



INTERNET OF THINGS RESEARCH AND APPLICATIONS PROGRAM



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Internet of Things: Research and Applications
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1. CHAIRS MESSAGE



Luigi Patrono
University of Salento
Italy



Petar Šolić
University of Split
Croatia

Dear participants,

It is our pleasure to welcome you Internet of Things: Research and Applications Workshop. Multidisciplinary approaches are needed more than ever as well as close cooperation between the industry and academia to be able to solve key issues of the population and its survival. We are proud that we had the opportunity to take important role as general chairs and to ensure quality workshop program with popular topics related to RFID and Internet of Things. RFID is one of the technologies mostly enabling the Internet of Things, supporting plenty of multidisciplinary applications and attracting a rapid growing number of both industry and academic researchers. The main goal of this workshop is to present and discuss recent advances in the area of Radiofrequency Identification, Internet of Things and Embedded systems that are becoming research topics more and more interesting for both academia and industry. This workshop will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area.

Internet of Things: Research and Applications Workshop will be held in the historical city of Split (Croatia, EU) at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB), University of Split. Therefore, we wish to welcome you to the beautiful city of Split and we are sure that you will enjoy your time during the conference!

2. FINAL PROGRAM OUTLINE

Wednesday, June 27, 2018 (location: Split, FESB)

13:30 – 15:00 IoT1: Internet of Things – Hardware and Systems

15:00 – 15:30 Coffee Break

15:30 – 17:00 IoT: RFID

Thursday, June 28, 2018 (location: Split, FESB)

08:30 – 11:00 IoT Presentations and Exhibition

12:30 – 13:30 Lunch

13:30 – 14:00 Invited Talk: Gaetano Marrocco, "Recovery/Expanding Human Senses by Bio-integrated Epidermal RFID"

14:00 – 15:30 IoT2: Internet of Things - Software

14:00 – 15:30 Round Table Discussion: RFID in practice

15:30 – 16:00 Coffee Break

16:00 – 17:30 IoT3: Internet of Things - Applications

3. INVITED SPEAKER

INVITED SPEAKER

Thursday, June 28

13:30 -14:00 (Great Hall)

IoT/RFID TRACK



Gaetano Marrocco

Universita' di Roma "Tor Vergata", Italy

Recovery/Expanding Human Senses by Bio-integrated Epidermal RFID

The human skin is a complex and powerful interface between the body processes and the external environment. Skin is provided with receptors to sense material objects and quantify their intrinsic properties like the texture and the temperature. Skin also generates physical signals such as sweat and thermal gradients, that may tell much about the psycho-physical status of a person. But what if the epidermis interface would be augmented with a "second digital skin" suitable to be interconnected to Internet? This talk will address the emerging Epidermal or Skin Radioelectronics, a research trend combining multi-disciplinary expertises such as Material Science, Mechanics, Electronics and Electromagnetics. Recent worldwide published papers demonstrated the feasibility of flexible circuits over thin and bio-compatible conformable membranes for direct placement over the human body. In this scenario, the virtuous synergy of Epidermal Radio-Electronics with the latest research trends in sensor-oriented Radiofrequency Identifications (S-RFID) could boost the applicability of skin technology in the real world, thus providing further stimuli to the rapidly emerging "Internet of the Bodies". Starting from the basics of epidermal antennas and their technology and open challenges, I will show some pioneering medium-range digital radio-skins for measurements and transmission of body parameters like temperature, sweat and respiration rate. Finally, I will introduce the concept of Radiofrequency Finger Augmented Devices (R-FAD) comprising skin sensors for application onto the fingertips and an interconnected on-wrist reading system suitable to artificially replace lost touch senses in impaired people and even to the cognitive remapping of sensorial deafferentations.

Gaetano Marrocco is currently Full Professor of Electromagnetics at the University of Roma Tor Vergata and Chair of the Pervasive Electromagnetics Lab. His research is currently focused to the development of the wireless physical layer of the Medical and Industrial Internet of Things. He pioneered the extension of RFID technology to the batteryless sensing of deformation, temperature, humidity, volatile compounds, implanted bio prosthesis, skin parameters, human motion recognition and restoration of epidermal senses. Associate Editor of IEEE RFID and member of the IEEE AP-S Awards jury. Co-founder and President of the University spin-off RADIO6ENSE which is active in Industry 4.0, Cyber and Physical Security.

