to the digital world, which the company believes is the essence of the Internet of Things. Its platform connects billions of everyday items such as apparel, medical supplies, automobile parts, drivers' licenses, food and luggage to applications such as inventory management, patient safety, asset tracking and item authentication, delivering real-time information to businesses about items they create, manage, transport and sell.   www.impinj.com

09:50h	Presentation 3: **Engineering**

Engineering was founded in 1980, and it is currently the first IT group in Italy, with over 7.800 employees and 40 branch offices in Italy, Belgium, Serbia, Norvegia, Latin America and USA, a consolidated revenue portfolio in 2014 of about 853 million Euros. The group provides IT innovation to more than 1.000 large clients, with a complete offer combining system integration and application maintenence, outsourcing, cloud services and consulting, by operating in 4 main markets: Public Administration and Healthcare, Telco & Utilities, Industry and Services, Finance. The R&D Unit of Engineering, and in particular the Open Public Service Innovation (OPSI) Unit, develops research and innovation activities regarding the IoT and its relationship with social innovation processes. The IoT is a powerful means to provide context and insights about opportunities and challenges in the urban spaces. It can be leveraged to trigger ubiquitous services and to increase awareness in the individual, in the social, and in the environmental realm. OPSI is currently exploring multi-device service experiences and new approaches to enable a decentralized IoT, in which smart objects interact in a trustless and inter-ecosystem space. www.eng.it

10:10h	Presentation 4: **Exprivia**

Exprivia S.p.A. is a company specialised in the design and development of innovative software technologies and in supplying IT services for the banking,

financial institution, industry, energy, telecommunications, utilities, healthcare and public administration markets. The company today is listed on the Borsa Italiana MTA, Star segment (XPR), and it is subject to the direction and coordination of Abaco Innovation S.p.A.. Exprivia has a team of more than 1800 individuals, located in its headquarters in Molfetta (Bari) and throughout its offices in Italy (Trento, Vicenza, Milan, Piacenza, Genoa, Rome and Palermo) and abroad (Madrid, Las Palmas, New York, Dover, Mexico D.F., Monterrey, Guatemala City, Lima, São Paulo do Brasil, Rio de Janeiro São Bernardo do Campo, Beijing, Shanghai, Suzhou and Hong Kong).   www.exprivia.it

10:30h	Coffee break
11:00h	Opening Ceremony and Keynote Speeches
12:30h	Lunch
13:35h	Invited talk: **Dejan Vukobratovic** (University of Novi Sad, Serbia)
14:00h	Presentation 5: **Futurecitieslab**

 Future Cities Lab is a design-oriented environment focused on utilising digital media platforms, transmedia strategies and serious games to generate deep insight into the relationship between human factors and smart urban spaces. The Lab is focused on human-centred design for the future city, and collaborates widely with academic, industry and government bodies. The goals of the lab are three-fold: to develop evidence-based models to drive the re/design of environments, applications and devices; to effect positive behavioural change across structural domains (e.g. energy, transport), and inter/intrapersonal domains (e.g. health, safety and security); and to align human actions with the objectives of a sustainability framework.

The objectives of the Lab are to create a suite of social technologies to both model and crowdsource the future city. The activities of the Lab include research and publishing, consultancy and product development. The Lab employs digital media to research, disrupt and reorient behaviours in order to educate; generate change in, and alter patterns of, consumer decision-making and action; and enhance individual and community health and well-being. One such example of this work is the City4Age Project – a multinational, multidisciplinary consortium of companies, academic bodies and other organisations who are working together to define a new model to enable and create age-friendly cities, providing urban communities of elderly and at-risk people living in Smart Cities with a range of tools and services that unobtrusively aid in the early detection of risks related to cognitive impairments such as MCI and frailty while at home or moving about the urban landscape.   www.futurecitieslab.com

14:20h	Presentation 6: **GeoMobile**

 Participating in large-scale European and national research projects and combining cutting-edge technology expertise with commercial acumen, GeoMobile exploits innovative research and development into leading products, services and technology. Trusted by government and industrial customers, GeoMobile implements bespoke system solutions for various mobile platforms based on different outdoor and indoor positioning systems with a special focus on usability and accessibility. Software development at GeoMobile is happening in an agile environment with deep product owner participation. GeoMobile is an internationally recognized research and development partner for mobile apps and we deliver cutting-edge mobile system solutions. With ivanto GeoMobile offers a commercial solution for public transport providers. ivanto redefines accessibility in public transport, turning vehicles and station buildings into smart objects that are accessible for human interaction and that support users' activities – the Internet of Things for urban mobility. The requirements of the visually impaired and people with reduced mobility are regarded the highest standard in terms of usability and accessibility. ivanto provides accessible mobility assistance not only for people with special needs, but for all passengers. ivanto improves passenger information, increases the feeling of security and offers innovative mobility services.   www.geomobile.de

14:40h	Presentation 7: **HAKOM, Mario Weber,**

Internet of Things (IoT) is representing a network of mutually connected devices for everyday use, that have a capability of sending and receiving information about device state using the IP protocol. According to all statistical indicators, there is a significant growth in the number of connected devices which gives the possibility of developing advanced services by using the data from such networks. Applications in IoT are numerous, from the applications giving its user the additional value, to the scientific branches allowing simpler resource sharing. IoT success largely depends on standards and rules which need to be defined from the regulatory body. Without defined standards, interfaces, and protocols, full IoT expansion will be hardly possible. Besides that, defining the right balance of regulatory measures in the specific moment represents a great challenge. Hard regulation at the beginning can suppress IoT evolution, while at the same time the absence of regulatory measures does not give any legal safety to firms which can lead to a decrease in IoT initiatives.   www.hakom.hr

SofThings s.r.l. is a spin-off company of the University of Salento born from the desire of a group of professionals to convert their scientific results into commercial services. SofThings is composed of highly qualified engineers and researchers targeting technological excellence to overcome the constraints and limits of existing solutions. The innovative solutions developed by SofThings come from the research performed within the IDALab (IDentification Automation Laboratory, Department of Innovation Engineering, University of Salento). The mission of SofThings is developing an innovative middleware able to provide services based on Cloud and "Internet of Things" enabling technologies. The designed services cover heterogeneous application scenarios, such as healthcare, pharmaceutical, agrofood, smart mobility, tourism and Smart Cities.   http://www.softhings.com/en/

15:00h	Conclusions and Description of industry exhibition session
16:30h	Meeting corners & exhibition session in cooperation with: STMicroelectronics, Impinj, Engineering, Exprivia, GeoMobile, Future Cities Lab, SofThings