4. TECHNICAL PROGRAM

Wednesday, June 27, 13:30 - 15:00

IoT1: Internet of Things - Hardware and Systems (A104)

Chair: Luigi Patrono, University of Salento, Italy

1. Unobtrusive Detection of Home Appliance's Usage for Elderly Monitoring

Jochen Meis (GeoMOBILE, Germany); Luigi Patrono and Piercosimo Rametta (University of Salento, Italy)

2. A Flexible IoT Energy Monitoring Solution

Danielly Avancini and Simion Martins (National Institute of Telecommunications (INATEL), Brazil); Ricardo Rabelo (Federal University of Piauí (UFPI), Brazil); Petar Šolić (University of Split & FESB, Croatia); Joel J. P. C. Rodrigues (National Institute of Telecommunications (Inatel), Brazil & Instituto de Telecomunicações, Portugal)

3. A multi-source energy harvesting sensory glove electronic architecture

Vincenzo Stornelli, Alfiero Leoni and Giuseppe Ferri (University of L'Aquila, Italy); Vito Errico (University of Rome "Tor Vergata", Italy); Mariachiara Ricci and Antonio Pallotti (University of

Rome Tor Vergata, Italy); Giovanni Saggio (University of Tor Vergata, Rome, Italy)

4. A Microservices-based IoT Monitoring System to improve the Safety in Public Buildings

Marina Mongiello (Politecnico di Bari, Italy); Francesco Nocera and Angelo Parchitelli (Politecnico di Bari, Italy); Luigi Patrono and Piercosimo Rametta (University of Salento, Italy); Luca

Riccardi and Leonardo Avena (Politecnico di Bari, Italy)

5. Intelligent application for monitoring the pantograph-catenary contact in electric railway transportation

Stela Rusu-Anghel (Politehnica University of Timisoara, Romania); Manuela Panoiu and Cristian Abrudean (Polytechnic University of Timisoara, Romania)

6. A New VCII Based Low-Power Low-Voltage Front-end for Silicon Photomultipliers

Leonardo Pantoli (University of L'Aquila, Italy); Gianluca Barile and Alfiero Leoni (University of L'Aquila, Italy); Leila Safari (Iran University of Science and Tech (IUST), Iran); Vincenzo Stornelli (University of L'Aquila, Italy)

7. A beam steering transmitter prototype for IoT communications

Giulio D'Amato, Gianfranco Avitabile and Giuseppe Coviello (Politecnico di Bari, Italy); Claudio Talarico (Gonzaga University, USA)

Wednesday, June 27, 15:30 - 17:00

IoT: RFID (A104)

Chair: Luca Catarinucci, University of Salento, Italy

1. RFID Tag localization with UGV in retail applications

Andrea Motroni, Alice Buffi and Paolo Nepa (University of Pisa, Italy); Paolo Tripicchio and Matteo Unetti (Scuola Superiore Sant'Anna, Italy)

2. Reduction of Power-Discretization Effects in UHF RFID Tag Performance Estimation Systems based on Off-the-Shelf Programmable Readers

Riccardo Colella and Luca Catarinucci (University of Salento, Italy)

3. Sensing-oriented RFID tag Response in High Temperature Conditions

Cecilia Occhiuzzi (RADIO6ENSE srl & University of Roma "Tor Vergata", Italy); Sara Amendola (RADIO6ENSE S.r.l.); Simone Nappi (RADIO6ENSE S.r.l. and University of Roma "Tor Vergata"); Nicola D'Uva (RADIO6ENSE srl, Italy); Gaetano Marrocco (RADIO6ENSE S.r.l. and University of Roma "Tor Vergata")

4. Compact In-metal UHF RFID Tag for Manufactured Metallic Components

Vittorio Franchina, Andrea Michel and Paolo Nepa (University of Pisa, Italy); Alfredo Salvatore (Sensor ID, Italy)

5. Application of the Pseudo-BAP mode to a 3D-Printed Wearable UHF RFID Tag with Sensing Capabilities

Riccardo Colella and Luca Catarinucci (University of Salento, Italy)

6. Breath-monitoring by means of Epidermal Temperature RFID Sensors

Cecilia Occhiuzzi (RADIO6ENSE srl & University of Roma "Tor Vergata", Italy); Maria Cristina Caccami (University of Rome "Tor Vergata", Italy); Sara Amendola (RADIO6ENSE S.r.l.); Gaetano Marrocco (RADIO6ENSE S.r.l. and University of Roma "Tor Vergata")

Thursday, June 28, 14:00 - 15:30

IoT2: Internet of Things - Software (A102)

Chair: Luigi Patrono, University of Salento, Italy

1. Context-aware IOT middleware for home care - "R2V adaptive"

Andrei Vasilateanu (Politehnica University of Bucharest, Romania)

2. TACTUS: an intuitive and tangible framework for composing IoT Services

Stefano Pino (Engineering Ingegneria Informatica Spa, Italy); Davide Storelli, Enza Giangreco, Marco Alessi, Alessio Camillò and Marco Pinnella (Engineering Ingegneria Informatica S.p.A., Italy)

3. Accounting for User Diversity in the Design for Sustainable Behaviour in Smart Offices

Ane Irizar-Arrieta, Diego Casado-Mansilla and Aiur Retegi (University of Deusto, Spain)

4. Make users own their data: a decentralized personal data store prototype based on Ethereum and IPFS

Stefano Pino (Engineering Ingegneria Informatica Spa, Italy); Davide Storelli, Alessio Camillò, Enza Giangreco, Marco Alessi and Marco Matera (Engineering Ingegneria Informatica S.p.A., Italy)

5. A Performance Analysis of an IoT-aware Elderly Monitoring System

Aitor Almeida (DeustoTech - Deusto Institute of Technology, Spain); Marina Andrić (BELIT, Serbia); Ruben Mulero (Deusto Tech, Spain); Luigi Patrono and Piercosimo Rametta (University of Salento, Italy); Vladimir D. Urošević (Belgrade University Faculty of Organizational Sciences & Belit Ltd, Belgrade, Serbia)

6. A Proposal for Bridging the Message Queuing Telemetry Transport Protocol to HTTP on IoT Solutions

Mauro Cruz (Instituto Nacional de Telecomunicações, Brazil); Joel J. P. C. Rodrigues (National Institute of Telecommunications (Inatel), Brazil & Instituto de Telecomunicações, Portugal); Ellen Paradello (National Institute of Telecommunications (INATEL), Brazil); Pascal Lorenz

(University of Haute Alsace, France); Petar Šolić (University of Split & FESB, Croatia); Victor Albuquerque (Universidade de Fortaleza-Unifor, Brazil)

7. A Vehicle Driving Adjustment Technique Based on Driving Schedule through the Tunnel in Cyber-physical Running Environment

Min-hwan Ok (Korea Railroad Research Institute, Korea)

Thursday, June 28, 16:00 - 17:30

IoT3: Internet of Things - Applications (A102)

Chair: Luigi Patrono, University of Salento, Italy

1. Timing analysis for IoT-based vehicle-pedestrian collision avoidance for NLOS conditions

Nadezda Yakusheva (University of Udine & Bauman Moscow State University, Italy); Andrey Proletarsky (BMSTU, Russia); Mikhail Basarab (Bauman Moscow State Technical University, Russia)

2. Intelligent Street Light System Based on NB-IoT and Energy-saving Algorithm

Langcheng Zhao (Beijing University of Posts and Telecommunications, P.R. China); Qihong Gao (Beijing University of Posts And Telecommunications, P.R. China); Ran Wang, Nan Fang, Zhuqi Jin, Neng Wan and Lianming Xu (Beijing University of Posts and Telecommunications, P.R. China)

3. Rapid Prototyping of a Star Topology Network based on Bluetooth Low Energy Technology

Lorenzo Invidia (University of Salento, Italy); Silvio Lucio Oliva and Andrea Palmieri (STMicroelectronics, Italy); Luigi Patrono and Piercosimo Rametta (University of Salento, Italy)

4. Real Time System for Measuring the Pantograph Vertically Position Correlated with Temperature and Air Humidity

Caius Panoiu, Raluca Rob and Stela Rusu-Anghel (Politehnica University of Timisoara, Romania)

5. A Comparative Study of Cycling Mobile Applications

Miguel A. Wister, Pablo Pancardo and Pablo Payro Campos (Juarez Autonomous University of Tabasco, Mexico)

5. ROUND TABLE

ROUND TABLE

Thursday, June 28

14:00 - 15:30 (Small Hall)



Petar Šolić

University of Split, Croatia

RFID IN PRACTICE

Radio Frequency Identification (RFID) technology, based on wireless communication between readers and cost effective tags, became the most popular tool for indoor tracking and identification. This technology is still advancing in terms of performances, through improving achievable reading ranges and increasing the probability to be detected while being found in the interrogation range and/or being attached on various materials. The goal of this discussion is to gather experiences of professionals and academia in order to define further investigation goals and experiments to be done in order to determine on how much is RFID advancing through years.

***Biography:** Petar Solic (solic@fesb.hr) received his M.S. and Ph.D. degrees, both in computer science, from the University of Split in 2008 and 2014, respectively. He is currently employed at the Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture (FESB), University of Split, Croatia, as an assistant professor in the Department of Communication and Information Technologies. His research interests include information technologies, and RFID technology and its application. In 2016 he was awarded with National prize for science.*

6. IoT: Presentations and Exhibition

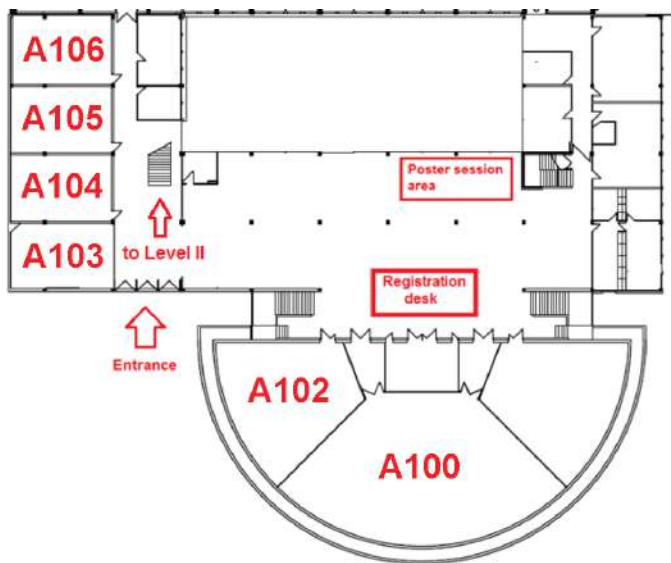
- experience, challenges and evolution -

The main goal of this workshop is to present and discuss recent advances in the area of the Internet of Things, where Radio Frequencies (RF) technologies and embedded systems are becoming research topics more and more interesting for both academia and industry. This symposium will provide an opportunity for scientists, engineers and researchers to discuss new applications, design problems, ideas, solutions, research and development results, experiences and work-in-progress activities in this important technological area. In particular, several ICT companies will be invited in order to report a real vision of the industry on challenges and solutions in the IoT sector. Meeting corners and exhibition session will be organized in cooperation with some companies such as STMicroelectronics, SensorID, SELMET, SofThings, Amplifico, RIMAC, Ericsson, Spica, Plurato, Engineering, Allnet.Italia, RadioSense, Flow Design Team, Geo sustavi, Statim, Canosa.

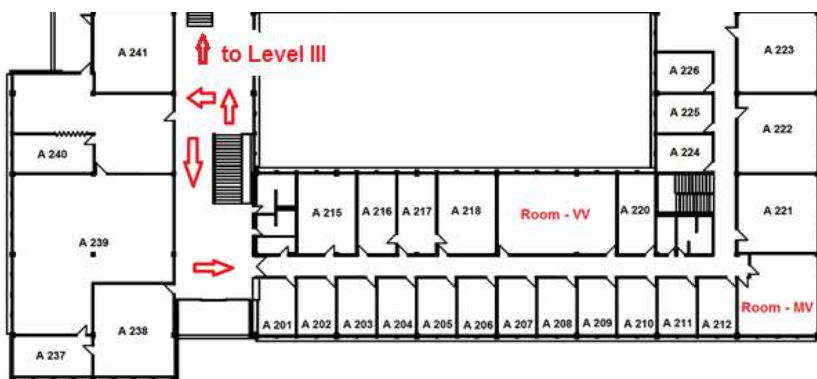


7. MAPS

Level I



Level II



27 - 28 JUNE 2018
UNIVERSITY OF SPLIT
FESB

